Fall 12-13-2014

Implementation of Best Practices for Fall Prevention in a Community Hospital

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Doctor of Nursing Practice Translational Research and Clinical Project
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Dedication Page

I would like to give a special thank you to my wonderful family Terrell, Lauren, Tyler Jacobs and Chelsey Smith for their personal support and inspiration. I would also like to thank my mother Phyllis Trice-Garrison, son-in-law Jason Smith, Titus Jackson, George Johnson, Carol Brown, friends, South Georgia State College faculty, Georgia College faculty and my committee members who have been a source of support and encouragement during the completion of my scholarly project.

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Abstract

Prevention of inpatient falls remains a challenge for nurses. Despite fall prevention efforts by nurses, the rate of patient falls in the acute care setting is a major safety concern. The aim of this translational project is to implement an evidence-based fall prevention program at a small community hospital, based on the Morse Fall Scale with targeted interventions to decrease fall rates. Research indicates the best practices for nurses to manage patients at-risk for falls and using fall prevention strategies that will keep patients safe from falls during hospitalization. The three phases of this project, included development of the fall-risk program in the Paragon Electronic Medical Record, implementation of an educational intervention, measurement of program compliance and fall rate outcomes. The fall-risk program was effective in decreasing the fall rate from 1.4 to 0.0 falls per 1,000 patient days for two consecutive months after the implementation the educational intervention. Results from this project support the use of the Morse Fall Scale with evidence-based targeted interventions to decrease fall rates.

Keywords: falls in acute care setting, targeted fall prevention interventions, fall-risk assessments, fall prevention, Morse Fall Scale

Implementation of Best Practices for Fall Prevention in a Community Hospital

Hospitalized patients are a vulnerable population for experiencing a fall. The rate of patient falls resulting in injury while in the acute care setting is a major safety concern that may affect a hospital's accreditation and reimbursement. There is an expectation that hospitals are to keep patients safe from further complications and injuries during hospitalization. The Joint Commission's (2013) National Patient Safety Goal 9 (NPSG) requires the implementation of a Fall Reduction Program, and states that "a fall reduction program must include a risk assessment of individual patients and the environment of care to reduce the risk of patient harm resulting from falls" (para. 4). The American Nurses Association views the incidence of falls as a nursing quality indicator that has linked nursing interventions to patient outcomes (American Nurses Association, 2010). Despite fall prevention efforts by nurses, there continues to be a problem with patient falls occurring at a high rate in the acute care setting (Tzeng, Hu, & Yin, 2011). This study addressed the implementation of a new fall risk program. The program was implemented over three phases to include planning, implementation and evaluation.

Background and Significance

While hospitalized, approximately 3-20% of inpatients slip and fall, and an estimated 11,000 fall-related deaths occur annually (Centers for Disease Control, 2009). Fractures, hematomas, traumatic brain injuries, and deaths are some of the unintentional outcomes from fall injuries that increase morbidity and mortality rates. Fall-related injuries have been show to increase patient length of stay by an average of 6.3 days (The Joint Commission, 2013). Patient falls cost hospitals on average $17,500 per fall-related injury. The Centers for Medicare & Medicaid Services (CMS) limits reimbursement for

falls resulting in injuries, and many of the costs associated with inpatient falls become the financial responsibility of the hospital (Centers for Medicare and Medicaid Services, 2009).

The incidence rates of hospital falls have been reported to range from 1.3 to 8.9 per 1,000 patient days (National Quality Measures, 2012). Research has shown that lack of risk identification and lack of implementation of effective fall-risk measures are major causes of inpatient falls (Nassar, Helou, & Madi, 2013; Yoon Sook & Smi, 2013; Zuyev, Benoit, Chang, & Dykes, 2011). The Centers for Medicare & Medicaid Services require hospitals to report patients' existing conditions upon admission (Centers for Medicare and Medicaid Services, 2009). The Joint Commission's (2013) National Patient Safety Goal 9 requires hospitals to use valid and reliable fall-risk assessment tools as a guideline for identifying existing fall-risks upon patient's admission to the hospital, and plan interventions to address those risks.

Setting

The setting for this evidence-based translational project is a rural community hospital in southeast Georgia. Two 22-bed medical/surgical units were included in the study. The community hospital has approximately 630 admissions monthly. The hospital administration and Fall Committee members immediately sought to improve the fall prevention program after a survey visit from The Joint Commission that identified issues with the current program. These issues included the utilization of an unreliable fall-risk assessment tool, lack of documentation of an effective fall prevention care plan, and concern about the rate of falls and injuries resulting from falls that occurred mainly on the medical and surgical units.

History of Fall Prevention Practice

In the past, the hospital used a computerized fall-risk assessment tool developed by the hospitals' Fall Committee. The tool utilized a combination of screening methods. Nurses completed fall-risk assessments only upon admission. The patient was considered a fall-risk only if the fall-risk score was ≥5. For example, a patient with a history of falls in the last three months, or a patient older than 65 would score higher than five and therefore was identified as a fall-risk.

With the previous Fall Prevention Program, interventions for anyone on fall precautions were the same. These interventions included hourly rounds to patient rooms, validating that the call light was in reach, maintaining beds in the lowest position, and turning on bed alarms on all beds at bedtime. The patient would wear yellow socks, and a yellow fall-risk armband; also, a yellow fall-risk sign was placed on the door. No interventions were targeted to the patient's specific identified fall-risk, interventions were the same regardless of patients' fall-risk or total fall score.

Need for Project

The community hospital identified a need to make changes to the Fall Prevention Program after a survey visit by The Joint Commission. The hospital did not meet the Joint Commissions' National Patient Safety Goal 9 expectation of using a valid fall-risk assessment tool to identify patients at-risk for falls, decrease the rate of falls, or to decrease the number of falls resulting in injury.

This translational project was implemented with the support of the Fall Prevention Committee in order to decrease the rate of falls, and comply with the Joint Commission's recommendations. Best practices for identifying patients at-risk for falls were identified,

and the results were presented to the committee. These best practices include implementing use of a valid fall-risk assessment instrument with targeted interventions.

Challenges and Opportunities of the Project

The researcher was challenged to find a valid and reliable fall-risk assessment tool that fit the facility needs and a process to integrate the fall prevention program into the Paragon Electronic Medical Record (EMR). The researcher worked with the hospitals' Information Technology and Education Department to create a seamless transition to the new Fall Prevention program by defaulting targeted fall prevention interventions into the Paragon EMR. The Paragon EMR has the capability of defaulting interventions based on identified fall-risks selected by the nurse using the Morse Fall Scale. The use of the EMR made it easier for the nurses to learn the new fall risk program.

