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Reducing Inpatient Falls and Falls with Injury

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This doctoral project, directed and approved by the candidate's committee, has been accepted by the College of Graduate and Professional Studies of Abilene Christian University in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

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by

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Abstract

Patient falls are a costly problem for many inpatient hospitals and are exacerbated by poor training of nursing and ancillary staff. The researcher sought to determine if there was a difference in inpatient falls and falls with injury after a hospital facility in the Southwestern United States revised its fall prevention policy, reorganized its fall prevention committee, and provided new interventions for nurses assessing patients for fall risk. In this quantitative, retrospective, comparative project, the researcher reviewed data from 2017–20 related to the facility's redefined fall prevention program, including its new interventions and efforts to involve patients in their own safety and care. The research facility provided information from forms that staff completed after each fall occurred. Results showed fewer falls overall after the fall prevention program was revised and new interventions were introduced. In addition, no serious injuries were reported from inpatient falls in 2019 or 2020—an improvement from 2017–18. However, findings also showed that changes to the fall prevention program did not make a difference in the number of inpatient falls if patients and staff did not comply with the interventions and precautions put in place.

Keywords: falls, inpatient falls, fall prevention, falls with injury

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

When patients are admitted to a hospital, they are taken out of their routine and familiar surroundings. Safety risks increase with illness, medications (see Appendix B), and sleep loss due to weakness and fatigue. During hospitalization, patients may fall due to their illness, medication side effects, unfamiliar surroundings, or mechanical obstructions.

The World Health Organization (2021) defined a fall as "an event which results in a person coming to rest inadvertently on the ground or floor or other lower-level" (p. 1). Similarly, the research facility in this study defined a fall as "an unplanned descent from one surface to another with or without injury to the patient." The Agency for Healthcare Research and Quality (AHRQ, 2019) stated that every year approximately 700,000–1,000,000 people fall while in the hospital. Research indicates that at least one-third of these falls could have been prevented had the facility managed the patient's risk factors and had a robust fall prevention program (AHRQ, 2019). To have a successful program, hospitals must effectively coordinate all disciplines, including assessing the organizational culture and past practices.

Falls are not a new phenomenon in health care. While the goal is zero harm from any falls that occur during an inpatient stay, sometimes falls with injury still occur. The risk of an inpatient experiencing a fall is higher when an individual has acute or chronic health issues requiring hospitalization. According to the Joint Commission (2015), patients who fall while in the hospital setting have a 30%–50% chance of sustaining an injury. In addition, when a patient falls, the results may require an extended hospital stay and additional resources and treatment. Therefore, preventing falls with injury benefits not only the patients but the facility as well.

Reimbursement for hospitals is tied to performance improvement programs and patient safety indicators. This means hospital payment is reduced for falls with injury, which are

reported as healthcare-acquired conditions. A successful fall prevention program, if utilized as designed, can help minimize inpatient falls and possibly eliminate falls with injury.

PICO Question

The problems (P) studied were inpatient falls and falls with injury. The clinical (PICO) question was, "Is there a difference in the number of inpatient falls and falls with injury when comparing the data from the standard (I) fall prevention bundle (2017, 2018; C) versus data from the new fall prevention bundle (2019, 2020)?" Interventions included policy revision, committee reorganization, and nursing interventions for patients at risk for falls. I compared the data for inpatient falls from 2017 and 2018 to data from 2019 and 2020 using a retrospective postintervention study. The main topic was the correlation between the implementation of a new fall program and improved patient outcomes.

Hypotheses

I hypothesized that implementing a new fall prevention policy and creating a new fall prevention committee would decrease inpatient falls experienced in one facility by at least 10%. To successfully implement a new approach to fall prevention, policy changes must be merged into a unit's daily activities. This ensures changes are sustained and become part of the culture. AHRQ (2019) noted, "To sustain improvement, changes need to become so integrated into existing organizational structures and routines that they are no longer noticed as separate from business as usual" (p. 81). The null hypothesis was the following: There is no significant difference in the number of patient falls after implementation of fall interventions.

The purpose of this quantitative, retrospective, comparative project was to determine if inpatient fall rates changed at the facility under investigation. I accomplished this by reviewing

the data from a fall prevention program that was redesigned with new interventions and efforts to involve patients in their own care and safety.

Background

According to the Centers for Disease Control and Prevention (CDC, 2019), the cost per year for nonfatal falls among adults over 65 was approximately $29 billion paid by Medicare, $12 billion in private pay, and $9 billion spent by Medicaid. The most common injuries resulting from a fall are hip fractures, followed by head injuries, shoulder injuries, and sprains. Hospitals are not reimbursed by insurance or Medicare for treatment related to falls in a facility. They are also not compensated for any extended length of stay resulting from a fall in the facility.

Organization Information

This research facility is a 103-bed rural acute care hospital with more than 31 specialties located in the Southwestern United States. It provides inpatient, outpatient, and emergency services and is accredited by the Joint Commission for its hospital, laboratory, and primary stroke center. The facility has over 600 employees with more than 250 contracted employees, including emergency, hospitalist, and surgical physicians. The facility is the only hospital in a county of 142,878 people (United States Census Bureau, n.d.).

In October 2017, the research facility underwent many system changes and incurred staff turnover and unexpected layoffs. During this time, the facility saw increased patient falls and falls with injury that may have resulted from staff being preoccupied with system changes and paying less attention to patient needs. The facility reported 108 falls in 2017 and 66 falls in 2018.

Organizational Factors Contributing to Falls

For the project facility, factors contributing to falls appeared to include noncompliance of nursing staff with fall precautions for patients and postmerger policies, as well as patient and

family noncompliance with fall precautions due to lack of understanding of the reasons for the precautions. Staff also appeared to be distracted by implementing new electronic health records (EHRs), recent employee turnovers, and new policies and procedures implemented throughout the facility.

On August 14, 2018, the facility changed from a Windows-based EHR system to a system that was several years older and based on an outdated technology platform that many staff members had never used. Staff education on the system was poorly structured and planned in the eyes of end users. The facility reported 26 inpatient falls between January and July 2018. From August to December 2018, 40 additional inpatient falls occurred, resulting in six fractures and extended lengths of stay. The injuries included three hip fractures, one pelvic fracture, one lumbar fracture, and one fracture of the first metacarpal. An article published by Johns Hopkins Medicine (2015) indicated that inpatient hospitals see an average cost of approximately $34,294 for a fall injury. This means the cost of the three hip fractures alone would be roughly $102,882 to repair. Added to that, the cost of rehabilitation would be approximately $12,000, totaling roughly $114,882. This calculation is based on a finding of the American Academy of Orthopedic Surgeons (AAOS, 2018) that “nursing home care costs a little over $200 per day or more than $70,000 per year” (p. 4). The pelvic fracture and lumbar fracture were nonsurgical and did not increase the patient’s length of stay. The patients were already planning to go to rehab, so the facility was not charged for these injuries. The metacarpal fracture cost approximately $2,226 to repair. The surgeon did not charge for the follow-up care, but this could have cost up to $1,147 (Steve et al., 2019). Other injuries included one dislocation of a shoulder and one laceration of the eye.

A comparison of the total number of patients admitted to the facility for 2018 (37,419) with the total number of falls and falls with injury (66) yields a fall rate percentage of 1.76%. Although this seems like a very low figure, the Joint Commission (2017) set a target of zero falls with zero injuries in acute care settings. The research facility in this study acknowledged awareness of the zero-falls preference but recognized this as a lofty goal. While it may be impossible to prevent all falls, hospitals can prevent 100% of injuries.

One recurring theme among patient falls in the facility involved issues with the bed alarm. The alarm is intended to alert the staff that a patient's weight has shifted enough to signal the patient is attempting to get up without assistance. Although all falls that resulted in fractures involved patients considered at high fall risk, only two had a bed alarm in place that sounded before the fall. In addition, nursing leaders at the facility interviewed the staff involved and found that two of the patients had bed alarms activated by staff but later turned off by family or the patient.

Facility leaders announced an acquisition of the facility in June 2017, with completion on October 1, 2017. A review began in late October 2017 by the new corporate leaders to determine the protocols and policies currently in place at the facility. The new leaders put new policies in place and retired other policies that were not in line with those of the parent company. If a new policy was not available, current facility policies were maintained. Leaders affixed the new corporate logo to these policies and then sent them through the necessary committees to affirm until the parent company could offer guidance. Ultimately, modifications were made to ensure the new policies aligned with the facility's capabilities.

A root cause analysis was completed on each of the falls with injury, and there appeared to be no common cause for the increase in falls with injury. One patient was a 67-year-old

female who experienced alcohol withdrawal and delirium. Another was a patient with Down syndrome who became frightened and fell when getting out of the shower. A 79-year-old male experiencing a recent mental status change was standing next to the bed and fell just as the nurse reached for him. Two other patients were being assisted in the bathroom, and when they stood up to be cleaned by staff, they fell back onto the toilet, sustaining a hip fracture. None of these occurred on the same day of the week, at the same time of day, or with the same staff members. Fall precautions were in place for four patients but were not properly in place for two of the patients.

I posed the question: What common threads for the facility can be found? The acquisition of the hospital by a competing corporation involved rebranding, layoffs, changes in staff positions, pay structure, and management changes. Staff had to learn to use a new computer system and deal with a different set of expectations. The purchase of the facility occurred on October 1, 2017, and many of the departmental layoffs occurred in March and April 2018. On August 14, 2018, the hospital put in place a new EHR system that was, technologically speaking, several years behind the hospital's previous system. Falls with injury continued to occur after August 14, 2018. While no factual evidence supports the idea that the new EHR system contributed to the falls, extenuating circumstances were noted.

The inpatient units at the research facility were the first to receive training on the new system. They received hands-on virtual training and concurrent charting during the implementation period. At the same time, they also received training on a new initiative of the parent corporation: evidence-based clinical documentation (EBCD). Given the stress that the acquisition caused for frontline staff and the poorly conducted training the corporate office

provided for the EBCD rollout, patients were caught in the middle. The staff were confused about documentation and had difficulty locating sections of the chart to address.

The added distraction of a new system decreased fall precaution compliance and ultimately increased the risk for patient falls. The 40 falls from August to December 2018 were almost double those during the first seven months of the year. Staff appeared to be focused on the changes and how those changes would affect them rather than on their patients. There were fewer documented discussions with patients regarding their risk for falls and less compliance with incorporating fall precautions. This inattention may have indirectly contributed to the patient falls with injury.

Perceived Need for the Hospital

Changing ownership includes more than simply changing the name of the facility. First, a gap analysis must be performed to determine what staff are in place and what staff are still needed for each unit. Next, a review should be completed to determine what tasks are being performed by each staff member and if they are appropriate. Finally, a list of employees and their titles, duties, pay rate, tenure, and certifications must be reviewed.

In addition, current staff policies must be reviewed and analyzed. New approaches must be implemented with the team having a clear understanding of any expected changes. Implementation of those changes must be precise and controlled without interruption of workflow. Due to the new computer system, staff uncertainty about their employment status, departmental layoffs, and rearranging of staff positions, frontline staff appeared to lose focus of their primary goal: caring for patients.

Patients and families must feel safe when they are admitted to a hospital. They must know that staff have taken steps to ensure they leave the facility in an improved condition rather

than a diminished one. The elderly population is aware that falls increase as health conditions weaken the body's muscles. In a study published by the *Journal of Aging Research*, researchers noted that when they surveyed 101 older adults, "almost one-half had sustained a fall in the past 12 months, and almost three-quarters (73%) limited their activity due to fear of falling. Two-thirds (65%) reported balance/mobility problems" (Laing et al., 2011, p. 5). There is a constant battle between the need for independence and the need for safety.

To strengthen the fall prevention program, the existing platform must be reviewed. For this study, I compared fall data preintervention (2017–2018) to fall data postintervention (2019–2020). In 2018, there were 66 inpatient falls, resulting in a 1.76% fall rate (number of falls divided by adjusted hospital patient days, multiplied by 1,000). Of these falls, 10 occurred in March. In 2019 the facility saw a decrease in inpatient falls: There were 53 falls and a fall rate of 1.46% (Table 1). By redeveloping the facility's fall prevention committee, introducing additional actions, and establishing new requirements, leadership can help staff reset their focus on patient safety and care to further reduce falls and falls with injury.

For this study, I compared the data to determine if there were fewer postintervention falls and falls with injury for the years 2019 and 2020 compared to preintervention falls and falls with injury in 2017 and 2018. In 2019 the fall prevention committee and a new fall policy were implemented with education for staff. Fall committee meetings included a discussion surrounding any falls that occurred and an invitation to the primary nurse caring for the patient at the time of the fall. This allowed discussion about the nurse's determination of factors that contributed to the patient's fall, what could have been done differently, and how staff might change their practices. In addition, the facility implemented new cables that attached patient beds

directly to the call light system. This meant staff would immediately recognize when and where a bed alarm was sounding, allowing them to respond more quickly.

Table 1

Facility Inpatient Fall Data for 2017, 2018, and 2019

Month	2017	2018	2019
January	7	9	3
February	11	0	6
March	11	1	3
April	13	4	7
May	2	5	3
June	12	4	5
July	11	3	4
August	13	13	5
September	8	8	2
October	9	7	7
November	3	9	5
December	11	3	3
Total falls	99	66	53
Fall rate	2.44%	1.76%	1.46%

Note. Information obtained from the research facility's patient safety committee meeting reports.

In addition, it became mandatory for patients assessed as a fall risk to have a chair alarm so that staff would be alerted if the patient attempted to stand on their own. This intervention was added to the current practice of hourly rounding with a focus on bathroom assistance. The policy stated that when a patient at risk for falls is escorted to the bathroom, the patient should not be left alone. The intention is to provide the patient the freedom to get out of bed with assistance so bathroom urgency is not prompting individual ambulation.