Decreasing the fall rate less than 1.4 per 1,000 patient days was another challenge for the researcher. Since the medical and surgical units had the highest patient fall rates and most severe injuries from falls in the facility, the primary strategy for evaluating the effectiveness of the program focused on patients admitted to the medical and surgical units. The new Fall Prevention Program provided an opportunity to improve patient outcomes in fall-risk patients by decreasing fall rates, decreasing the rate of fall-related injuries, and improving inter-departmental and multidisciplinary care of fall-risk patients in the acute care setting.

Project Purpose

The purpose of this translational project was to implement an evidence-based fall prevention program based on the Morse Fall Scale with targeted interventions to decrease fall rates in a community hospital. Although the hospital's fall rate was low, hospital

administration wanted to lower it further. The hospital administration anticipated that this project would address the problem with falls on the medical and surgical units.

Clinical Questions

The clinical questions for this study are:

1. What is the effectiveness of the educational intervention in increasing nurses' knowledge of the fall risk program?
2. What is the compliance rate with the fall risk program at 2, 4, 6, and 8 weeks after the Morse Fall Scale with targeted fall prevention education sessions?
3. Does the implementation of the Morse Fall Scale paired with targeted fall prevention interventions result in a decreased rate of falls?

Theoretical Framework

Implementation of the hospital's new fall-risk program was expected to involve challenges. The Rogers' Diffusion of Innovation Theory was used to manage those challenges because the theory conceptualizes how new ideas are implemented and adopted by people in various specialties (Rogers, 1995). Rogers refers to "the process in which an innovation is communicated through certain channels over time among the members of a social system," and he asserts that "diffusion is a special type of communication process concerned with how new ideas are perceived," (Rogers, 1995, p. 5). Rogers' five phases of the innovation process were applied when introducing the new fall prevention program, which was built around the Morse Fall Scale. According to Rogers (1995), the five phases of innovation are the following:

- Knowledge—the awareness of the innovation's functions are understood.

- Persuasion—a positive or a negative attitude about the innovation is formed.
- Decision—the engagement or the lack of engagement in the process leads to the innovation's acceptance or rejection.
- Implementation—the innovation is employed and the determination of its effectiveness is obtained.
- Confirmation—the evaluation of the innovation's outcomes confirms the right decision was made and finalizes the decision to continue the innovation.

In applying Rogers' Diffusion of Innovation Theory to this project, provision of educational sessions began the knowledge phase according to Rogers' Theory (Rogers, 1995). Nurses' knowledge about the Morse Fall Scale (MFS) and how to target fall prevention interventions was crucial for the successful implementation of this innovation (Rogers, 1995). Evidence-based research regarding the advantages of the new fall prevention program was used as the persuasion phase of the project. Rogers found that variables in the nurses' personalities and experiences could influence this stage (Rogers, 1995).

Readiness of the nursing staff to begin the implementation of the new fall prevention program was important during the decision stage. The hospital was on a time constraint with the expectation of a return visit from The Joint Commission; therefore, a quick acceptance and decision to implement the new fall prevention program was imperative. The electronic health record monitored nurses' documentation and implementation of the Morse Fall Scale with targeted interventions using the Nursing Fall

Risk Management Audit Tool. During the confirmation stage, comparing the historical fall rate gathered from the previous 12 months to the fall rate at one month and two month periods after the implementation of the fall risk program was planned to evaluate the effectiveness of the intervention. The reduction in the fall incidence rate would necessitate the adoption of the new fall prevention program. An increase in fall incidence rates could result in a decision to initiate more education sessions or to re-design the fall prevention program. Utilizing the phases in the Rogers' Diffusion of Innovation Theory as the theoretical framework guided the steps of implementation and evaluation of this projects' fall prevention program.

Review of Literature

A literature search was conducted to identify the best practices for decreasing falls in the inpatient setting. Keywords used were fall and acute care setting, fall prevention interventions and acute care setting, fall-risk assessments and acute care setting, fall prevention and acute care setting, and Morse Fall Scale and targeted interventions. A total of 2,201 citations were retrieved using the PubMed, CINAHL, and Medline databases. Citations excluded were 1,086 due to duplication and 1,061 studies that were not full-text, not related to the topic, or scholarly peer review journals. Fifty-six articles were identified that provided strong evidence on fall risk assessments, fall prevention interventions, targeting fall prevention interventions and best fall prevention practices to support measures to decrease falls. These articles included 5 systematic reviews, 17 randomized control trials, 13 quasi-experimental studies, and 2 qualitative studies. This review of literature will discuss various patient fall-risks, environmental risks, and variations in recommended interventions.

Why Do Patients Fall?

Patient's slip and fall due to a variety of reasons while hospitalized. Although the reasons for falls vary, there are trends in the literature of common fall-risks found in patients that have experienced falls (Abreu, Mendes, Monteiro, & Santos, 2012; Laktos et al., 2009; Morse, Tylko, & Dixon, 1987).

Tzeng and Yin (2010) conducted a study in six adult acute care units and found that patients who had mental status deficits (MSD), such as cognitive impairments, confusion, or dementia, were themselves the major cause of 34% of the falls, due to their inability to follow instructions. A significant number of patients who were presenting with MSD in the acute care setting included patients who were ≥65 years of age, had a history of falls, and suffered severe injuries from their falls. Results from one study found that 1,815 medical, surgical, oncology, or critical care patients were identified as having internal (intrinsic) and environmental (extrinsic) risk factors (Nassar et al., 2013). Although nurses used their clinical assessment skills to assess patients fall-risks at the time of admission, Nassar and colleagues found that patients using antiepileptic drugs and mobility assistive devices had a higher incidence of falls, stressing the importance of reassessing fall-risk for changes during hospitalization, as a patient's condition or risk factors change (Nassar et al., 2013).

Risk factors for inpatient falls, include a mean age of 65, history of falls, use of ambulatory aids, intravenous (IV)/heplock therapy, altered mental status, secondary diagnoses, and medication side effects (Salarvand, Meraci, Ghaedi, & Zamani, 2010). Patients with secondary diagnosis secondary diagnosis are at increased risk for falls (Swartzell, Fulton, & Friesth, 2013). When patients with secondary diagnosis were not

identified as a high fall risk, 44% of them experienced a fall. The factors that contribute to falls are complex and interrelated. Patients are more at-risk to fall while hospitalized due to acute illnesses, secondary diagnosis, certain medications, and being in a new environment (Shever, Titler, Mackin, & Kueny, 2011). According to the research, fall-risk scores are related to the rate of falls, thus, it is an important skill for nurses to learn how to accurately identify patients that are prone to falling (Chapman, Bachand, & HyrkÄS, 2011).

In Korea, when 147 patients who fell were compared to 147 patients who did not fall, the researcher found that the patients who fell had higher fall-risk scores using the Morse Fall Scale upon admission than patients who did not fall (Yoon Sook & Smi, 2013). Differences in fall-risk factors, such as visual disturbances, pain, elimination issues, and emotional disturbances, are other characteristics found in patients that are prone to falling (Yoon Sook & Smi, 2013).

Risk-factors for falls may be categorized into intrinsic and extrinsic factors. Intrinsic factors originate within the body (medication use, muscle weakness, visual disturbances, balance and gait abnormalities, advanced age, cognitive impairment, existence of one or more secondary diagnosis), and extrinsic factors originates outside the body (improper lighting, ambulating without assistance or assistive devices, restraint use) patient risk factors are measured by fall-risk assessment tools producing a fall-risk score (Choi et al., 2011).

Intrinsic conditions, such as confusion, gait imbalances, and agitation are major risk factors that lead to the patients' accidental falls (Abreu et al., 2012). Extrinsic conditions such as poor lighting, clutter, trip and slip hazards, staff shortages and

equipment malfunction also contribute to patient falls (Miake-Lye, Hempel, Ganz, & Shekelle, 2013).

Measures to Assess Fall-risk

While it may not be possible to totally eliminate falls in the inpatient setting, falls may be reduced through measures put in place to assess risks for falls using valid and reliable fall-risk assessments of patients and their environments (Choi, Lawler, Boenecke, Ponatoski, & Zimring, 2011). When deciding which fall-risk assessment tool to use in assessing patient fall-risks, the instrument that has the highest specificity and sensitivity in detecting fall-risk would be the best choice (Boyé et al., 2013; Choi et al., 2011; Rowe, 2013; Wexler et al., 2011).

A valid and reliable fall-risk assessment tool is required to meet the Joint Commission's patient safety standard that states, "Reduce the risk of patient harm resulting from falls, using a valid fall-risk assessment at the time of admission" (The Joint Commission International, 2010). However, finding a tool that can identify patients at-risk for falls in the hospital setting may be challenging.

The Morse Fall Scale (MFS), the St. Thomas Risk Assessment Tool in Falling (STRATIFY), and the Hendrich II Falls Risk Model (HIIFRM) are the top three fall-risk assessment tools found in the literature used in the hospital settings (Boyé et al., 2013; Healey, 2010; Morse et al., 1987; Shever et al., 2011; Swartzell et al., 2013). The MFS (see Appendix A) is a six-item index tool with weighted scores (0 to 125), and a reported sensitivity of 79% and specificity of 82% (Morse, Morse, & Tylko, 1989). The MFS has been used successfully in a variety of community hospital settings (Boyé et al., 2013; Morse, 2006). Yoon Sook and Smi's (2013) identified the effectiveness of the Morse Fall

Scale on identifying falls among hospitalized inpatients. STRATIFY, frequently used on the older adults in an acute care setting, includes five factors, with a reported sensitivity of 93% and specificity of 68% (Oliver, Healey, & Haines, 2010). STRATIFY was found to be effective in predicting falls in the elderly and in long-term facility settings (Billington, Fahey, & Galvin, 2012; Oliver et al., 2010). HIIFRM has seven weighted items, with a reported sensitivity of 77% and specificity of 72% (Hendrich, Bender, & Nyhuis, 2003). Large education hospitals found the HIIFRM to be very effective (Ang et al., 2011). The sensitivity and specificity measurements aid researchers in determining the predictive value of the fall-risk assessment tool.

Literature on the various fall-risk assessment tools stresses the importance of evaluating the population, clinical setting, and tool specificity when determining which tool would be most appropriate to implement in a fall prevention program (Aranda-Gallardo et al., 2013; Baek, Piao, Jin, & Lee, 2013; Billington et al., 2012; Chapman et al., 2011). The MFS was developed through rigorous research methods and has shown its usability with the electronic medical record on medical and surgical units (Baek et al., 2013; Morse, 2009; Morse et al., 1989; Morse et al., 1987; Sung et al., 2013). By using the MFS, hospitals are permitted to calibrate the scale so that fall prevention interventions are aimed toward patients most at risk (José Martins da Costa-Dias, Martins, & Araújo, 2014).

Fall Prevention Interventions

Common fall prevention interventions include using bed alarms, lowering patients' beds, keeping patients' call lights within their reach, recommending sitters to families, rounding in patient rooms, using restraints, and keeping the at-risk patient near

the nurses' station. However, there are gaps in the research related to which interventions achieve the best fall prevention outcomes (Shever et al., 2011). Interventions are categorized as addressing either intrinsic or extrinsic reasons for falls. Several researchers recommend individualizing the interventions to the intrinsic and extrinsic categories in order to meet the patient's specific intervention needs (Ang et al., 2011; Dykes, 2012).

Pharmaceutical Interventions. Patients receiving multiple medications, including medications given intravenously, could be at an increased risk for fall due to the medication's side effects. Pharmaceutical interventions such as daily medication reviews and modifications may reduce falls by over 40% (Choi et al., 2011). Research has shown that the best pharmaceutical interventions are (1) listing medications that have side effects associated with dizziness or drowsiness, (2) educating patients and nursing personnel about medication related falls, and (3) communicating with pharmacists and doctors about daily updates (Graham, 2012). Literature indicates that visual signals like fall-risk identification bracelets and employing technological interventions like using call bells, bed alarms, and maintaining beds in low position combined with nurses going in patients' rooms prevents falls related to medication side effects (Choi et al., 2011; Graham, 2012; Healey, 2010; Oliver et al., 2010). Toileting interventions may be necessary for patients taking medications, which increase urinary frequency. The implementation of a bladder or bowel program, use of a bedside commode, or keeping the patient's urinal or bedpan within reach may decrease falls (Tzeng & Yin, 2010).

Balance and Gait Interventions. Physical therapy interventions have been shown to be effective in preventing falls for patients who receive balance exercises and gait training (Tousignant et al., 2012). However, research findings suggest that physical

therapy is more effective when implemented along with other interventions, such as the use of assistive devices, wearing glasses or hearing aids, putting beds in the low position, uncluttering the room, assisting the patient when out of bed, and using non-slip footwear (Choi et al., 2011; Naqvi, Lee, & Fields, 2009; Rowe, 2013; Tousignant et al., 2012). Literature also suggests that Vitamin D is an effective intervention to reduce the risk of falls in patients with gait impairment due to muscle weakness (Muir & Montero-Odasso, 2011).