Intervention

The facility participates in the Survey on Patient Safety Culture through AHRQ every two years. This survey allows the facility to use staff perceptions on patient safety to determine where staff feel the hospital could improve. The last time the facility took the survey was in

February 2018. This is significant because a few months after the survey was taken, patient falls with serious injury increased in the facility. The data gleaned from the 2018 survey revealed that staff had the following impressions of patient safety in the facility:

1. There were not enough staff to handle the workload.
2. Staff lost track of priorities when transferring patients from one unit to another.
3. Hospital units do not coordinate well with each other.
4. Problems often occur during the exchange of information across hospital units.
5. Staff worry that mistakes they make will be kept in their personnel file (AHRQ, 2018).

When this information was received, the administrators of the facility developed an action plan to address these areas of concern as follows:

1. Conduct a staffing efficiency audit to determine areas of need for additional personnel.
2. Obtain electronic verification from each unit staff member when handing off a patient to ensure that staff members give and receive the necessary information about the patient.
3. Hold daily meetings with hospitalists, inpatient directors, the emergency department (ED) director, the operating room (OR) director, and the environmental services (EVS) director to determine what discharges will occur, bed availability, anticipated bed needs, and turnaround times for cleaning rooms.
4. Provide a standardized situation, background, assessment, recommendation (SBAR) for giving and receiving information regarding patients.

5. Provide a policy to staff showing expectations regarding occurrence reports, investigations, and nonpunitive information-gathering meetings. (AHRQ, 2018)

While some action plan elements have been completed, others are still in progress. The staffing efficiency audit showed no deficiencies but allowed staff to see they needed another nurse; however, they received a patient care technician. Staff members had a choice: They could have another clinical nurse or the patient care technician. Each unit received the opportunity to provide their feelings anonymously and then chose to keep the patient care technician as part of its staffing grid.

The facility also implemented electronic verification from each staff member in conjunction with a standardized SBAR across the hospital. Each unit completed an anonymous follow-up survey conducted via SurveyMonkey. Results indicated that staff felt the flow of information was much more concise and consistent with the new methods.

The daily meeting involving hospitalists, inpatient directors, the ED director, the OR director, and the EVS director was evaluated for effectiveness on November 1, 2019. The purpose of the meeting was to determine why patients were still at the facility, the interventions being utilized, their plan for discharge, and their current health status. Also included in the information was the patient's safety, including fall acuity status, mentation, and security compliance.

The facility dismantled its fall prevention committee in January 2019. The new committee included frontline staff from every department rather than the department's directors. The newly formed committee listed items committee members would like to see on the agenda for each meeting. The old agenda provided information regarding the number of falls, what the patient was doing when they fell, and what interventions were in place. The new agenda

provided information regarding bed safety, such as the implementation of cables that attach the patient's bed alarm to the call system so that the staff are aware of the location of the bed alarm for quicker response. Other information included how often bed alarms were not used when a fall occurred. The issue can be addressed directly with the staff member to see if it was an oversight or an educational or refusal issue.

The new agenda included bed alarm education to staff provided by representatives from the company providing the inpatient beds. Staff completed an in-service training on each bed type and how the bed alarms work on each one. While this education was provided when the beds were purchased, facility leaders felt that ongoing education would help since the staff changes and agency nurses come in as well. The representative was also asked to provide step-by-step instructions on each bed, how the bed alarms are set and disarmed, and how the sensitivity can be adjusted.

Another intervention is a "Falls Friday" meeting comprising members of the fall prevention committee. If a fall occurs in the hospital, the committee will meet with the staff members involved in the patient's care at the time of the fall. This nonpunitive meeting is meant to discuss the issues surrounding the fall, such as patient education, patient or nursing compliance with bed alarms, ancillary staff failing to notify nursing staff that the patient had returned from a test, or family members assisting the patient instead of calling staff members for assistance. Nurses who forget to educate the patient, who are too busy to answer the bed alarm soon enough, or who experience some other factor contributing to the fall, receive options they may not have thought of previously. They are also asked to give feedback on what may have contributed to the fall and what tools were not available to them that they could have used.

The fall prevention committee was tasked with finding the best educational tools for patients. Any materials the committee identifies as useful are adapted for use in the facility and added to the admissions folder. The goal is to educate staff who complete admissions on broaching the subject of a patient being at risk for falls. This conversation is meant to open the dialogue so that nursing staff can educate patients on different hazards present in the hospital, such as the effects of medications (see Appendix B). This allows the patient to ask about falls and precautions, which could improve patient compliance with calling for assistance when getting up and letting nurses know about any needs during their hourly rounding.

EHRs present an additional opportunity for change. Currently, the fall assessment in the EHR consists of a question: "Is this patient a fall risk?" That question is not a proper fall assessment. Although questions in other areas of the nursing assessment address previous falls and medications the patient has taken, they do not determine whether the patient is a fall risk. It is left to the nurse's judgment. This is not a consistent way to determine fall risk, but changes cannot be made at the facility level. Instead, there must be a request to the corporate office supported by peer-reviewed documentation to show why this change would benefit patients.

Another complication is education of nursing staff about the seriousness of patient safety. This is sometimes taken for granted or its importance minimized. A corporate malpractice attorney presented to staff the importance of documentation and fall precautions. The hope was that this engaging presentation would renew nurses' commitment to providing excellent care to patients each day.

Significance of Change

The primary goal of remaking the fall prevention program was patient safety. Patients benefit from safe, compassionate, reliable care. When patient outcomes consistently improve, the

community has more faith in the hospital. This benefits not only the facility but the organization as well. The CDC (2019) reported, “Each year about $50 billion is spent on medical costs related to non-fatal fall injuries and $754 million is spent related to fatal falls” (para. 1). As successful measures are put in place to eliminate falls in one hospital, sister facilities can adopt the same measures and make a significant impact on the corporation’s financial well-being.

Medicare has value-based programs that compensate providers with incentive payments for providing quality care to patients. The reasoning behind the performance-based payment model is that better, safer care for patients will result in better, safer care for the community and higher reimbursement for the hospital. This forces acute care hospitals to focus on quality instead of quantity when providing care. Hospitals with continued poor outcomes will not receive reimbursement for their services from the Centers for Medicare and Medicaid Services (CMS, 2019).

As nurses adopt a more streamlined, consistent approach to caring for patients, hospital administrators would likely see more positive patient outcomes and patients placing more trust in the facility. The result—more positive reviews shared on social media and more faith in hospital staff. This also benefits the organization as other facilities begin to adopt the steps from the revamped fall prevention program, which would likely change the way the staff think and feel about patient safety.

As nursing staff settles into their new corporation and the changes from the fall prevention program, they would likely embrace these new behaviors as a routine practice. Moreover, when newly graduated nursing staff are hired at the facility, the new approaches would not be novel to them; they would accept these routines as part of their defined role.

Although new staff would adapt more quickly to the changes than tenured staff, the changes would soon become second nature.

As these practices become ingrained, hospital leadership would have renewed faith in their staff to ensure patient safety. They could report to division- and corporate-level leaders what improvements had been made, how the changes had improved patient care, and what they mean for the hospital's bottom line. Patients leave the hospital in a better, not worse, state than when they arrived. When this expectation is met, the hospital is performing as expected. Leaders would see a change in the online reviews patients and their families leave. This could improve perceptions of the facility throughout the community and offer a reason for the city to be proud of its hospital. When the community has more faith in the facility, patients would no longer have to travel into the metroplex to obtain health care. Revenue would increase, and the hospital could continue to grow and add more service lines. This creates a circle of reactions that attract more patients, all by improving patient safety and ensuring patients do not suffer injuries if they fall in the facility. The result is the organization maintains the reputation that no matter which of its facilities patients enter, the standard of safety and care is always the same. Excellence is provided to every patient in every action, every time.

Summary

To determine if a change has been implemented, researchers must review the interventions put in place. Therefore, I collected data to determine if fall alarms were activated either on the bed or while patients at risk for falls were sitting up in a chair. I completed daily rounds to determine if beds were attached to the nurse call system. I also checked the charts of patients at risk for falls to see if the contract (see Appendix D) with the patient/family had been signed. This told me whether staff initiated the conversation upon admission. I also made rounds

to determine if the fall identification items were put in place, such as yellow fall bracelets, yellow nonskid socks, and signage placed outside patients' doors. In addition, I randomly took attendance at the daily shift safety huddles and checked bedside shift reports to determine if nurses were relaying information related to patients at risk for falls to the next shift.

Operational Definitions

Accreditation. Accreditation is a form of quality control ensuring specific standards are met and maintained (The Joint Commission, 2020).

Acquisitions. Acquisitions are a change of ownership transaction, a transaction involving a "change of information" and requiring a new Medicare enrollment (Thallner, 2016, para. 2).

Assessment (nursing). A nursing assessment involves the systematic collection of all data and information relevant to the care of patients, their problems, and needs (Miller-Keane & O'Toole, 2003).

Audit. An audit is a process health professionals use to assess, evaluate, and improve the care of patients in a systematic way (Harding, 2019).

Centers for Disease Control and Prevention. The CDC is a U.S. federal agency housed under the Department of Health and Human Services responsible for tracking and controlling the spread of infectious diseases (CDC, 2020).

Centers for Medicaid and Medicare. The CMS is a U.S. federal agency housed under the Department of Health and Human Services. This agency regulates health care programs across the United States (CMS, 2019).

Fall. A fall is an unplanned descent from one surface to another with or without injury (AHRQ, 2019).

Initiative. Initiative is an action taken to improve a situation or prevent a problem from occurring (Institute for Healthcare Improvement, 2019).

Inpatient. An inpatient is a person who remains in the hospital while receiving treatment (Miller-Keane & O'Toole, 2003).

Intervention. An intervention is an act by an individual or entity to improve the health or safety of a patient or client (Miller-Keane & O'Toole, 2003).

Joint Commission. The Joint Commission is an independent organization that provides accreditation to health care facilities to recognize specific performance standards (Joint Commission (2020).

Length of stay. Length of stay is the length of time a patient is admitted to the hospital during a single visit (Miller-Keane & O'Toole, 2003).

Outcomes. Outcomes are the positive or negative result of interventions completed on behalf of a patient (AHRQ, 2018).

Press Ganey. Press Ganey partners with clients across the continuum of care to create and sustain a high-performance environment to ultimately improve the patient experience (Press Ganey, 2020).

Chapter 2: Literature Review

I conducted the literature review on studies and articles from 2014 to 2019 regarding hospital inpatient falls and prevention. The purpose of the literature review was to identify gaps at the research facility and identify evidence of successful interventions to reduce falls in acute care hospitals. Some articles fell outside those parameters but had enough information to warrant inclusion in the review. The literature review was not restricted to the United States. The search was focused on methods and components of interventions proven to reduce or eliminate inpatient falls.

The emphasis of the literature review was on approaches or interventions that provided results, were easy to implement, and were not solely the responsibility of the primary care nurse. I attempted to separate interventions that worked from those that did not work and determine why they did or did not work. Where possible, I have identified challenges and barriers to successful implementation of a program.

I found many articles on patient falls, prevention of falls, and incorporating a new fall program in a facility. Fewer articles addressed the increase or decrease in falls for inpatients during an acquisition or significant system change process. I found much information on risks and benefits related to hospital acquisitions and divestitures but little on the effect on hospital staff or patient care. Of the results I found on divesture and acquisition, many were not peer-reviewed.

The literature review included a matched case-control study (Severo et al., 2018) using quantitative data collected over 18 months. The researchers used descriptive statistics and conditional logistic regression incorporating Microsoft Excel and SPSS Version 18.0 to analyze the data. The results showed contributors to increased risk for falls included

disorientation/confusion, frequent urination, walking limitations, absence of a caregiver, postoperative confusion, and number of medications administered within a 72-hour period.

Tsai et al. (2014) conducted a retrospective survey study using fall-related data from patients 65 or older and calculated percentages, variances, and logistic regressions. The results revealed falls with injury had a severe and negative impact on elderly patients and reduced their quality of life. The researchers concluded that nursing staff should initiate fall prevention measures upon admission and reinforce them throughout the patient's stay. In addition, they identified the consequences of fall prevention, how nurses and patients receive messages about fall prevention, and the unintended negative feelings among staff and some patients when fall prevention is used (Tsai et al., 2014).

Aarons et al. (2015) completed a quantitative and qualitative analysis to determine the feasibility, acceptability, and perceived use of implementing evidence-based practice. The researchers identified the Leadership and Organizational Change for Implementation (LOCI) as a tool to effectively implement changes to programs that are not working in facilities or need improvement. In addition, the researchers determined specific ways to implement changes to ensure they are successful and remain after the implementation period.

The Joint Commission (2015) used the robust process improvement method for preventing patient falls to incorporate changes in seven participating hospitals. Using the methodology requires the organization to measure and analyze the factors contributing to falls and identify the best solutions across all seven facilities. The study's authors identified factors to successfully decrease falls based on leadership support in implementing changes. This means providing verbal and financial support for any interventions to be successful, including changing processes or protocols that may help prevent falls.

I categorized the material using the PICOT standard, the theoretical framework, and any employed instrumentation. I examined components of existing studies that helped identify patients at high risk for falling to address factors that can be modified to prevent falls. I also attempted to identify situations that make an inpatient more likely to fall and examined interventions that either succeeded or failed to prevent a fall.

I expanded the list of search terms as I began evaluating the results for appropriateness for inclusion. The initial search terms included the following:

- *the aftereffects of a hospital being sold*
- *how patients and staff are affected when another corporation acquires a hospital*
- *staff responses to the facility being sold to another corporation*
- *how being sold can affect a facility's morale, performance, and patient outcomes*
- *corporate changes and the effects on health care*
- *hospital acquisitions*
- *inpatient falls*
- *inpatient falls with injury*
- *prevention of inpatient falls*
- *fall prevention*
- *hospital system changes*
- *staff turnover after acquisition/divestiture*

The databases included in the search were PubMed, HubMed, OMICS, MedlinePlus, and EBSCO, with PubMed and HubMed being the most effective in producing studies and articles. Initially, through PubMed, I found 3,749 articles with the keywords *fall*, *prevention*, and *hospital.* To narrow the search, I included the term *inpatient*. I reduced the results to 468. I then

changed my search to *inpatient falls with injury prevention*, which significantly narrowed the results to 219.