Cognitive Impairment Interventions. Inpatients with cognitive impairment (CI) or altered mental status are prone to falls, injury from falls longer lengths of stay, and other hospital-acquired complications (Boustani et al., 2012). The early recognition of altered mental status or impaired cognition is a very important intervention strategy for reducing fall-risk (Quinn & Horgan, 2013). Patients with cognitive impairments have problems with recognizing their own limitations and capabilities, and have faulty judgment. However, a proper mental status examination should detect cognitive impairments (Quinn & Horgan, 2013). Research recommends reviewing the patient's medications for drugs that would further impair cognition (Boustani et al., 2012; Lamis, Kramer, Hale, Zackula, & Berg, 2012). Some interventions - such as using sitters, placing patients closer to the nurses station, using fall-risk signage, rounding frequently in the patient's room, providing bed and chair alarms, and using bedrails are more effective than the use of physical or chemical restraints to decrease the risk of falls in the cognitively impaired inpatient (Boustani et al., 2012; Healey, 2010; Lakatos et al., 2009; Shorr et al., 2012).

Secondary Diagnosis. Secondary diagnosis is a disorder or disease that may exist with a primary disease or disorder and is considered a co-morbidity due to the effect of additional disorders or diseases on patients (Morse, 1989). Secondary diagnosis, such as heart failure, post-stroke, diabetes, pain, and dementia, increase the risk of fall for patients already impaired by other factors (Kuys, van der Ham, Hwang, Adsett, & Mandrusiak, 2013; Schmid et al., 2013). Literature suggests that patients with secondary diagnoses, like congestive heart failure for instance, may have medical conditions that affect muscle strength, gait, cognition, and are more likely than other patients to be exposed to medical issues related to polypharmacy (Jones & Whitaker, 2011; Schmid et al., 2013). Upon admission, it is important to identify patients with secondary diagnoses as being at increased risk for falls (Kuys et al., 2013).

History of Falling. When patients report a history of falls, it is important to identify the factors that led to the previous falls in order to target interventions and prevent recurrent falls (Jones & Whitaker, 2011). One study found a relationship between a patient's history of falls and an 85% prediction that a future fall is likely to recur without targeting interventions toward fall-risks that previously and currently existed (Greany, 2010). It is important that the multidisciplinary team is aware of the predisposing factors of the patient's fall history so that all members of the team may be informed to avoid fall triggers, and to use targeted interventions to decrease fall-risk (Greany, 2010).

Environmental Assessment and Ambulatory Aids. Research has shown that environmental factors such as cluttered rooms, rooms that are not well lit, beds left in a high position, ambulatory aids not left within the patient reach and medical equipment

left in the pathway to the restroom can result in falls (Choi, et al., 2011; Graham, 2012). Nursing interventions such as using night lights, making rounds to patient rooms to assess the environment for safety hazards and unclutter the patient's room, using fall-risk signage, adjusting beds to the lowest position, remove medical equipment out of walking paths have shown to be effective (Choi, et al., 2011; Graham, 2012).

Environmental modifications to fit individual fall prevention needs include incorporating grab bars in the bathroom and use of mobility assistive devices in the acute care setting (Graham, 2012). It is important to make sure that assistive devices are within comfortable reach of the patient. It is also important that assistive devices are in working order prior to use in order for environmental interventions to be effective in reducing fall-risk.

Nursing Expertise and Fall Prevention

Challenges that nurses have identified with fall prevention programs include finding effective ways to identify patients at-risk for falls and implementing fall prevention strategies that will keep patients safe from falls during hospitalization (Rush et al., 2009). Nurses have exhibited different levels of skill in fall-risk assessment (Dempsey, 2009). Nurses with less skill at identifying fall-risk may put patients at higher risk for falls. Nurses' fall- risk assessment knowledge and skills are crucial in identifying the elements that may or may not require appropriate nursing interventions, thus reducing the incidence and severity of falls. The adoption of a fall risk program will necessarily involve ensuring that nursing staff are educated about the fall assessment program and interventions.

Best Practices for Fall Prevention

When patients are identified as at-risk for falls, healthcare facilities implement measures to minimize this risk. While some facilities apply a given set of interventions to all patients at-risk for falls, research supports that interventions targeted to specific fall-risk factors are more effective (Ang, Mordiffi, & Wong, 2011). Where fall prevention interventions may be implemented on any patient identified as a fall risk, targeted interventions are implemented according to each fall- risk identified from a valid fall-risk assessment tool. Falls may be reduced up to 31% by implementing multifactorial targeted fall prevention interventions on fall-risks identified by a fall-risk assessment tool (Choi et al., 2011).

Research literature supports the use of a valid and reliable fall risk assessment instrument combined with targeted interventions to reduce inpatient falls (Aranda-Gallardo et al., 2013; Rush et al., 2009). Fall-risk scores are based on the clinical assessment skills that nurses use to assess intrinsic and extrinsic risk factors for falls. Implementing a targeted fall prevention program is more effective when nurses' knowledge is increased on the proper use of the fall-risk assessment tool and targeted interventions to be utilized (Koh, Hafizah, Lee, Loo, & Muthu, 2009).

Implementing targeted interventions is different than implementing universal fall precautions. Ganz et al. (2013) define universal fall precautions as fall prevention interventions that are implemented regardless of specific fall-risk to prevent falls. Variations in the implementation of universal fall precautions result in inconsistencies in methods used to identify fall-risk patients, and in the use of effective fall prevention interventions (Ganz, Huang, Saliba, & Shier, 2013). Common universal fall precautions

include conducting hourly rounds in patient rooms; using bed alarms; maintaining beds in low position; and using fall-risk indicators on patient's armbands and room doors to queue staff to patients' fall-risk (Ganz et al., 2013; Shever et al., 2011). A good fall-risk assessment tool identifies the patient's risk factors resulting in an individualized number that gives the nurse a specific patient's fall-risk score (Morse, Morse & Tylko, 1989; Morse, 2009). Researchers found that failure to use a valid and reliable fall risk assessment tool with targeted interventions resulted in poorer patient outcomes (Shever et al., 2011).

One randomized control trial with 1,822 participants examined the effectiveness of targeted interventions to reduce the fall rate. The control group (n=912) received universal fall precautions and the intervention group (n=910) received targeted multiple interventions. The fall incidence rates were 1.5% in the control group and 0.4% for the intervention group. Implementing multiple targeted interventions was found to be effective in reducing the incidence of falls in the acute care setting (Ang et al., 2011). Day (2013) found that multiple targeted interventions were more effective in decreasing falls than a single intervention, and that interventions should be customized to meet the individual's fall-risk need. Another randomized controlled trial in Asia with 266 participants measured the effect of multiple targeted interventions on the fall rate, and found that targeted interventions alone reduced the fall rate but not the fall-risk. This study further validated the use of a valid and reliable fall-risk assessment tool used with targeted interventions (Pey et al., 2014). A systematic review and meta-analysis of 18 papers reporting 17 randomized controlled trials found evidence that targeted interventions tailored to patient's fall-risks were effective at decreasing the fall rate and

the fall-risk if multiple interventions are used. This approach should be considered as a best practice model (Goodwin et al., 2014).

The best practices for preventing falls in the acute care setting are using targeted fall prevention interventions identified by a valid and reliable fall-risk assessment tool (da Costa-Dias & Lopes Ferreira, 2014; McFarlane-Kolb, 2004; The Joint Commission, 2013). The Morse Fall Scale was found to be a reliable and valid fall-risk assessment tool (Aranda-Gallardo et al., 2013; Baek et al., 2013; Chapman et al., 2011). Fall-risk assessments should be performed not only at the time of hospital admission but as changes in the hospitalized patient occurs (Aranda-Gallardo et al., 2013). Otherwise, changes in a patient's fall-risk may be overlooked. Once fall-risk factors are identified, multiple interventions are effective when targeted at the specific fall-risk factor (Ang et al., 2011; Dykes, 2012; Russell et al., 2010). Studies that have used a fall-risk assessment tool like the Morse Fall Scale, along with targeted interventions, found targeting interventions to specific fall-risks as the best practice for managing falls in hospitalized patients (Morse, 2009; Shever et al., 2011; Yoon Sook & Smi, 2013).

Summary

A review of the literature found support for using valid and reliable fall risk assessments. Fall risk assessments aid in planning fall prevention interventions to address the fall-risk factors resulting in a decreased incidence of falls. The results from the fall-risk assessment could be used to identify which specific fall prevention interventions are needed. A review of three common fall-risk assessments found the Morse Fall Scale to be more sensitive in addressing specific fall prevention needs in the community hospital setting. Research found 14 common interventions that were most effective in decreasing

falls, if targeted to the identified intrinsic and extrinsic fall-risks. Overall, the best practice for fall prevention is to combine a "valid and reliable" fall-risk assessment with targeted interventions.

Project Description

Setting

This translational project was conducted in a small community hospital in southeast Georgia between May 2014 and August 2014. The average daily census of the community hospital was 78 patients over the period of the study. This project was conducted on the medical and surgical units of the hospital. Each unit had 22 private rooms. In order to reduce falls, comply with the Joint Commission's requirements, and improve patient safety, the hospital's Fall Committee strategically planned to implement an evidence-based fall-risk program.

Design

This translational project included three phases. Phase 1 was the planning phase for the project. In Phase 1, a plan was developed to implement best practices to decrease falls based on the Morse Fall Assessment instrument with targeted interventions. Literature has found the Morse Fall Scale as having a 0.96 in reliability, 0.78 in sensitivity, and 0.8 in specificity (Rowe, 2013). The Morse Fall Scale has been identified as a valid and reliable fall-risk assessment tool in the literature (Baek et al., 2013; Choi et al., 2011; Morse et al., 1989; Rowe, 2013). The Morse Fall Scale has six queries resulting in a total score of 0-125 based on the nurses' fall-risk assessment. The queries include:

1) history of falling (0 or 25);
2) secondary-diagnosis present on admission (0 or 15);

3) need of ambulatory aid (0, 15. or 30);

4) IV therapy (0 or 20);

5) type of gait (0,10, 20); and

6) assessment of mental status (0 or 15) (Morse et al., 1989).

Phase 1 also included coordination with the hospital's EMR department to include the new fall prevention program in the online documentation. The hospital used the Paragon computer system for their electronic medical records. During this phase, the Morse Fall Scale assessment with targeted interventions was built as a component into the database. When nurses selected assessment findings using the MFS in the Paragon EMR, fall-risk specific, targeted interventions menus would appear. Nurses would select appropriate interventions from the menu. These interventions would become a part of the plan of care. Policies were developed regarding proper use of the instrument.

In Phase 2, the fall prevention program was introduced to all hospital staff. Nurses were required to attend training implemented by the hospital's Education Department on the new fall prevention program using the Morse Fall Scale. The researcher educated nurses in June 2014 on the new Morse Fall Scale with targeted interventions in small groups of 15 or less in six 30-minute class sessions. Nurses who attended the education sessions viewed an in-depth PowerPoint presentation on fall-risk screening and reassessment practices and Paragon EMR documentation. Nurses also received a self-learning packet with instructions on how to use the Morse Fall Scale with targeted interventions to re-enforce information learned during the educational session.

Nurses were given the opportunity to participate in the study. Participants signed informed consent forms (see Appendix C) for the study. Participants then completed the

demographic information and the pretest to measure their knowledge of the fall prevention program. Participants received the following: self-learning handouts with a pre-test, and a post-test, and documentation of multiple targeted interventions. After the educational session, participants completed the post-test. The fall-prevention program was implemented on the medical and surgical units two weeks after the completion of the educational sessions.

In Phase 3, compliance with the fall-risk program and the outcomes of the fall-risk program were measured. Compliance was monitored through random chart reviews and direct unit observation. Outcomes were measured through assessment of changes to the hospital's monthly fall rate. Charts and patient rooms were randomly selected during the two, four, six and eight week observation period to measure compliance. Depending on unit census, 10 to 20 charts and patient rooms were randomly selected and audited on each unit twice a week at the two, four, six and eight week intervals.

The researcher funded the project by paying for copy paper, food for the six educational sessions and the statistician fee. The facility made available office supplies, the copy machine and computer technology to the researcher. The researcher taught all of the intervention classes without any other personnel.

Participants

At the time of this study, the hospital employed 66 full-time and part-time medical and surgical nurses. On the surgical floor, there were 8 LPN's and 24 RN's. The medical floor consisted of 10 LPN's and 24 RN's. The medical and surgical nurses consisted of full-time and part-time staff that were cross-trained and scheduled to work both units. Medical and surgical nurses were educated on the hospital's Paragon

electronic medical record to learn online documentation of the new fall prevention program.

Nurses were required to attend the education session on the new fall prevention program using the Morse Fall Scale with targeted interventions. The researcher taught educational sessions over a three-day period. Six 30-minute classes were offered to all medical/surgical nurses employed full-time or part-time by the facility. Confidentiality was maintained by assigning a number to each informed consent form. The participants were instructed that test results would be matched with their participant number, and that only the researcher would know the identity of participants. Thirty-one nurses consented to participate in the study. In Phase 3 audits were implemented on random patient charts and patient rooms to assess for compliance with the fall prevention program. No patient identifiable data was collected.