I conducted another search through MedlinePlus using similar terms, producing 305 peer-reviewed articles. When I narrowed the search to include studies only, I found 13 results. When I further restricted the field to limit the publishing date to the past five years, the results fell to five on MedlinePlus and zero on PubMed.

Population

The literature review revealed that many adverse events inpatients experience are related to falls. Many patients view experiencing a fall as the catalyst to events that ultimately take away their independence. In conducting the review, I asked the question, "What factors influence inpatients being at higher risk for falls?" to find the population at higher risk for falls.

Table 2 provides information regarding intrinsic and extrinsic risk factors for falling and whether these factors increase the probability of injury or predict a predisposition to falling. Such risk factors include having a history of falls, gait/balance issues, certain medications (see Appendix B), impaired cognitive ability, and postural hypotension and urgency. This list is not comprehensive but nevertheless can help identify patients who could sustain a fall and injury from a fall.

Table 2

Risk Factors for Falls

Risk factor	Intrinsic or extrinsic	Increases the probability of injury with a fall?[a]	Predicts predisposition to fall?[b]
History of fall	Intrinsic	Yes, primarily if injury occurred previously	Yes
Gait/balance issues	Intrinsic	Yes	Yes
Medications	Intrinsic and extrinsic	Yes, especially psychoactive, blood pressure, and diabetic	Yes
Lighting	Extrinsic	Yes	–
Age	Intrinsic	Yes, but not a specific age	–
Gender	Intrinsic	Not clearly noted	–
Visual impairment	Intrinsic	Not clearly noted	–
Cognitive ability	Intrinsic	Yes	Yes
New environment	Extrinsic	Not clearly noted	–
Uneven surfaces	Extrinsic	Not clearly noted	–
Muscle weakness	Intrinsic	Not clearly noted	–
Postural hypotension	Intrinsic	Yes	Yes
Chronic conditions	Intrinsic	Not clearly noted	–
Fear of falling	Intrinsic	Not clearly noted	–
Improper use of assistive device	Intrinsic and extrinsic	Not clearly noted	–
Distraction	Intrinsic	Not clearly noted	–
Urgency	Intrinsic	Yes	Yes

Note. I developed this table to indicate risk factors for patients who are hospitalized and may be at risk for falls.

[a]Multiple researchers noted these factors but did not specifically test them. "Not clearly noted" means no firsthand evidence was collected to positively test this factor, not that the factor cannot result in a fall with injury.

[b]These factors were found to be accurate in studies that took multiple risk factors into account to determine what puts patients at high risk of falls.

Being admitted to a hospital, which introduces an unfamiliar environment, is a fall risk. When certain medications (see Appendix B) are added and the patient's current health status is considered, the risk for falls may increase. Age is not a factor in whether an inpatient could fall. While researching the topic of inpatient falls, Chu (2017) noted that many falls in the hospital are not witnessed and may not be associated with injury when they occur. For this study, I consider the population at higher risk for falls to be patients age 18 or older admitted to an inpatient facility.

Intervention

During the literature review, I noted that assessment of patients to determine their level of risk for falls is the first step in identifying interventions that can mitigate falls. Assessing patients at risk for falls provides information that allows for individualized care plan development. Crucial risk factors include a history of falls, mobility issues, assistive devices, medications, mental status, toileting needs, intravenous (IV) equipment, vision issues, and orthostatic hypotension possibilities. Patient compliance with interventions is not typically considered a risk factor. To help with compliance, discussions with patients should include why they are considered at risk for falls and why the interventions have been implemented.

The two assessment tools most studied and used are the Morse Fall Scale and the STRATIFY tool. The Morse Fall Scale consists of six subscales (History of Falls, Less Important Diagnosis, Ambulatory Support, IV Access, Step, and Mental Status). The STRATIFY tool contains five subscales regarding a patient's transferability/movement, history of falls, vision, anxiety, and toileting (AHRQ, 2018). Hospitals use many different tools to determine if patients are at risk for falls; some facilities have developed their own. The essential factor in determining inpatients' risk for falls is properly implementing interventions to diminish the risk.

The literature further recommends universal fall precautions, which are interventions implemented regardless of the risk for falls. These interventions are centered on the need to keep the patient safe while in the hospital. AHRQ (2018) provided a general list of universal precautions to implement for all, including the following:

- Orient patients to their environment, including bathroom, bed controls, and call light.
- Place call light and frequently needed objects within reach of the patient.
- Instruct patient to call for assistance.
- Use properly fitting nonskid footwear or socks.
- Keep floors free of obstacles, clean, and dry.
- Keep the bed in the lowest position.
- Engage brakes on beds, stretchers, and wheelchairs.
- Provide adequate lighting for the environment.
- Provide education on fall prevention and safety measures.

For the patient not considered at high risk for falls, these interventions, when consistently implemented, prevent accidental falls due to tripping or slipping when ambulating.

Additional fall prevention interventions should be implemented for patients considered at high fall risk. While these interventions may not prevent a fall, they can prevent serious injury if a fall occurs. *American Nurse Today* published an article with a chart nurses can use to tailor interventions based on patient fall risk assessments (Dykes et al., 2018). These interventions are not comprehensive but a sample of what could be implemented if a patient is at risk of falling as an inpatient. The goal of implementing patient safety practices is to protect patients while they receive the facility's services. Fall prevention practices are an example of efforts to keep patients safe from harm.

Comparison

CMS (2020) defined fall rate as "all documented falls, with or without injury . . . reported as Total Falls per 1,000 Patient Days." Hospital Compare is a Medicare.gov website (CDC, 2020) that provides information on the standard of care hospitals provide patients. This site offers the overall rating and patient survey rating regarding patients' experience in the hospital, which includes a safety rating. In this study, I compared data from patient falls reported in 2017 and 2018 and those reported in 2019 and 2020. Fall prevention improvement is an ongoing process, but there must be a baseline for comparison.

Cuttler et al. (2017) evaluated the effectiveness of patient education videos and adding fall prevention visual signaling icons to bed exit alarms (see Appendix A). The outcome measures included the incident rate per 1,000 patient days for patient falls and falls with a serious injury. The results indicated a 20% decrease in inpatient falls, from 4.78 to 3.80 per 1,000 patient days; falls with injury decreased by 40%, and falls with serious injury decreased from 0.159 to 0.023, an 85% decrease (Cuttler et al., 2017). The conclusion was that patient education and continued use of bed exit alarms can decrease patient falls and falls with injury when implemented.

Cameron et al. (2018) studied 100 patients with dementia between two hospital systems (see Appendix A). They collected baseline characteristics and fall data throughout each patient's length of stay in the hospital facility. Using the plan-do-study-act methodology, there was no significant difference between the two facilities concerning age, sex, activities of daily living, pharmaceutical usage, and assistive needs. In addition, there was no noteworthy difference between the time of admission and the time to first fall between the two facilities.

Knight and Singh (2016) compared falls in private single-patient rooms with those in traditional semiprivate rooms. The findings revealed 16 patients in single rooms sustained 53 falls compared with 23 falls by 15 patients in semiprivate rooms (see Appendix A). The mean for falls among patients treated in single rooms was 3.3 (range 1–9), which was significantly higher than for patients treated in multioccupancy rooms (M = 1.5, range 1–3, p = .03). Researchers concluded there was no difference in injury for patients who fall in semiprivate or private rooms.

Currently, fall rates are monitored as falls per 1,000 occupied bed days or adjusted patient days. The number of falls each month is divided by the number of adjusted patient days and multiplied by 1,000 to determine the fall rate for that month. To do this, the definition of a "fall" must be agreed upon. Along with the supervising corporation, the research facility defined a fall as "an unplanned descent from one surface to another with or without injury to the patient." Intentional falls, or falls that a patient intentionally allowed, were not included in the fall rate. For example, a patient who does not want to be discharged may call the nurse to report a fall, but if there is no evidence to support the claim, it is not included in the fall data.

Outcome

The research facility's goal was to reduce falls between the periods of 2017–2018 and 2019–2020.

Time

The comparison time frame was quarter over quarter and year over year for 2017– 20. The data assisted in determining if the interventions improved the number of falls and falls with injury. The comparison compared preintervention fall data from 2017 and 2018 to postintervention data from 2019 and 2020. The data were reviewed in 2021 to determine if fewer

falls occurred in 2019 and 2020 after the fall prevention program changes had been implemented.

Theoretical Framework

Dr. Betty Neuman developed a framework based on her experience, education, and observations. The design encourages caregivers to incorporate physical, mental, and spiritual healing for patients and consider the patient's environment and where they intend to go when developing a care plan. Neuman's systems framework is an approach to health care in which each patient is unique and has multiple stressors that contribute to their well-being.

Neuman's systems framework comprises the use of primary, secondary, and tertiary nursing prevention interventions for the maintenance of patient wellness as follows (Anderson, 2016):

1. Primary prevention is applied in patient assessment and intervention to identify and reduce possible or actual risk factors.
2. Secondary prevention relates to symptomatology following a reaction to stressors, appropriate intervention priorities, and treatment to reduce their harmful effects.
3. Tertiary prevention relates to adjusted processes taking place as reconstitution begins and maintenance factors move them back in a cycle toward primary prevention.

Neuman's systems framework encourages interdisciplinary health care approaches, including health promotion, maintenance, prevention, and management. The patient is viewed as a system that interacts with internal and external environmental factors and seeks to maintain a positive balance as the environment affects health and wellness. Johnson (1989) suggested the elements to ensure total system health include the well-being of a patient's physiological, psychological, sociocultural, developmental, and spiritual factors.

While the model has been widely acknowledged as pertinent to those with learning disabilities, it is relevant to falls with injury in the acute care setting of a single facility. The facility in this study noted an increase in falls and falls with injury for inpatients associated with system changes, layoffs, and staff turnover following the change in ownership of the facility. The changes made in the facility were significant because the increase in patient falls and falls with injury could be directly tied to the EHR changes and the staff's reaction to those changes. Root cause investigations revealed the only common factors among patient falls with injury were the extenuating circumstances surrounding the acquisition of the facility by another corporation.

Application

Neuman's theory can be applied to the staff's psychological, sociocultural, and spiritual well-being in the facility. As these factors change, patients receiving care are also affected physiologically and developmentally. When staff become preoccupied with external factors surrounding their livelihood, this subsequently affects their diligence and the oversight they provide to patients. The outcomes are not beneficial for patients. Neuman's systems model framework can be applied in this study because it is flexible, allows for actual or potential environmental stressors, and focuses on prevention. Ahmadi and Sadeghi (2017) evaluated how Neuman's systems framework pertained to inpatients. Results indicated Neuman's model could help guide nurses in caring for patients. The researchers also identified the physiological stressors of being at risk of trauma and falls.

The systems framework promotes prevention as the primary intervention (Petiprin, 2016). Nurses are encouraged to practice and promote prevention while providing care to patients. When using the framework in an acute care setting, this includes incorporating fall precautions with patients. Fall precautions would act as a primary prevention tool. By incorporating a bed

alarm to notify staff that a patient has potentially gotten out of bed, the facility helps nurses get to the patient's side before a fall occurs. Visual reminders of a patient's fall status, such as yellow socks, a yellow sticker on the door, a yellow blanket across the foot of the bed, and a yellow bracelet, notify all staff of the facility that the patient is at risk for falls. This knowledge should prompt staff to take extra precautions when transferring the patient from one surface to another, such as from the bed to a wheelchair. According to Neuman's framework, a system (body) is well if all parts are in harmony: "Illness is on the opposite continuum from wellness and represents instability and energy depletion among the system parts or subparts affecting the whole" (Neuman & Fawcett, 2011, p. 152).

Rationale

In this study, I applied Neuman's systems framework to falls related to the patient's environment as a significant stressor that affects the patient's overall well-being. The framework path begins with the nurse completing the initial assessment. During the assessment phase, the nurse determines if the patient is at risk for falls. If the nurse finds the patient is at risk, they will then implement precautions to prevent a fall. The nurse will evaluate the implementation of the fall prevention tactics for effectiveness by asking, "Did the patient fall?" With prevention being the focus of Neuman's model, this fits well for a fall program within an acute care setting.

Evidence-based studies have been completed applying Neuman's systems framework to the nursing care of patients. One such study has been mentioned previously regarding the care of a patient with multiple sclerosis. This study was conducted using Neuman's model to evaluate the patient and identify the stressors relevant to the patient's care. After the assessment was completed, nursing care was determined based on the three levels of prevention—primary, secondary and tertiary. Ahmadi and Sadeghi (2017) found 12 nursing diagnoses established

using this model, including the following needs: physiological, developmental, psychological, sociocultural, and spiritual.

Skalski et al. (2006) focused on the stressors identified in five populations of caregivers, cancer survivors, intensive care patients, care receivers, and parents of children who may be undergoing a surgical procedure. Researchers concluded this model could be used in all these populations to determine the best course of care for each patient. This is another confirmation that Neuman's systems model framework was appropriate for the project facility, because not all patients are the same age, have the same diagnosis, undergo the same procedure, or have the same interventions applied during their stay.

Advantages and Disadvantages

The advantage of using the assessment, nursing diagnosis, goal, planning, and implementation tool when incorporating Neuman's theory is that this is not a new concept. All nurses are taught this concept in nursing school, and it is one of the foundational tasks they incorporate. The fall program can be redeveloped, evaluated, and changed as ideas are deemed unsuitable. This process can be repeated until the program is once again showing positive results of fewer falls and zero falls with injury for inpatients.