Measurement Instruments

Measurements used in this study were created by the researcher. The instruments used in this study were the education pre- and post-test, demographic survey and the Fall Measures Audit Tool (FMAT). The FMAT (see Appendix D) was created by the researcher using the Morse Fall Scale with targeted interventions to measure compliance of fall risk program in the EMR and patient room observation.

Education Pre- and Post-test

In Phase 2, the pre- and post-test were constructed by the researcher with a structured questionnaire designed to identify nurses' knowledge of the fall prevention program. The pre-test and post-test was reviewed and assessed by experts in the field of nursing to assess usability, validity and reliability of the pre- and post-test. The experts in

the field of nursing consisted of four nurses, five nurse educators, and one nurse practitioner. To test the usability of the tests, the nurse experts took the tests and scored by the researcher. The experts in the field of nursing were asked to interpret the tests for readability, test administration methods, problems with interpretation of test questions or problems with researcher's scoring system. All of the panels of experts were able to complete the tests with ease without any recommendations.

The pre- and post-test was reviewed by a panel of nurse experts and determined to have content validity. The group of nurse experts took the pretest, attended the educational intervention, and took the post-test. As expected, scores on the post-test were improved indicating retained knowledge of the fall prevention program. The pre-test was used as baseline data to compare with that of the post-test to identify the effectiveness of the educational intervention. The pre-test and post-test asked the same 10 questions regarding the Morse Fall Scale along with targeted interventions. Questions on the pre-test and post-test ranged from multiple choice, fill-in-the-blanks, matching, and true or false. No partial points were given on items for either test. Each item on the pre-test and post-test was worth 10 points. A passing grade of 75 on the post-test did not require any remediation. Participants did not review the pre-test. Answers to the post-test were reviewed after grading the post-test. Following the post-test, remediation was provided to ensure nurses knowledge of the content.

Fall Measures Audit Tool

In Phase 3, to measure the compliance with the fall prevention program, the researcher developed an audit tool based on the fall prevention program, the Fall Measures Audit Tool (FMAT). The FMAT consisted of a chart audit component and a

compliance observation audit. The chart audit component was reviewed using the Paragon EMR. The compliance observation was completed based on unit observations. The FMAT is included in Appendix B.

Compliance with the fall-risk program was measured using the Fall Measures Audit Tool (FMAT) at two, four, six, and eight week intervals. Chart audits and room observations were conducted by randomly selecting a patient room number from an envelope with all of the room numbers. One envelope was made for the medical unit and another envelope for the surgical unit. Depending on unit census, 10 to 20 charts and patient rooms per unit were randomly selected for auditing twice a week at the two, four, six and eight week intervals. Confidentiality of both nurses and patients was maintained, as any patient or nurse identifiable information was not recorded and room numbers were not kept.

Chart audits evaluated compliance with the fall assessment and were only conducted on patients who had been admitted longer than 24 hours. Any chart that was randomly selected on a patient that did not meet this criterion was excluded. The hospital's fall-risk assessment policy required the nurse to initiate the fall-risk assessment on admission, and complete the assessment and care plan within 24-hours of admission. The chart audit also checked for identified patient fall-risk category, fall-risk score, active fall care plan, and at least two targeted interventions selected to be implemented per fall-risk from the defaulted list that the EMR provided.

The observation audit component of the FMAT tool listed all of the six fall-risk categories, and the list of possible selections for the targeted interventions that were defaulted into the Paragon EMR. Observation audits were rated as compliant if the

researcher could verify that a minimum of two selected targeted interventions had been implemented. Verification was either by observation or by verbal response from the patient.

Fall Rate Calculation

In Phase 3, effectiveness of the intervention was measured by comparing the historical fall rate to the fall rate at one-month and two-month periods after the implementation of the fall-risk program. The fall rate data was collected by the Fall Committee and provided to the researcher. Fall rate data included the entire hospital, which consisted of the surgical department, the medical department, the intensive care unit, the outpatient surgical department, the operating room, the recovery room, the emergency department, the pediatric department and the maternity and obstetrics department. The researcher used the measure defined by The Joint Commission to track fall rate by calculating the number of patient falls divided by the number of patient days multiplied by 1,000 (The Joint Commission, 2014). The Joint Commission refers to "bed days of care" as the total number of patient days to indicate the number of days that patients were occupying beds (The Joint Commission, 2014). For example, if the surgical unit has a census of 30 for 30-days, this is equivalent to 900 as the number of patient days. If this same unit had four falls in the last 30-days, the fall rate would be 4 divided by 900 x 1,000 = 4.44 falls per 1,000 patient days. The fall rate includes the actual number of patient falls, not the number of patients who experienced a fall, making the results more reflective of actual physical falls.

Data Collection

This study was approved by the Georgia College and State University Institutional Review Board and the community hospitals' Chief Nursing Officer. This translational project implemented best practices for reducing the rate of patient falls by using a valid and reliable fall-risk assessment tool with targeted interventions on the medical and surgical units of the community hospital. For this study, data was collected in 2 phases.

In Phase 2, demographic data information was collected after informed consent from a convenience sample of medical and surgical nurses. The pre- and post-test collected data that measured the effect of the educational intervention on nurses' knowledge. In phase 3, the Falls Measure Audit Tool was used to collect data from random chart and patient room observations to determine compliance to the fall-risk program. No identifiable information was collected on nurse participants or patients. The Fall Committee collected data on the overall fall rate for the hospital.

Data Analysis

Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 21.0. Demographic data collected from the participants in Phase 2 were analyzed to create percentages (see Table 1). The mean and standard deviation of scores were calculated for the participants' ages and years of nursing experience. Descriptive data from the demographic information on participants were gender, level of education, and assigned work unit. Any missing data during data analysis was disqualified and excluded from the study.

Paired-samples t-tests were used to assess differences between the pre- and post-test participant scores. The significance level of results was set at $\alpha \leq 0.05$. The differences between the mean scores were ranked to identify differences between the mean scores. The lower the mean difference, the higher the statistical significance of an increase in knowledge the participants received after the education session. The paired t-test was conducted to test whether the differences were significant between the pre-intervention fall rate and the post-intervention fall rate. According to the calculation and evaluation of the paired t-test, the higher the t-score the findings were in validating if the education sessions were effective in increasing participant knowledge.

Raw data was collected from the FMAT. Data from the EMR and patient room observation audits were analyzed using percentages. Percentages were used to identify trends in the data. Paired-samples t-tests were also used to assess differences between the pre- and post-fall rates to determine if a difference existed between the fall rates before the intervention to the post-intervention. The significance level of results was set at $\alpha \leq 0.05$. According to the calculation and evaluation of the paired t-test, the higher the t-score the more significant the findings were in validating if the implementation of the Morse Fall Scale paired with targeted fall prevention interventions result in a decreased rate of falls.

Congruence of Organization's Strategic Plan to Project

The mission of the hospital is to provide quality care and keep patients safe from hospital-acquired illness or injury. An essential component of quality care is preventing injury. The Joint Commission views fall management as a quality measure, and recommended that the hospital develop a Fall Prevention Program that utilizes a fall-risk

assessment to identify patient fall-risk resulting in a decrease in the rate of falls and fall-related injuries (The Joint Commission, 2013). The hospital's Chief Nursing Officer signed a statement of mutual agreement (see Appendix B). The Georgia College Institutional Review Board approved this study. Throughout the study, both researcher and organization ensured the project was congruent with the organizational values supporting patient safety and confidentiality.

In Phase 1 of the study, the hospital agreed to adopt the proposed fall prevention program. This included incorporating the Morse Fall Scale with targeted interventions to default in the Paragon computer system. Phase 2 of the study was an implementation phase. No personal information was obtained from the nurses or patient charts, the researcher signed a confidentiality statement that no patient information would be disseminated. In Phase 3, only observations of compliance were measured by the researcher looking at what fall prevention interventions were identified in the patient's care plan, and the researcher observed the patient's rooms to see if those same interventions identified in the care plan were being implemented. Patient charts and rooms were randomly selected by random drawings. During this phase, only fall rate data was retrospectively collected, and no collection of personal identifiable data was obtained or utilized.

Project Objectives

The objectives of this study were to:

1. Develop and implement a fall prevention program based on the best available evidence.

2. Evaluate the effectiveness of the educational sessions on nurses' knowledge of fall prevention techniques before and after the fall prevention education sessions.
3. Assess data on the hospital's fall rates before and after the implementation of the fall prevention program to evaluate the effectiveness of the program on decreasing patient falls.

Clinical Questions

The clinical research questions for this study are:

1. Does the implementation of an educational intervention improve nurses' knowledge of the fall prevention program?
2. What is the compliance rate with the fall-risk program at 2, 4, 6, and 8-weeks after the implementation of the program?
3. Does the implementation of the Morse Fall Scale paired with targeted fall prevention interventions result in a decreased rate of falls?

Results

Phase 2

Participant Characteristics. In Phase 2, among the 66 medical and surgical nurses employed by the community hospital, 31 gave their informed consent to be included in the analysis of level of knowledge for the pre- and post-tests; they also volunteered to provide the researcher with demographic data. Medical and surgical nurses that did not sign the informed consent were excluded from the study. The educational interventions and participant data collection period took place in June 2014.

Demographic Data. Although all 66 nurses were cross-trained at the community hospital to work the medical and surgical units, of the 31 nurse participants, 58%

identified themselves as surgical nurses and 42% as medical nurses. Descriptive data statistics for age, years of nursing experience, and nurses' education level are summarized in Table 1. The demographic data provided a description of this study's population.

Pre-test and Post-test Scores. Results from the pre-test and post-test scores answer the first clinical question, "Does the implementation of the educational intervention improve nurses knowledge of the fall prevention program?" Means (with standard deviations in parenthesis) for pre-test and post-test were 72.58 (13.65), and 98.38 (4.54) respectively. The paired t-test results show the main effect of the intervention on knowledge level as statistically significant (see Table 2), $t = 9.72$, $M = 25.8$, SD 14.78, df 39, and $p < .0001$. The one-degree-of-freedom contrast of post-test primary interest (the mean difference between the pre-test and post-test) was also statistically significant at the specified $\alpha=0.05$ level.

In reviewing the pre-test, scores were lower for knowledge on targeted interventions but were higher on how to complete the Morse Fall Scale. In reviewing the post-test scores, participant scores on targeted interventions had increased from the pre-test scores. Meanwhile, scores remained the same on how to complete the Morse Fall Scale. Nurses scored an average of 90 or higher on the post-test. There were no significant correlation noted in test scores among the nurse participants and their demographic data.

Phase 3

Fall Prevention Program Compliance. The Fall Measures Audit Tool (FMAT) results address the second clinical question, "What is the compliance rate with the fall-

risk program at two, four, six, and eight-weeks after the implementation of the program?" After review of 132 randomly selected charts and patient rooms over the eight-week period, percentages were used to identify trends in compliance (See Table 3).

At two-weeks, results from 23 audits data collected with the Fall Measures Audit Tool revealed at two-weeks that there were conducted on the medical and surgical units. There were 73.9% of all patients who were admitted more than 24-hours that had a fall-risk assessment completed on the EMR, and 26.09% did not. There were 86.96% of patients that were found to be at-risk for falls that had targeted fall prevention interventions implemented, and 13.04% that were not. At four-weeks, 39 audits found that 89.74% of all patients admitted more than 24 hours had a fall-risk assessment completed on the EMR, and 10.26% did not. There were 94.87% of patients found to be at-risk for falls who had targeted fall prevention interventions implemented and 5.13% did not. At six-weeks, 32 audits indicated 90.90% of all patients admitted more than 24 hours had a fall-risk assessment completed on the EMR and 9.09% did not. At six-weeks, 32 audits revealed 100% of patients found to be at-risk for falls who had targeted fall prevention interventions implemented. At eight-weeks, 38 audits revealed 100% of all patients admitted more than 24 hours had fall-risk assessments completed on the EMR and targeted fall prevention interventions implemented.

Overall, there were 88.63% of patients who had a fall-risk assessment completed on the EMR and 11.36% did not. There were 95.46% of patients that were found to be at-risk for falls that had targeted fall prevention interventions implemented, and 4.54% that were not. All of the 4.54% of fall-risk patients that did not have two or more targeted fall prevention interventions observed were those patients that had an intravenous (I.V.)

therapy fall-risk.

Fall Rate. Comparison of the historical fall rate to the post-implementation fall rate answers the clinical question, "Does the implementation of the Morse Fall Scale paired with targeted fall-prevention interventions result in a decreased rate of fall?" The average fall rate for the previous year (May 2013 - June 2014) prior to education sessions on using the Morse Fall Scale with targeted interventions averaged to be 1.4 per 1,000 patient days. The average fall rate for the period of July 2014 - August 2014 was 0.00 per 1,000 patient days.

Means (with standard deviations in parenthesis) for pre-fall and post-fall were 2.21 (1.18), and 0.00 (0.00) respectively. The paired t-test shows the main effect of the intervention on the fall rate as statistically significant (see Table 4), $t = 6.97$, $M = 2.21$, and $p < .0001$. Statistically significant $\alpha \leq 0.05$ level. The average fall rate on the medical and surgical floor in July 2013 was 0.48, and in August 2013 was 2.95.The average fall rate during July 2014 and August 2014 after the implementation of this project, was 0.00 per 1,000 patient stay days.