The disadvantages would be the difficulty in determining when to stop the cycle. As nurses assess, they diagnose, define goals, plan a strategy, implement, and then evaluate again. Overevaluation could occur, become detrimental to the fall program, and change something that does not need to be changed.

Relevance to Problem of Interest

Neuman's framework, nursing assessment, nursing diagnosis, goals, planning, and implementation are relevant to preventing inpatient falls with injury. If Neuman's framework

had been included, patients would have been kept free from the stressors affecting staff. Instead, the patients experienced adverse outcomes that, after investigation and review, could be attributed to staff being more focused on what was happening to the facility than on continuing to provide excellent patient care.

Had the project facility applied primary, secondary, and tertiary prevention concepts, the changes made when the new corporation took over may not have negatively affected patient outcomes. Neuman's theory places the patient at the center of all and shows every action affects their physical, social, and psychological health. Patients in the facility during 2017–18 did not have an environment conducive to healing, and some of the outcomes directly reflected that concept.

Instrumentation

As mentioned, fall rates can be measured by unit or by the facility. For this project, I calculated fall rates by month and year to determine if any changes occurred after the project facility implemented its new strategy. The National Quality Forum (2013) developed a quality safety measure to quantify falls and falls with injury as "all documented patient falls . . . on eligible unit types in a calendar quarter. Reported as falls per 1000 Patient Days" (p. 5). Therefore, the formula for the fall rate for the unit or facility is the total number of inpatient falls divided by the adjusted patient days and multiplied by 1,000.

The instrument used in this project was the measurement method described above. When a fall occurs in the facility, the fall is entered into a database. At the end of the month, a fall report from the database can be initiated indicating the date, time, unit, day of the week, and status (patient, visitor, or employee). I determined the total number of inpatients from this report and the activity they were engaged in at the time of the fall. This included transferring, walking,

walking with assistance, slipping, tripping, bathroom urgency, or if the patient was found on the floor. The calculations for fall rate each month are taken to the fall prevention committee, which discusses each fall and the outcome of the fall review committee meeting with the staff involved to determine the possible cause and future prevention techniques. This information is also provided to the medical executive committee and the board of directors.

Summary

I reviewed the literature and identified a consistent theme of needing a concise fall prevention program for inpatients. I identified multiple interventions to prevent falls in acute care facilities, with no one prevention more successful than another. Most of these interventions are multifaceted, including a complete fall risk assessment, alarms, video and audio technology, education, rounding, and postfall assessments (see Appendix C) to determine what may have contributed to the fall.

Studies identified that fall precautions were typically applied only to patients at high fall risk, and the accuracy of the risk assessment depended on the initial risk assessment. Researchers mentioned several fall risk assessment tools, with STRATIFY and the Morse Fall Scale as the most common. Many of the studies also included effective implementation of interventions deemed appropriate for the program as a success factor. This includes staff consistently using fall prevention tools with an accurate fall assessment.

One weakness of the review was reliance on published information and the absence of definitive findings. I found no way to compare fall rates by hospital size or acuity and on a state or national level. For example, although the Joint Commission, AHRQ, and CDC provide national fall statistics, these statistics cannot be narrowed by hospital size or acuity.

I did not find any studies that compare inpatient falls by corporation, hospital size, or state. This information would allow facilities to help the public to determine if a fall is likely due to a facility's size or location. However, it may be challenging to complete a study on that scale or to compile the information in a way that is relevant to preventing falls.

Inpatient falls and injuries have been studied extensively, with noted authorities on the subject releasing new interventions. The number of falls and falls with an injury can be decreased with consistent patient education, communication, and bed exit alarm implementation. Continued review of each fall and fall with injury is necessary to keep facilities mindful of the need for constant vigilance regarding patient safety.

Chapter 3: Research Method

The research problem for this study was an increase in inpatient falls and falls with injury possibly related to the facility's fall prevention program. The incidence of inpatient falls appeared to increase following changes in the facility's systems, staff, and corporate ownership. The purpose of this study was to determine if there was a difference in inpatient falls and falls with injury by comparing fall data preintervention (2017–2018) to postintervention (2019–2020).

Practice Comparisons

I intended the preintervention and postintervention comparisons to identify possible gaps in the fall prevention program that could be alleviated to reduce the number of falls and falls with injury. To determine if improvement had been achieved, I compared data by quarter and by year for 2017–2018 and 2019–2020.

Scope of Project

This project included the inpatient population of a 103-bed rural acute-care hospital in the Southwestern United States. In 2018 this facility had over 6,400 inpatients, 26,000 emergency room visits, 88,000 outpatient service visits, and 12,000 surgeries, as well as 778 babies delivered. I focused this project on inpatients age 18 and up, whether or not they had been identified as a risk for fall when they experienced a fall.

I also tracked the time of day the falls occurred and what activity was being conducted during the fall, such as ambulation with or without assistance, transfer, or bathroom urgency. I looked at whether a patient was found on the floor or fell due to slipping from a bed or chair. I made a notation of the day of the week, if the same staff was included in several falls, and other similar factors that may connect one fall to another. Finally, I noted the patient's mental status

and any fall prevention interventions during a postfall huddle with all staff present during the fall.

I expected the project to show positive outcomes from the newly developed fall prevention committee, reeducation of staff on fall prevention policies, new interventions, such as a fall contract (See Appendix D), and a fall folder that educated patients on why they are at risk of falls (see Appendix B). I also expected the fall contract and educational materials provided to the patient and family would aid in gaining patient cooperation in calling for assistance before a patient attempted to get up. I also expected, at minimum, a 10% drop in the fall rate for the year.

The fall rate for the year ending 2018 was 1.76% per 1,000 adjusted patient days. Each month the fall rate is calculated as the number of falls divided by the number of adjusted patient days, multiplied by 1,000. For the annual fall rate, the number of falls each year is divided by the adjusted patient days for the year and multiplied by 1,000.

Project Design

This retrospective study was based on preintervention fall data compared to postintervention fall data, including inpatient falls and falls with injury. The study included all adult inpatients in the critical care or medical/surgical units. I collected data for patients who experienced a fall, including whether the patient was assessed as a risk for falls when the fall occurred. Then I reviewed the interventions and if an injury was sustained.

Instrument Measurement Tool

For the instrument measurement tool, I gathered the data and compiled them in an Excel spreadsheet to indicate the number of falls and injuries for inpatients at the project facility. In this retrospective study, I compared fall data from preintervention (2017–2018) to postintervention (2019–2020). The fall rate was calculated using the CMS Measures Inventory (2020). CMS

developed the fall rate tool in partnership with the National Quality Strategy to measure falls occurring in acute care, inpatient, or adult rehabilitation facilities. The total number of falls is divided by the number of patient days and multiplied by 1,000 to determine the rate for the facility. Patient days include inpatients who receive care in inpatient units, including critical care units, medical/surgical, step-down, and rehabilitation units. The units included critical care and medical/surgical units for the study facility.

Data Collection

Data collection included any falls in the facility, the day and time of the event, the staffing ratio for the unit, the staffing ratio for the primary caregiver, and the unit itself. In addition, I used a running spreadsheet to collect data about where falls occurred, what activity the patient was engaged in at the time of the fall, and what staff members were involved. I compared these data with those from previous years, previous months, and previous quarters to see if improvement occurred through fewer falls.

I collected demographic data for those involved in falls to identify each group's characteristics. I compiled fall information for patients 18 or older in the following age groups: 18–24, 25–39, 40–60, and over 60. I also broke down the data by whether the patient was male or female, if they had a history of falls before being hospitalized, and whether medications (see Appendix B) that affect blood pressure, pulse, or cognitive thinking were administered in a 2-hour time frame before the patient fell. I also grouped the falls by day and time to determine if a specific day of the week or time of day had more falls, such as early morning, late afternoon, or after bedtime.

I included the staffing ratios to determine if the ratio was followed according to the staffing matrix or if there was a staff shortage that day. I also noted whether the same staff

members were the primary caregivers for patients who fell or if the primary nurses were random. Finally, I tried to determine if the fall was a result of failed actions, such as failure to place the call light within reach, resulting in the patient attempting to get out of bed without assistance, or failure to activate the bed alarm, resulting in a patient getting out of bed without staff's knowledge.

I used the interviews completed during the fall review to determine if any outside influences needed to be considered in determining if the fall could have been prevented. I also looked at the description of the staff's interactions with the patient to determine if the fall may have been intentional based on past experiences with some intentional falls in the facility. I requested a pharmacist review the medications of each patient who fell to determine if medication could have been a factor.

Management and Analysis Plan

The dependent variable of the project was being at high risk for falls (*yes* or *no*). I used a chi-square analysis to compare the data to determine if any variables present were consistent for patients who experienced a fall in the research facility. The chi-square test is defined as "a test that measures how a model compares to actual observed data" (Hayes, 2020, para. 1). I used the chi-square goodness of fit test to determine if there was a significant association between patient falls and specific shifts, days of the week, or times of day when falls occur. The null hypothesis was the number of falls that occurred during the project time frame had no impact on the variables of day, time, or shift or other variable. The chi-square test was appropriate because it helps determine if the variables are truly independent. The measurement included the total number of falls in all inpatient units. I then separated these to determine if specific age ranges

were significant. I expected that patients experiencing falls would be over 65. I considered any fall that occurred with a patient under 65 an anomaly.

Methodology

I used quantitative analysis to determine if the outcome of fewer inpatient falls had been achieved. I entered all information into separate areas of an Excel spreadsheet to review. The facility collected the information using a postfall huddle form (see Appendix C). I then collected the data from that form for analysis. Finally, I transferred the data from the forms to the Excel spreadsheet.

I chose to use a spreadsheet for its ease and simplicity. It allows the data to be demonstrated in graph or chart form, allows for sorting and storing data, and can be used to calculate the information provided accurately. In addition, the data can be easily transported into a PowerPoint presentation to explain the information to others during meetings or in collaborations. The spreadsheet can also be used to track changes to any forms generated as a result of the data compiled in the file being used.

Feasibility and Appropriateness

There were no costs to me or the facility to complete the study. I received permission from the chief nursing officer and vice president of quality to access the site and the data. The resources required to complete the study included the postfall forms completed after patients experienced a fall and fall committee reports that included the number of falls and the dates of the falls. The vice president of quality made these resources available to me. Additionally, I had a time requirement to compile the data and organize them in a clear way. There was no barrier to completing the tasks necessary to compile the data.

Completing the data collection for this project allowed me to identify measures that do not make a difference or are redundant. The facility can take the information and continue to improve its fall prevention program to ensure greater patient safety. Identifying which changes the facility made previously could improve the program's sustainability.

IRB Approval and Process

I completed institutional review board (IRB) online training on December 20, 2019, and obtained approval (see Appendix E) from Abilene Christian University's IRB before beginning the project. The vice president of quality and the chief nursing officer granted IRB approval for the research facility. I applied for IRB approval because human subjects were involved. I did not collect patient identifiers, but I did use data collected during the subjects' stay in the research facility.

Sample and Setting

The research site was a 103-bed acute care hospital with more than 30 medical specialties. It is approximately 25 miles from a central metropolitan area in the Southwestern United States. In 2018 the facility had over 6,400 inpatients, 26,000 emergency room visits, 88,000 outpatient service visits, and 12,000 surgeries, as well as 778 babies delivered. There were 403 medical center employees, with 274 contracted employees working at the facility to provide care. These contracted employees included dietary, environmental, and admission services.

The facility was rated a four-star hospital by the CMS, was a top performer on the Joint Commission's Key Quality Measures, and received the Texas Hospital Quality Improvement Silver Award. In addition to being a Level IV trauma center, the facility was accredited by the Joint Commission and received the Press Ganey Summit Award for Core Measures. The facility

also had the distinction of being led for 39 years by the same chief nursing officer and many other directors and general staff with over 15 years' tenure.

According to the United States Census Bureau (n.d.), the most common religions in the area were Baptist, Church of Christ, Pentecostal, Methodist, Lutheran, and Presbyterian. The city where the hospital is located had a population of 28,284 and a density of 1,057 people per square mile. The median age was 35.2, and the cost of living received a B– as it was higher than in other areas of the state. Also, approximately 26% of the population was between the ages of 65 and 84.

I completed a power analysis to determine the number of charts I needed to review to detect the effect of a given size. For example, in 2017, there were 64 inpatient falls. Using the facility fall prevention committee report, I considered using a two-tailed test to test the difference between the two groups, with an error probability of 0.05 and a power of 0.8. Therefore, I needed to have a sample size of 128 charts to review based on the analysis plan.

Conclusion

The purpose of the study was to review the facility's fall risk program to ensure it followed all current evidence-based practices and then relaunch the fall prevention program through staff education of nursing and allied health staff members. Many studies have indicated where data can be used to reinvent a fall program. Recognizing the gaps and developing a plan of action to implement a new platform could assist the facility in reducing the number of falls and falls with injury.

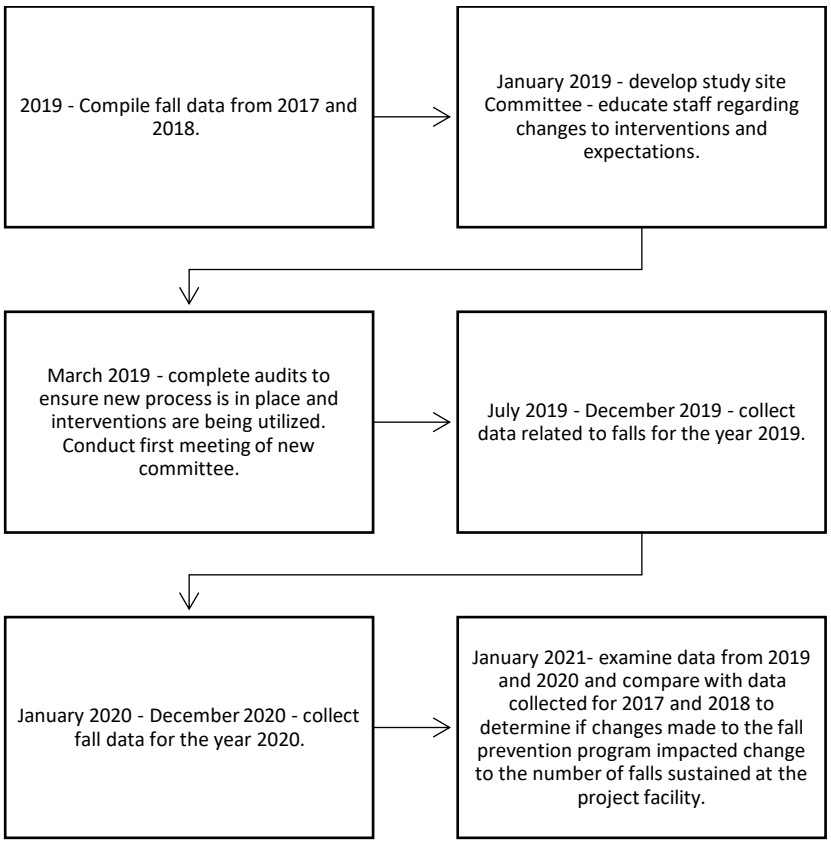
Timeline

The project included preintervention data for inpatient falls for 2017–2018 and postintervention fall data for 2019–2020. The data collected were divided by month, unit, fall risk status, and personal demographics. The comparisons included month-over-month, quarter-

over- quarter, and year-over-year. The data review and determination of any improvements occurred in 2021. Presentation to the research facility leadership occurred in March 2022 (Figure 1).

Figure 1

Timeline



Summary

This project was completed to improve patient outcomes, specifically the number of falls and falls with injury for inpatients at the project facility. Changes to the fall prevention committee involved frontline staff and incorporated their input in redesigning the way falls are reviewed, ensuring the fall policy is provided to all staff. The new interventions were expected to assist in reducing falls. Increased communication with patients, beginning with a fall contract (see Appendix D), helped explain to the patient why they were at risk for falls and allowed the patient to ask questions. A visual board provided an explanation for and supported consistent application of the "Safety Trumps Privacy" policy of escorting patients to the bathroom and

remaining within arm's length while providing as much privacy as possible. These steps were expected to gain patient cooperation and compliance in calling for assistance as well as increased awareness among staff, ensuring bed exit alarms were activated consistently. I expected the project to show a decrease in falls and falls with injury by comparing fall data in 2017–2018 to 2019–2020.

Chapter 4: Results

I collected data on falls and falls with injury to determine if changes to the fall prevention program made a difference in the number of falls in the research facility. As a result, the fall prevention committee was revised in early 2019, and staff received education on fall prevention interventions for all patients assessed at risk for falls. Unit directors conducted the education through in-person staff meetings, “read-and-sign” written communication, and demonstrations. In addition, newly hired staff received education during their orientation, which their director and preceptor signed off on.

The inpatient unit directors then completed daily audits by running a report of patients assessed at risk for falling and by physically checking the patient rooms to ensure fall precautions were in place. If fall precautions were not in place, unit directors held a discussion with the nursing staff at the time of the audit. This helped create a habit of putting fall precautions in place among the nursing staff.

I reviewed four years of data to compare the effects prechange (2017–2018) to postchange (2019–2020). In these four years, there were 287 inpatient falls reported. A total of 174 inpatient falls occurred during 2017 and 2018 (108 and 66, respectively). By contrast, 2019 and 2020 had a total of 113 falls (52 and 61, respectively). Additionally, I reviewed all falls reported in the four years to identify trends according to nursing shift, age group, the staff involved, and unit.

Demographics

I analyzed the data according to the following categories: nursing shift, unit, and patient age.

Shift

Figure 2 shows the falls occurring in 2017 and 2018 by nursing shift. Results revealed 103 falls during the 7 a.m.–7 p.m. shift and 71 falls during the 7 p.m.–7 a.m. shift. Of the patients who fell during the day shift, 13 were assessed as being at risk for falls but did not have fall precautions in place. During the night shift, 27 patients who fell did not have fall precautions in place. In reviewing postfall huddle forms (see Appendix C), I found that staff reported different reasons for not incorporating bed alarms. These included not knowing how to set the bed alarm, not knowing that portable alarms were available for beds without built-in alarms, and forgetting to reset the alarm after previously assisting the patient out of bed. Two reports stated the patient's family turned off the bed alarm and did not let staff know about this before they left.

Figure 2

Reported Facility Falls by Shift for 2017–2018

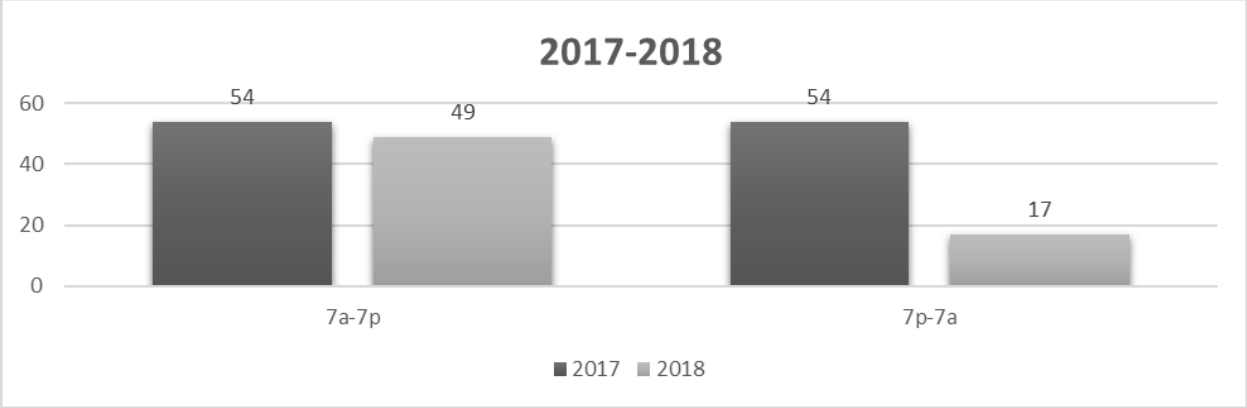
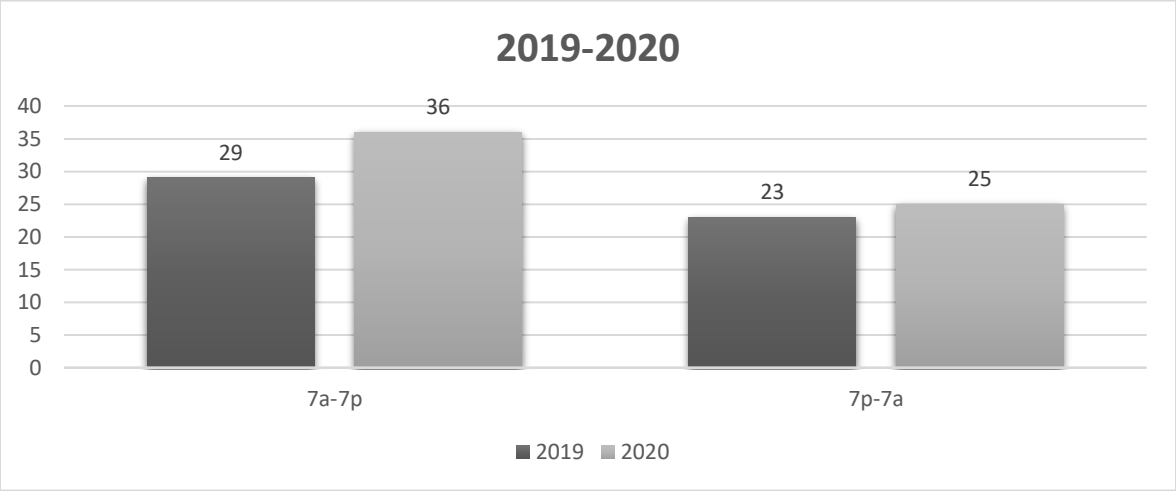


Figure 3 shows the falls by shift for 2019–2020, revealing 65 falls during the 7 a.m.–7 p.m. shift and 48 falls for the 7 p.m.–7 a.m. shift. In reviewing the falls in 2019 and 2020, I found three falls among patients that were not assessed at risk for falling. Of these falls, none experienced serious injury. The data from the day shift falls during this period revealed 21 patients who had been assessed at high risk for falls and had the proper precautions in place and

40 patients who had been assessed at high fall risk with no precautions in place. For the night shift, 16 falls occurred with patients assessed at risk for falls and had fall precautions in place, with 41 falls occurring with patients who were assessed at risk for falls but had no fall precautions in place.

Figure 3

Reported Facility Falls by Shift for 2019–2020



For both periods, 2017–2018 and 2019–2020, the data review indicated that when falls occurred with fall precautions in place, staff reported patients were noncompliant with the precautions and got up alone, resulting in a fall. There were also reports of patients experiencing a fall while being assisted by staff. In most of these instances, the patient became weak. In one episode, the patient got out of the shower and slipped on water on the floor. None of the falls that occurred when staff were present resulted in an injury to the patient.

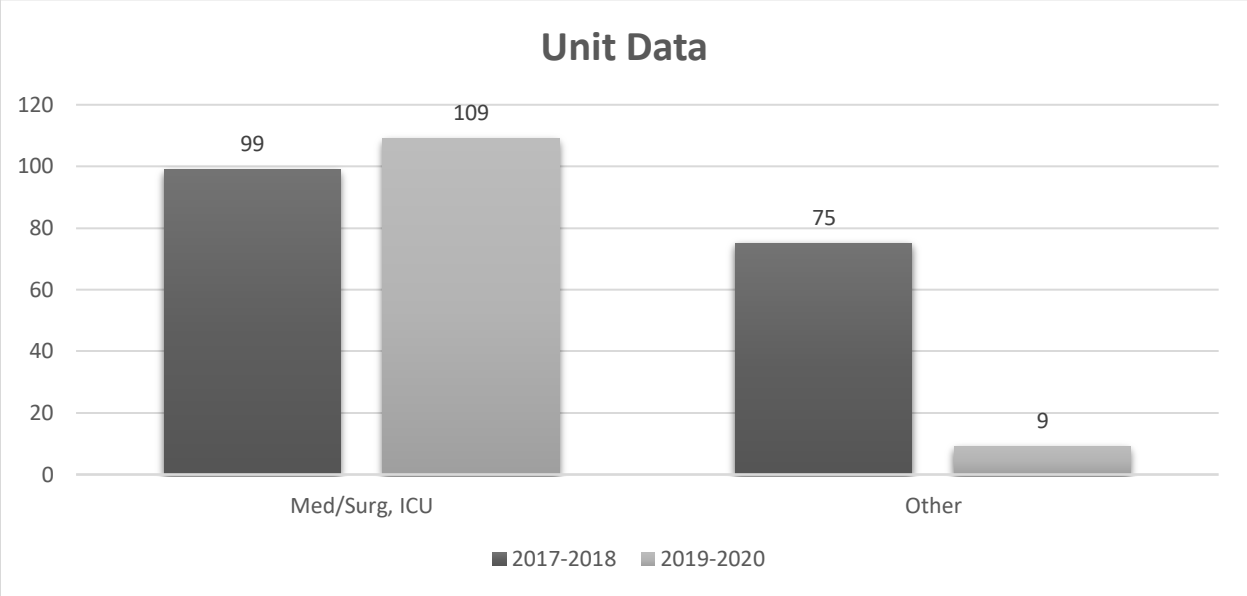
Unit

When looking at the data by unit in 2017–2018, I found 99 falls that occurred in the medical/surgical and intensive care (ICU) units, which typically house the most inpatients. The remaining 75 falls occurred in other units, such as labor and delivery, postpartum, and behavioral

health. In 2019–2020, 109 falls occurred in the medical/surgical and ICU units, and the remaining nine occurred in the smaller units (Figure 4).

Figure 4

Reported Facility Falls by Unit



Patient Age

As I collected fall data by age, I found that the information for 2017 was not available due to changes to how the data were collected in the facility's system. Therefore, the data are shown separately by age group for the years 2018, 2019, and 2020 in Figure 5 and Table 3.

Figure 5

Reported Facility Falls by Age Group

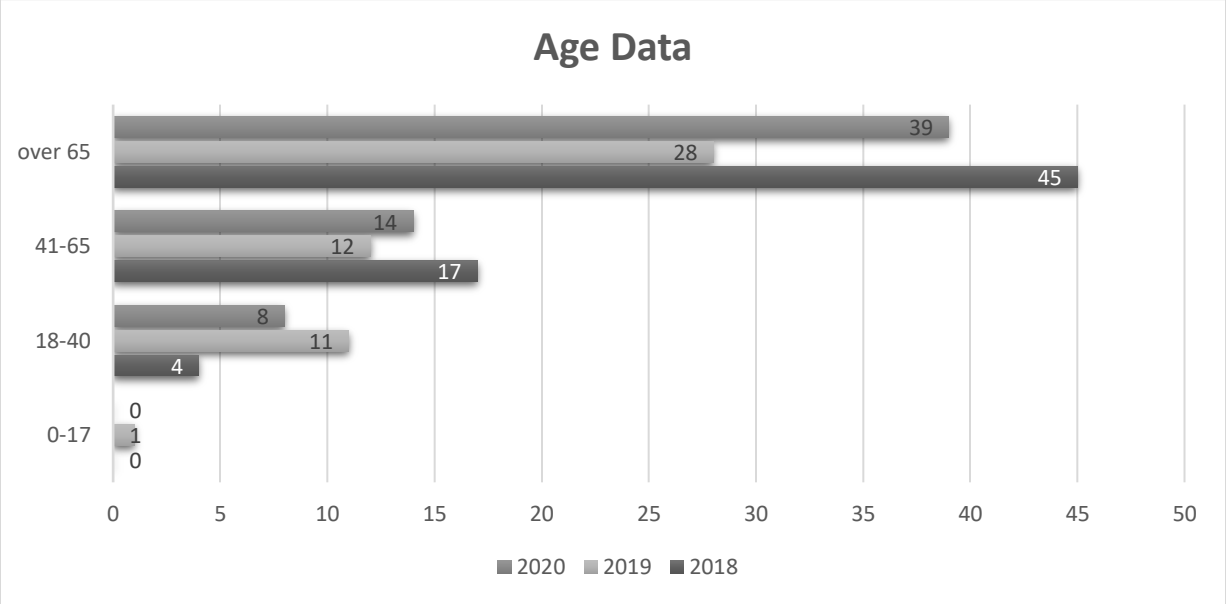


Table 3

Reported Facility Falls by Age Group

Age range	2018	2019	2020	Total for each age group
0–17	0	1	0	1
18–40	4	11	8	23
41–65	17	12	14	43
Over 65	45	28	39	112
Total falls	66	52	61	179

In 2018 the data indicated 45 falls for inpatients over 65, 17 for ages 41–65, and four for ages 18–40. In 2019, there was a fall for an inpatient under 17, but this was considered an anomaly for this study. That year, there were 28 patients over the age of 65 who fell, and in 2020 there were 39 patients over the age of 65 who fell. Of the 179 falls that occurred, 112 (62.569%) occurred in patients over 65.

Findings

The problem I researched was whether there was a difference in the number of patient falls and falls with injury after changing the fall prevention program, implementing new nursing interventions, and providing education about the new program to staff. The data showed a decrease in the number of falls from the prechange time frame (2017–2018) to the postchange time frame (2018–2019). In addition, there were 61 fewer inpatient falls in 2019–2020 than in 2017–2018, which suggests the changes successfully decreased the number of inpatient falls experienced in the facility. Figure 6 represents the total falls for the period researched, separated year-over-year and quarterly. Figure 7 indicates the trend of decreased falls year-over-year.

Figure 6

Research Facility Falls by Quarter

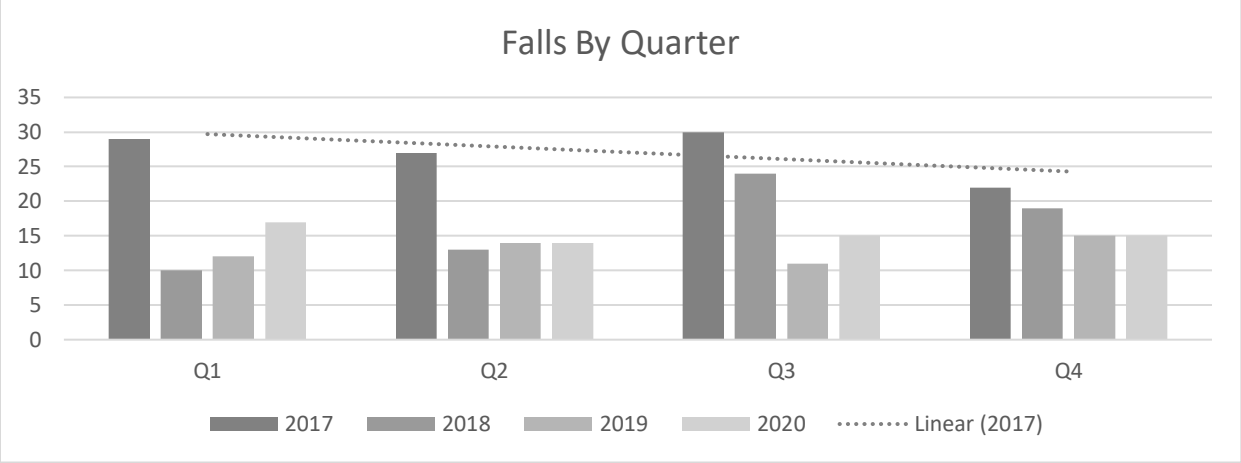
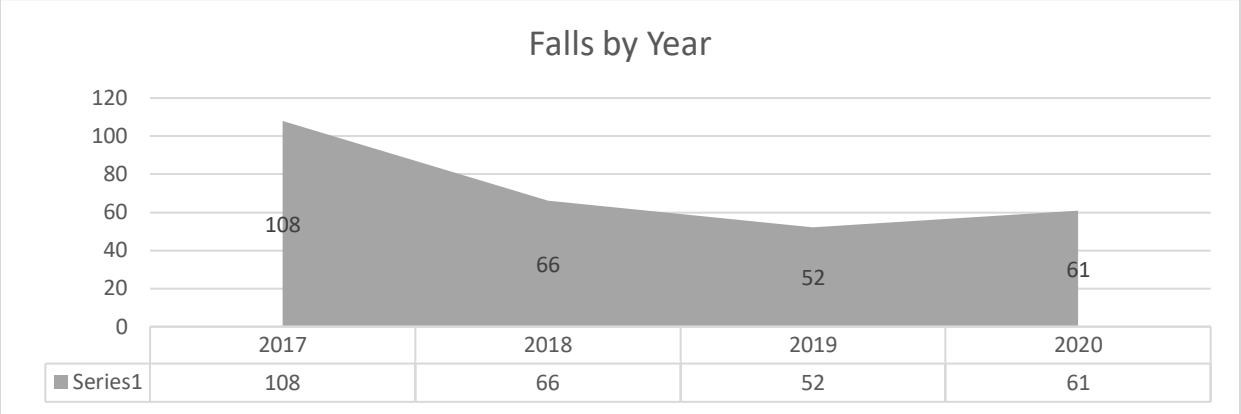


Figure 7

Research Facility Falls by Year



I used chi-square analysis to determine if the presence of fall precautions made a difference in whether patient falls occurred during the day shift or night shift. The null hypothesis was the time of day did not affect the number of falls that occurred during the project time frame. The measurement included the total number of falls in the inpatient units. I then separated these by whether the fall occurred on the day or night shift and whether fall precautions were in place. The relationship between these variables was not significant, $X^2(1, N = 328) = 0.0265$, $p = .870714$ with a significance of $p < .05$.

Table 4 supports the null hypothesis. The time of day did not affect whether a patient fell or not, but the presence of fall precautions did make a difference.

Table 4

Chi-Square Analysis of Fall Precautions in Place vs Not in Place by Shift

Day shift	Night shift	Marginal row totals
70 (70.73) [0.01]	75 (74.27) [0.01]	145
90 (89.27) [0.01]	93 (93.73) [0.01]	183
160	168	328 (Grand Total)

The chi-square statistic was 0.0265. The *p*-value was .870714, meaning the relationship was not significant at $p < .05$. I found 70 patients who fell during the day shift had fall precautions, and 90 did not. For the night shift, 75 of the patients who fell had fall precautions in place, and 93 did not. There was no significant difference in putting fall interventions in place and not implementing the interventions between day-shift and night-shift staff.

Project Strengths and Weaknesses

The project had many strengths, including using data collected on postfall forms (see Appendix C) during the review of each fall that occurred. These data allowed me to understand additional issues the staff or unit may have been experiencing at the time of the patient's fall. I identified these issues as excessive admissions, multiple patients needing assistance at the same time, staffing issues, and the staff's experience level. The ease of obtaining the data was another strength of the study. All falls were reported, and unit and facility leaders reviewed them to understand what led to the patient's fall.

Weaknesses of the study included lack of sufficient data from 2017. While the number of falls was available, information regarding how the falls occurred and what was happening in the unit were not available. Another noted weakness of the study was the inability to determine what type of education each patient received and if the patient understood the education. There was no educational template for staff to follow to ensure all patients received the same information regarding their risk for falling.

Chapter 5: Discussion, Conclusions, and Recommendation

The research question for this study was, "Was there a difference in the number of inpatient falls and falls with injury when comparing the data from the standard fall prevention bundle (used in 2017 and 2018) versus data from the new fall prevention bundle (used in 2109 and 2020)?" Results revealed fewer falls after the fall prevention program was revised. There were 145 patient falls with fall precautions in place, and 183 falls without precautions in place. In addition, there were no serious injuries reported in 2019 or 2020; by contrast, in 2017 and 2018 there were six serious injuries from inpatient falls.

However, there was no statistically significant difference between patients who had fall precautions in place (70.73 [0.01]) and patients who did not have precautions in place (89.27 [0.01]). Further, there were no statistically significant differences related to time of day or gender. Findings showed that changes to the fall prevention program cannot make a difference in the number of patient falls if patients and staff do not comply with the interventions and precautions in place. Additional research is needed to determine the accuracy of fall assessments and ensure the proper fall precautions are implemented.

Discussion

The study showed fewer falls after the fall prevention committee was revised, new interventions were introduced, and staff were educated on implementation expectations. The data revealed more patients fell when fall precautions were not implemented than when there were fall prevention interventions, such as bed alarms, yellow armbands, and fall mats to prevent injury. Also included in the new interventions was a fall contract (see Appendix D) that stated the nurse would review why the patient was at risk for falling, what interventions were in place, and the expectations for patient compliance. The intent was to create a dialogue during

admission regarding safety and to reinforce safety measures throughout the patient stay. The expectation was to deter patients and families from turning their bed alarms off or getting up alone and possibly experiencing a fall. Additional research must be conducted to determine how the COVID-19 pandemic and subsequent shortage of nursing staff affected the implementation of fall precautions.

Implications

The research facility must routinely review its fall prevention protocols to determine if revisions are necessary. Patients experienced fewer falls when fall precautions were in place. Failure to put fall precautions in place could occur due to improper fall risk assessment or not accurately identifying the need for standby assistance when a patient is ambulating. The data support the need to provide routine education to the staff regarding patient safety and fall prevention expectations.

This project was needed to show that a fall prevention program is essential to the facility to help keep patients safe. Still, the program must be reviewed often to ensure continuous improvement. In addition, organizational leaders must listen to their staff and distinguish their levels of expertise along with the realities of their work environment. Inpatient falls can be reduced if staff feel they have the tools to provide safe, effective care.

When reviewing the postfall reports (see Appendix C), I found that the most common theme was the need for a proven, consistent fall risk assessment tool, such as the Morse Fall Scale. Due to COVID-19 precautions, I could not directly interview staff regarding their thoughts on the fall risk assessment tool. However, several postfall reports noted that staff did not know that using a walking aid or having more than one diagnosis put patients at risk for falls.

Therefore, implementing a proven fall risk assessment scale would benefit the facility and patients.

Project Alignment With DNP Essentials

This project aligned with the DNP Essentials because it allowed me to understand the organizational culture in the research facility and provide input on changes that would improve the quality of care patients receive as follows:

1. Scientific underpinnings for practice. This project aligned with the conceptual foundation of nursing by focusing on human beings' well-being and optimal functioning and by reviewing the process in place to keep patients safe from falls in the facility. The study also focused on how staff are empowered to apply any interventions necessary to keep patients safe from falls.
2. Organizational and systems leadership for quality improvement and systems thinking. This study focused on the needs of inpatients and the need for new care delivery models that are evidence based. Specifically, there is a need for a uniform system for identifying patients at risk for falls and specific interventions to keep them safe while receiving care in the facility.
3. Clinical scholarship and analytical methods for evidence-based practice. This project used existing literature and other evidence to determine and recommend the best evidence to reduce inpatient falls in the facility in the future.
4. Information systems/technology and patient care technology for the improvement and transformation of health care. The research process incorporated data from the research facility's health information program. I then used a simple database to collect and disseminate the information for reporting purposes.

5. Health care policy for advocacy in health care. This study enabled me to analyze the fall prevention policy used at the facility and make recommendations for revision and implementation throughout the facility. The study's conclusions allowed me to recommend a fall risk assessment platform that all nursing staff can use to determine a patient's risk for falling while in the facility.
6. Interprofessional collaboration for improving patient and population health outcomes. This study allowed me to collaborate in developing and implementing new practice guidelines and standards of care for patients at risk for falls. New interventions were implemented and have been sustained to prevent patients from falling.
7. Clinical prevention and population health for improving the nation's health. This study allowed for evaluation of the care delivered by staff at the research facility and how improvements could be made to ensure patient safety is always in focus. Assessing patients' risk for falling upon admission and discussing the risk for falls with the patient and family allow patients to be involved in their safety and care.
8. Advanced nursing practice. This study allowed me to demonstrate advanced levels of clinical judgment in designing and delivering evidence-based care to improve patient outcomes. I implemented interventions based on the science of nursing and patient safety to ensure patients are kept as safe as possible.

This project allowed for planning and development of a patient-centered program that was implemented and evaluated based on the patients' quality of care. The project allowed me to collaborate with leadership and frontline staff to identify improvements that benefit patients and the facility. Investigating a fall prevention program and encouraging the facility to review it often contribute to improved patient outcomes.

Recommendations

I found variations in the consistency of implementation of fall precautions according to nursing shift. Therefore, the research facility would do well to focus on fall prevention and patient safety. While some nurses implement fall precautions without constant supervision, the night shift in particular needs accountability practices to ensure care is the same from shift-to-shift and nurse-to-nurse. When leaders set expectations and follow up to ensure those expectations are met, patients experience much better outcomes.

Future projects should address the accuracy and timeliness of patient fall risk assessments and the relationship to patient falls. This would help facilities determine if patients are accurately assessed as to their risk for falling and if interventions are timely enough to prevent a fall. Changes could then be made if needed. Another project would be to evaluate the number of patient falls in relation to the type of nursing staff. For example, researchers could study differences in fall rate when Regional Advisory Council (RAC) and contract nursing staff are used compared to falls that occur when core nursing staff are providing care. This would provide important information regarding the need to provide education regarding the temporary staff's expectations for adhering to policies aimed at keeping patients safe.

In conducting future studies at this facility to reduce the number of inpatient falls and falls with injury, I recommend the facility do so as a committee throughout the year in order to make changes in real time to improve patient safety. This allows the facility to put the latest evidence-based practices in place to ensure falls occur less often. Further, future studies should include patients who fell and interviews with these patients to determine their perspective on how the fall occurred and how the fall could have been prevented, in their opinion. Obtaining

information from the patient perspective may allow the facility to have a more significant impact on preventing future falls.

I plan to share the study results with the research facility leadership and include the inferential data collected during the postfall review. This information included staffing levels when the patient falls occurred, tasks the staff may have been occupied with, and what the patient was attempting to accomplish. The goal of sharing the study is to encourage the facility to fill the gaps found and further reduce inpatient falls and falls with injury. In addition, I plan to provide recommendations based on the data collected for the facility leadership to evaluate their feasibility.

This process was different than the facility leadership's process for reviewing the fall rates reported by the fall prevention committee. At the time of this study, no action had been taken when fall rates were reported. When I discuss the findings with the facility leadership, I plan to request that they consider recommendations for improving falls and fall rates at the facility.

Conclusion

This study provided evidence that accountability and consistency in implementing fall prevention interventions for patients assessed at risk for falling can reduce the number of falls occurring in the research facility. Nursing staff willing to follow up on their risk assessment with actions to prevent falls help keep patients safe while receiving care. Educating staff regarding expectations and following up to ensure expectations are met reduced the number of falls at the project facility from 2017–2018 to 2019–2020. Purposeful review of the fall prevention program each year can reduce falls in the hospital setting by determining what interventions are helping to reduce falls and what policies need to be revised.

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Appendix A: Literature Review

Citation	Purpose	Design	Sample	Independent variables	Dependent variables	Statistical tests	Results	Strengths	Weaknesses	Clinical outcomes
Cuttler, S. J., Barr-Walker, J., & Cuttler, L. (2017). Reducing medical-surgical inpatient falls and injuries with videos, icons and alarms. *BMJ Open Quality, 6*(2), e000119. https://doi.org/10.1136/bmjoq-2017-000119	To evaluate the effectiveness of patient education videos and fall prevention visual signaling icons added to bed exit alarms in improving acutely hospitalized medical–surgical inpatient fall and injury rates.	Performance improvement study with historical controls	Four medical–surgical units	Adult medical–surgical inpatients	Inpatient falls	The main outcome measure was the incident rate per 1,000 patient days (PDs) for patient falls, falls with any injury, and falls with serious injury. The incident rate ratio (IRR) for each measure compared January 2009–September 2010 (baseline) data with that of the follow-up period of January–December 2015 (intervention).	Falls decreased 20%, from 4.78 to 3.80 per 1,000 PDs (IRR 0.80, 95% CI [0.66, 0.96]). Falls with any injury decreased 40%, from 1.01 to 0.61 per 1,000 PDs (IRR 0.60, 95% CI [0.38, 0.94]). Falls with serious injury decreased 85%, from 0.159 to 0.023 per 1,000 PDs (IRR 0.15, 95% CI [0.01, 0.85]). Icons were not fully implemented	When volunteer-delivered education videos and three-mode bed exit alarms were used, a significant decrease was observed in patient falls (20%), falls with any injury (40%), and falls with serious injury (85%). Injury reduction met and serious injury reduction exceeded the Partnership for Patients goal of a 40% reduction.	Fall icons were never fully implemented. It was necessary to reprint icons every 12 hours. Training was inadequate.	Efforts to risk stratify with the existing screening tool and an electronically generated list of patients at risk may have helped to identify prospective interventions for individual patient risk factors. It is unknown if there is an ideal time to provide education to patients during their stay in hospital. Patients are more likely to be mobile by the end of their hospitalization than when they arrive. Although they are less debilitated, there are more opportunities for an ambulatory patient to fall.

Citation	Purpose	Design	Sample	Independent variables	Dependent variables	Statistical tests	Results	Strengths	Weaknesses	Clinical outcomes
Chu, R. Z. (2017). Preventing in-patient falls; the nurse's pivotal role. *Nursing, 47*(3), 24–30. https://doi.org/10.1097/01.NURSE.0000512872.83762.69	Practical evidence-based interventions that nurses can implement for fall prevention.	Implementation of a centralized video monitoring system	8–10 patients	Inpatients in an acute care unit	Falls	Not indicated	A total of 2,500 patients were monitored over two years, with only two fall incidents. The overall expense of installing the equipment was $82,000. In return, the institution saved $250,000 yearly due to decreased use of unlicensed assistive personnel, and patient safety was enhanced.	Staff could see patients at all times as long as staff were present to watch the screens from the video monitoring system.	The equipment is costly, and not all hospitals can install this expensive equipment and hire up to 30 monitor techs to monitor patients.	Falls were prevented, for example, when patients were getting out of bed and staff responded right away to the monitor alert. The monitor alert is activated when the patient is trying to stand at the edge of the bed. Staff will be at the bedside within five minutes to assist the patient. The patient units' compliance with the National Database of Nursing Quality Indicators increased since the fall prevention program began.

Citation	Purpose	Design	Sample	Independent variables	Dependent variables	Statistical tests	Results	Strengths	Weaknesses	Clinical outcomes
King, B., Pecanac, K., Liebzeit, D., & Mahoney, J. (2018, March 19). Impact of fall prevention on nurses and care of fall risk patients. *Gerontologist, 58*(2), 331–40. https://doi.org/10.1093/geront/gnw156	Falls are common events for hospitalized older adults, resulting in negative outcomes both for patients and hospitals. The Centers for Medicare and Medicaid Services (CMS) has placed pressure on hospital administrators by identifying falls as a "never event," resulting in a zero-falls goal for many hospitals. Staff nurses are responsible for providing direct care to patients and meeting the hospital no-falls goal. Little is known about the impact of zero-falls goals on nurses, patients, and the organization.	Researchers conducted a qualitative study using grounded dimensional analysis (GDA) to explore nurses' experiences with fall prevention in hospital settings and the impact of those experiences on how nurses provide care to patients at risk of falls.	27 registered nurses and certified nursing assistants (CNAs)	Nurses/ CNAs	Intense messaging from nursing administration	In-depth interviews with open, axial, and selective coding to analyze data. A conceptual model that illustrates the impact on nurses of intense messaging from nursing administration to prevent patient falls; the actions nurses take to address the message; and the consequences to nurses, older adult patients, and the organization.	Intense messaging from hospital administration to achieve zero falls resulted in nurses developing a fear of falls, taking action to protect themselves and their unit, and restricting patients at risk of falls to meet the hospital goal.	Inclusion of nurses attempting to prevent patient falls and injury. Identification of nursing characteristics that seem to have a protective effect, such as being confident in clinical decision-making, having a formal or informal leadership role on the unit, and years of experience as a nurse.	Including observations beyond interviews could have strengthened the analysis by allowing the researcher to seek clarification if participants engaged in actions that were not consistent with what they described. As participants were recruited from general inpatient adult medical and surgical units from two hospitals, the results may be applied only to these types of settings. Other hospital units, such as rehabilitation, may produce different results because falls may be seen as an inevitable part of the rehabilitation program and its goal of regaining functional independence for patients.	Results identified the unintended consequences of fall prevention messaging on nurses and older adult patients. Further research is needed understand how nurses care for fall risk patients.

Citation	Purpose	Design	Sample	Independent variables	Dependent variables	Statistical tests	Results	Strengths	Weaknesses	Clinical outcomes
Aarons, G., Ehrhart, M., Farahnak, L., & Hurlburt, M. (2015, January 16). Leadership and organizational change for implementation (LOCI): A randomized mixed method pilot study of a leadership and organization development intervention for evidence-based practice implementation science. *Implementation Science, 10*, 11. https://doi.org/10.1186/s13012-014-0192-y	Overcoming the challenges associated with developing, implementing, and sustaining a fall prevention program.	Participants were 12 mental health service team leaders and their staff ($N = 100$) from three different agencies that provided mental health services to children and families in California.	12 mental health service team leaders and their staff ($N = 100$)	Managers were randomized to the LOCI ($n = 6$) or control condition ($n = 6$).	The clinicians whom participants supervised	The first 3 months of LOCI focused on developing foundational (transformational and transactional) leadership behaviors. The latter 3 months focused on developing strategic leadership and climate for evidence-based practice implementation.	Quantitative and qualitative analyses support the LOCI training and organizational strategy intervention regarding feasibility, acceptability, and perceived utility, as well as impact on leader- and supervisee-rated outcomes.	Various aspects of the LOCI training (initial training, weekly coaching calls, group conference calls, and booster session) were seen as practical, efficient, realistic, and even desirable.	Issues related to feasibility involved the fit with job responsibilities and work constraints, the efficiency of in-person training, the flexibility of training and coaching, and survey burden. There was concern with the length of the clinician survey for multiple assessments.	There were no statistically significant differences in variances for any of the leader report items or clinician report scales across the two groups.

Citation	Purpose	Design	Sample	Independent variables	Dependent variables	Statistical tests	Results	Strengths	Weaknesses	Clinical outcomes
Health Research & Educational Trust. (2016, October). *Preventing patient falls: A systematic approach from the Joint Commission Center for Transforming Healthcare Project*. http://www.hpoe.org/Reports-HPOE/2016/preventing-patient-falls.pdf	To identify the various contributing factors for inpatient falls and develop and validate improvements to achieve sustainable results.	Each participating hospital identified an inpatient pilot unit for the purposes of this project. The units chosen included four medical surgical units, one medical oncology unit, a cardiology unit, and a medical–surgical/stroke/telemetry unit.	Seven hospitals ranging from a 100-bed community hospital to a 1,700-bed academic medical center	Adult patients 18 years of age or older who were admitted and discharged from the designated pilot units	Only falls that occurred while the patient was physically on the designated pilot units were included in this project. These were identified as falls "on the unit," consistent with National Database of Nursing Quality Indicators (NDNQI) recommenda-tions.	The top 10 contributing factors (conditions identified most frequently by hospitals) for falls and falls with injury were grouped into six categories: (a) fall risk assessment issues, (b) handoff communication issues, (c) toileting issues, (d) call light issues, (e) education and organiza-tional culture issues, and (f) medication issues.	Five of the participating organizations submitted data throughout the project timeline. In aggregate, these organizations demonstrated a 62% reduction in the falls with injury rate and a 35% reduction in the falls rate.	Contributing factors to falls are varied and complex. While solutions appear logical on the surface and many are thought to be in practice already, organizations found that common practices were not implemented consistently. Health care organizations also found leadership support was critical to success, especially in ensuring those involved in the project have time to collect detailed data for accurate measurement and analysis. This leadership support was also important during implementation of solutions.	Common fall precautions are not implemented consistently across all units of the hospital.	By targeting solutions to specific contributing factors, hospitals can be assured they are (a) addressing the right problems within their organizations, (b) using time and resources for only those issues that are critical to quality at their organization, and (c) not devoting money and resources to implementing solutions that do not contribute factors for their organization.

Citation	Purpose	Design	Sample	Independent variables	Dependent variables	Statistical tests	Results	Strengths	Weaknesses	Clinical outcomes
Johnston, M., & Magnan, M. A. (2019). Using a fall prevention checklist to reduce hospital falls: Results of a quality improvement project. *American Journal of Nursing*, *119*(3), 43–49. https://doi.org/10.1097/01.NAJ.0000554037.76120.6a	This quality improvement (QI) initiative aimed to promote patient safety by improving adherence to an existing hospital-approved fall prevention protocol. Specific aims of the initiative were to evaluate the impact of using a fall prevention checklist on (a) the implementa-tion of a bundle of 14 specific interventions (the fall prevention protocol) and (b) the incidence of falls on participating units.	A QI team conducted a 26-day fall prevention initiative. Data were collected on day and night shifts for 13 days each. The effect of using a new 14-item checklist was evaluated based on nursing staff's adherence to each intervention on the hospital-approved fall prevention protocol and the incidence of falls on the test unit. Oncoming staff used the checklist during change-of-shift handoffs to determine whether all prevention interventions were in place before accepting care of the patient. Incidence of falls was tracked daily.	37 nursing staff (RNs and nursing assistants) participated in the pilot study and completed 90 fall prevention checklists.	Fall prevention checklist implementa-tion	Patient falls		37 nursing staff (RNs and nursing assistants) participated in the pilot study and completed 90 fall prevention checklists. The most frequently missed intervention was setting the bed alarm, which was set incorrectly 19% of the time. There were no patient falls during the pilot study.	Researchers identified two common errors in implementing fall prevention tools. First, nursing staff were not activating Zone 2 of the bed alarm 19% of the time, or nearly one time in five. The second most missed prevention intervention was fall risk signage. When nursing staff feel pressured to prepare a patient's room for admission, they may not post the appropriate signage, not because they do not know how to do it but because they are working "on autopilot."	Staff were reluctant to participate when they thought they were being judged. Some staff members felt their patients were more apt to fall and were reluctant to give information.	By evaluating the use of the checklist, the research team identified missed prevention interventions and opportunities for improvement in the fall prevention program.

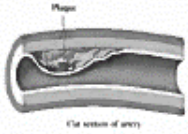
Citation	Purpose	Design	Sample	Independent variables	Dependent variables	Statistical tests	Results	Strengths	Weaknesses	Clinical outcomes
Currie, L. (2008). *Patient safety and quality: An evidence-based handbook for nurses.* Agency for Healthcare Research and Quality. https://www.ncbi.nlm.nih.gov/books/NBK2653/	Quality improvement project/ research	Observational study without controls Outcome: rate of falls, injury from falls	Unknown number of patients at risk for falls from one hospital-based home care agency	Adult medical–surgical inpatients	Inpatient falls and falls with injury	Fall prevention program, multidisci-plinary risk assessment with Morse scale, and evidence-based guidelines	Number of patient falls remained relatively stable, but fewer patients were injured in falls.	Noticeably fewer patients were injured when a fall occurred.	Falls were not noted to decrease; they stayed relatively the same.	The number of reported falls increased, possibly related to increased staff awareness and better reporting.

Citation	Purpose	Design	Sample	Independent variables	Dependent variables	Statistical tests	Results	Strengths	Weaknesses	Clinical outcomes
Laing, S. S., Silver, I. F., York, S., & Phelan, E. A. (2011). Fall prevention knowledge, attitude, and practices of community stakeholders and older adults. *Journal of Aging Research, 9*. Article 395357. https://www.hindawi.com/journals/jar/2011/395357/	Assess the knowledge, attitude, and provision of recommended fall prevention (FP) practices by employees of a senior-serving organization and participation in FP practices by at-risk elders	Trained interviewers administered structured telephone surveys to employees of senior-serving organizations in Washington State.	50 employees who worked for organiza-tions that serve older adults	Knowledge, attitude, practices, and perceived barriers	Attitude and provision of fall prevention services	The data were analyzed in 2005 using SPSS 10.0 (Chicago, IL). Percentages describe categorical data and chi-square tests assess the significance of proportional differences. Unless otherwise noted, all reported statistically significant differences were calculated at the 95% confidence level.	Employees identified insufficient resources as the main barrier to regular provision of fall prevention services (80%). Lack of funds was the primary resource limitation (66%). Other barriers included lack of trained personnel (28%), lower organizational priority (24%), and low awareness of the importance of fall prevention (22%).	The study provided information about FP knowledge among employees of senior-serving organizations and quantified FP services prior to development of statewide fall prevention initiatives. This information may help to direct efforts to broadly disseminate fall prevention strategies to community-based organizations and permit assessment of progress over time.	Survey items were not pretested, so selection bias may have been present. A few representatives were aware of the DOH Injury and Violence Prevention Program's interest in addressing older adult fall prevention; therefore, some respondents may have been motivated to give favorable representations of their organizations, and out of social desirability purposes, to endorse fall prevention as a critical health issue. Overall service provision was low.	Messages targeting senior-serving organizations should focus on increasing awareness of specific fall prevention practices shown to be effective in reducing falls. Messages targeting elders should address the importance of fall prevention for older adult health, educate them about specific FP practices, and emphasize the importance and effectiveness of fall prevention strategies for preserving function, independence, and well-being.

Citation	Purpose	Design	Sample	Independent variables	Dependent variables	Statistical tests	Results	Strengths	Weaknesses	Clinical outcomes
Quigley, P. A., & White, S. V. (2013). Hospital-based fall program measurement and improvement in high reliability organizations. *Online Journal of Issues in Nursing*, *18*(2), Manuscript 5. https://doi.org/10.3912/OJIN.Vol18No02Man05	Applying the concepts of high-reliability organizations to fall prevention programs	Comparison of fall and injury measures by organizations	Five national organiza-tions	Fall prevention programs	Falls, injuries from falls, and cost of falls	Donabedian's framework for measurement including structure, process, outcome, and balancing measures	Meaningful use of program evaluation that includes in-depth data as core data, enhanced by additional data analysis, will help nurses and hospital staff evaluate the impact of interventions. While these examples are hospital-level, this expanded analysis could occur at the unit level and be compared across units or based on specific populations.	Meaningful use of program evaluation that includes in-depth data as core data, enhanced by additional data analysis, will help nurses and hospital staff evaluate the impact of interventions.	At this time, no hospital-based study has examined the effectiveness of both fall prevention and protection from injury, nor have researchers estimated the relative weight of intervention components to outcomes.	Increasing regulatory and reimbursement changes challenge the health care industry to reduce adverse hospital conditions. Yet the measurement systems utilized for performance remain at the aggregate level, not affording precise evaluation of program changes and measurement.

Appendix B: Medication Side Effect Information Sheet

This sheet provides information about the most common side effects associated with medications you may receive during your stay. If you have any questions or concerns, please ask your nurse.

Use	Medication: Generic (Brand)	Most Common Side Effects
Pain 	Examples: • Fentanyl • Hydrocodone/ Acetaminophen (Vicodin®, Lortab®, Norco®) • Hydromorphone (Dilaudid®) • Morphine • Oxycodone/ Acetaminophen (Percocet®) • Tramadol (Ultram®)	 Constipation Nausea/Vomiting Rash
Nausea/Vomiting 	Examples: • Ondansetron (Zofran®) • Promethazine (Phenergan®) • Scopolamine patch • Reglan	 Constipation Fatigue
Heartburn or Reflux 	Examples: • Pantoprazole (Protonix®) • Ranitidine (Zantac®) • Famotidine (Pepcid®) • Esomeprazole (Nexium®)	 Diarrhea
Decrease Cholesterol 	Examples: • Atorvastatin (Lipitor®) • Lovastatin (Mevacor ®) • Pravastatin (Pravachol®) • Rosuvastatin (Crestor®) • Simvastatin (Zocor®)	 Muscle pain 
Blood Thinner to Prevent or Treat Blood Clots 	Examples: • Enoxaparin (Lovenox®) • Heparin • Dabigatran (Pradaxa®) • Warfarin (Coumadin®) • Rivaroxaban (Xarelto®)	
Prevention of Blood Clot Formation 	Examples: • Aspirin • Clopidogrel (Plavix®) • Prasugrel (Effient®) • Ticagrelor (Brilinta®)	 

Heart Failure; Heart Rhythm Abnormalities 	Examples: • Amiodarone (Pacerone®) • Digoxin (Digitek®) • Sotalol (Betapace®) • Propafenone (Rythmol®) • Flecainide (Tambocor®)	MAY CAUSE DIZZINESS OR DROWSINESS MAY CAUSE HEADACHE
Decrease Blood Pressure and Heart Rate 	Examples: • Diltiazem (Cardizem (CD)®, Cartia XT®, Tiazac®, Dilacor XR®) • Verapamil (Calan®, Verelan®, Isoptin®)	MAY CAUSE DIZZINESS OR DROWSINESS MAY CAUSE HEADACHE
Decrease Blood Pressure & Heart Rate; Heart Attack & Heart Failure 	Examples: Beta Blockers: • Atenolol (Tenormin®) • Carvedilol (Coreg®) • Metoprolol (Lopressor®, Toprol XL®) • Propanolol (Inderal®)	MAY CAUSE DIZZINESS OR DROWSINESS
Decrease Blood Pressure; Heart Attack and Heart Failure 	Examples: ACE Inhibitors or Angiotensin Receptor Blockers: • Benzapril, Captopril, Enalapril, Lisinopril, Quinapril, Ramipril • Irbesartan (Avapro®), Olmesartan (Benicar®), Valsartan (Diovan®)	MAY CAUSE DIZZINESS OR DROWSINESS Cough
Antibiotic for Bacterial Infections 	Examples: Sulfamethxazole (Bactrim®) • Amoxicillin/Clavulanate (Augmentin®) • Cefazolin (Ceftin®) • Ceftriaxone (Rocephin®) • Cefotetan or Cefoxitin • Clindamycin (Cleocin®) • Ciproflaxacin (Cipro®) • Levofloxacin (Levaquin®) • Metronidazole (Flagyl®) • Piperacillin/Tazobactam (Zosyn®) • Vancomycin (Vancocin®)	MAY CAUSE GI UPSET Rash / Flushing MAY CAUSE HEADACHE
Anti-Inflammatory 	Examples: Celecoxib (Celebrez®) • Nambumetone (Relafen®) • Meloxicam (Mobic®) • Hydrocortisone (Cortef®) • Ibuprofen (Motrin®) • Ketorolac (Toradol®) • Prednisone- Steroids	MAY CAUSE GI UPSET Insomnia
Anti-Anxiety, Sedation or Insomnia 	Examples: Alprazolam (Xanax®) • Diazepam (Valium®) • Lorazepam (Ativan®) • Midazolam (Versed®) • Trazadone (Desyrel®) • Temazepam (Restoril®) • Zolpidem (Ambien®)	MAY CAUSE DIZZINESS OR DROWSINESS MAY CAUSE HEADACHE

Note. Developed for all hospitals in the same division as the project facility for use with patient education.

Appendix C: Postfall Form

Date of Fall: _____Time of Fall: _____ Unit: _____ Unit Census at time of fall: _____ Room: _____

Staff Involved: _____ Nurse (staff)/patient ratio: _____ Diagnosis: _____

Last Known VS: Temp ____ BP_____ HR_____ RR _____ SaO2_____ **Post-Fall VS:** Temp ____ BP_____ HR_____ RR _____ SaO2____

FSBS _____ Neuro Assessment (circle): Unchanged Change Noted ☐ CT Ordered ☐ X-ray Ordered

Name of Provider Responding: _____ Family Contacted? **YES NO** Name/Relationship: _____/_____

Fall Witnessed? YES NO Fall Assisted? YES NO Injury? YES NO if injury describe _____

Nursing Assessment, Documentation and Implementation Review
(to be assessed in collaboration with the Physician, House Supervisor, Charge nurse and Primary Nurse)

Please describe the events leading up to the fall:

Last Safety Round completed?	Documented Time : _____ Safety Round completed by:_____
Patient with a history of falls?	YES NO If YES, date of last fall:
Had patient activated call light just prior to fall?	YES NO
Was patient assessed as at risk for fall prior to fall?	YES NO
What fall prevention tools present?	***(Check ALL that apply)*** ☐ Non-slip socks ☐Bed/Chair Alarm ☐ Bed Lowered ☐ Bed to wall Connection ☐ Wrist band ☐ Call light within reach ☐ Sitter Present ☐ Blue Socks ☐ Yellow Socks ☐ Safety/assistive devices in place ☐ Gait belt ☐ Wheel Chair ☐ Walker ☐ Bedside Commode Other:
Environment was uncluttered and free of trip/slip hazards?	YES NO
Was the Falls Contract Signed?	YES NO N/A (outpatient) ***(If No, indicate why)***
What interventions were not in place prior to the fall to prevent further falls or injury related to falls for this patient?	***Describe:***
EBCD Post Fall Assessment Completed: YES NO	**Occurrence Report (OCR) Completed: YES NO**
EBCD Post Fall Assessment Assigned to: _____	Occurrence Report Submission Assigned to: _____

OTHER COMMENTS:	**What Equipment was used to assist the patient back to bed/chair?** **Hoyer Lift** - regular up to 350lb, Maxi Move - up to 500lb (located in 3T Equipment Room) **Sara Stedy** - up to 400 lb **Sara Plus** - up to 420lb – (Located in CCU Clean Equipment room) **Hover Mat** –used for patients over 200lb **Y N** - Was a request made for additional staff to assist in moving patient?
Team Assist Respondents (Please Print Full Name) Physician/Resident_____ Primary RN/Caregiver_____ Charge RN/Lead -_____ House Supervisor	**Patient ID Label** *If visitor fall (please answer questions below)* Visitor Name: _____ Witnessed / Unwitnessed Visitor taken to ER: **YES NO**

For Performance Improvement Purposes; Updated 06/01/2020 Not a permanent part of medical record.

Note. Developed by the parent corporation of the project facility for use by affiliate hospitals.

Appendix D: Fall Contract

Patient and Family Guide to Fall Prevention

All patients are at risk for falling. You're more likely to fall due to physical changes affecting vision and balance. This can be due to various medical conditions, unfamiliar surroundings and medications you may be taking. If you have had even a minor fall in the past, you should notify a member of your healthcare team.

Falling increases your risk for injury, even severe injury, and may prolong your hospital stay. Many falls and fall related injuries are preventable.

Fall prevention is everyone's responsibility

What you can do:

- Ask for assistance before you get out of the bed/chair or even if you sit at the edge of the bed.
- Anticipate your needs. Give yourself plenty of time to perform tasks.
- Always wear non-skid socks, slippers or shoes before standing.
- Do not get out of bed or off the toilet without assistance.
- Use your walker or cane.
- Communicate your needs with your caregiver/family and healthcare team.
- Wear your glasses and hearing aids.

What your caregiver/family can do: _ Check if caregiver/family not present

- Advise healthcare team member when you will be leaving.
- Remind patient to use the call light or phone to call healthcare team directly for assistance.
- Remind patient to ALWAYS ask for assistance when getting out of the bed or thechair.
- Wait for staff to assist the patient.
- Encourage the patient to participate in therapy services and activity throughout the day.
- Do not tum off alarms.
- Have a caregiver/family member present as much as possible.

What your healthcare professionals will do:

- Orient you to your room and provide phone numbers on the communication board for direct access to your healthcare team.
- Round hourly and anticipate your needs.
- Set up regular toileting schedules.
- Raise the side rails for access to bed controls.
- Evaluate bed height and adjust accordingly.
- Provide non-skid footwear.
- Eliminate obstacles in the room.
- Promptly respond to call light.
- Ensure alarms are on.
- Place your phone within reach.
- Remove fall mat before ambulation.

Remember,
SAFETY TRUMPS PRIVACY
This means if you are identified as a high risk for fall with injury, we will remain within sight while you are toileting or showering. If you are using the bedside toilet, we will stay with you for your safety.

The above information has been reviewed and a copy provided to the patient/family.

Patient/Family Signature:_____Date:__ _

Note. Developed for use at the project facility.

Appendix E: IRB Approval

ABILENE CHRISTIAN UNIVERSITY
Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs
320 Hardin Administration Building, ACU Box 29103, Abilene, Texas 79699-9103
325-674-2885

October 27, 2021

Constance Cannon
Department of Nursing
Abilene Christian University

Dear Connie,

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled "Reducing Inpatient Falls and Falls with Injury",

(IRB# 21-148)is exempt from review under Federal Policy for the Protection of Human Subjects as:

☐ Non-research, and
☑ Non-human research

Based on:

Research does not involve interaction or intervention with living individuals, and the information being collected is not individually identifiable [45 CFR 46.102(f)(2)]

If at any time the details of this project change, please resubmit to the IRB so the committee can determine whether or not the exempt status is still applicable.

I wish you well with your work.

Sincerely,

Megan Roth

Megan Roth, Ph.D.
Director of Research and Sponsored Programs