Discussion

Falls are a threat to the safety of patients in the acute care setting. The impact of the Morse Fall Scale on identifying patients prone to falls has been well-documented (Baek et al., 2013; Morse et al., 1989; Salarvand et al., 2010; Sung et al., 2013). Literature revealed the importance of targeting interventions with fall-risk assessments in order to reduce patient fall-risks (Dykes, 2012; Ganz et al., 2013; Goodwin et al., 2014; Graham, 2012; Pey et al., 2014). The need for this change project was identified by the community hospitals' need for a new fall-risk program to decrease their fall rate.

The use of the Roger's Diffusion of Innovation Theory was useful as a guideline for implementing this change project. During the knowledge phase, education sessions were conducted on the fall-risk assessment program, including the Morse Fall-risk Assessment tool and the targeted interventions. The nursing staff gained understanding of how the scale functioned paired with the targeted fall prevention interventions as evidence by the comparison of the pre- and post-test scores. During the persuasion stage, evidence-of the nurses' attitudes about the new program was relevant in the compliance with the new program. Rogers indicated that variables in the nurses' personalities and experiences can impact this stage (Rogers, 1995).

During the decision stage the hospital was on a time constraint with the expectation of a return visit from The Joint Commission; therefore, the nurses' support for the program was essential to its success. During the implementation stage, nurses put into practice the new fall prevention program, compliance with the fall-risk program was observed and documented by the researcher at two, four, six and eight-weeks after the education classes using the FMAT. An increase in fall incidence rates could have resulted in a decision to initiate more education sessions, or to re-design the fall prevention program.

However in this study, an increase in pre- and post-test scores showed significant increase in nurse's knowledge of the fall-risk program after the educational intervention. This increase in knowledge may have contributed to this study's high rate of compliance in the identification of fall-risks with targeted interventions in the EMR and the observed implementation of targeted interventions selected in the EMR. Overall 88.63% of patients had a fall-risk assessment completed within 24-hours of admission in the EMR. Given the

negative patient safety consequences, it is unclear why 11.36% did not. It is uncertain whether a relationship exists between the pre- and post-test scores and non-compliance rates, or if any of the demographic variables, such as education level or years of experience had an effect.

Once the fall assessment was entered into the EMR, a list of interventions appeared that were specific to the type of fall risk the patient exhibited. Nurses selected at least two risk-specific interventions from this list, ensuring an individualized fall prevention plan for the patient.

The use of the EMR to automatically provide the targeted intervention list supported the high compliance rate of 95.56% with completing the fall risk assessment and plan of care. It is undetermined if the type of targeted interventions provided in the EMR had an effect on the 4.54% non-compliance. The rate of compliance and non-compliance may be affected by the scoring system of the Falls Measure Audit Tool, which required a minimum of two targeted interventions selected in the EMR and two interventions observed being implemented for each identified fall-risk.

Interestingly, the 4.54% of charts that were not compliant with the fall risk interventions consisted entirely of patients with I.V. therapy as their only identified fall risk. Patients with I.V. therapy as the only identified fall-risk resulted in a low fall-risk score; however, nurses did not follow the fall prevention program procedure for implementing two or more of the selected interventions for I.V. therapy. It is unclear why non-compliance occurred with IV therapy patients. A review of the instructional class content confirmed inclusion of this risk factor.

No data was collected to compare non-compliance with nurses' perceived barriers to implementing the fall-risk program, or issues related to implementing I.V. therapy fall prevention targeted interventions. As the fall-risk program progressed over the eight-week period, compliance rate improved each period. By the eighth week of implementing the program, compliance rates were at 100%. The non-compliance rates may be related to the nurses being novices in implementing the program, or it may be that behaviors improved due to the observed auditing by the nurses of the researcher for program compliance.

Methodological Assumptions

It was a methodological assumption that nurses understood the directions for the education sessions based on the pre- and post-test scores, and data was accurately calculated and entered into the SPSS program. Although the audit tool lacked established validity and reliability, it was assumed that the tool would measure compliance accurately.

Overall, when comparing the historic fall rate that was averaged over a 12-month period with the post-implementation fall rate at the time of the study, a significant decrease in fall rate occurred. The researcher included the historical fall rate of the medical and surgical units from the previous year with the post-implementation fall rate at the time of the study to support the statistical significance of the effect of the fall-risk program on decreasing the fall rate. With the costs of inpatient falls averaging $17,500 per fall, this program may have saved the community hospital over $100,000 by decreasing the rate of falls from an average of 3 falls per month or 1.4 per 1,000 patient days to 0.00 per 1,000 patient days. More information is needed to determine if a

difference in patients' secondary diagnoses, age, gender, or environmental conditions in this study's post intervention to post intervention period contributed to the fall rate results of this study.

Limitations

Despite the positive impact, there are some limitations in the generalizability of this project. Although the study adds to the growing body of knowledge on the use of fall-risk assessments with targeted interventions in the management of fall-risk patient populations, the sample sizes employed by this study in Phase 2 were small. The project was implemented in one small community hospital over a short period of eight-weeks, adding to the limitation of the study. While this project's results revealed positive outcomes, the possibility that medical and surgical nurses' compliance was monitored at two, four, six and eight-week intervals may have affected the outcomes.

Implications for Nursing

Nursing implications for future projects that test various fall-risk assessment tools with targeted interventions are needed to test effectiveness of using targeted interventions with other valid fall-risk assessments on fall rates. If targeting fall prevention interventions are found to be effective with other valid fall-risk assessment tools, alternate assessment tools could be used in a variety of settings. Since this project was conducted in a small community hospital, testing the effectiveness of this project in various health care and community settings would support its use in diverse settings.

Implications for Healthcare

In a fee-for service healthcare system, reducing the rate of falls and injuries related to falls reduces the impact on the cost of falls on healthcare. A decrease in fall rate

was the result of this transformational project. If using a valid fall-risk assessment tool with targeted interventions reduces fall rates implications for healthcare may result in lower costs of medical, labor and medical mal-practice costs.

Recommendations

Additional research is needed using the Morse Fall Scale with targeted interventions over an extended period. This projects' fall-prevention program was implemented in a community hospital setting. Researching the effectiveness of this projects' fall prevention program in a larger acute care setting may add to the reliability of this projects' results. Further research is needed to evaluate the cost effectiveness of the type of intervention implemented in this study.

Conclusion

Overall, use of a valid fall-risk assessment tool with targeted interventions was effective in reducing falls. The fall prevention program was developed to meet the Joint Commission's National Patient Safety Goal 9, in using a valid fall-risk assessment to decrease the fall rate and injuries related to falls. A follow-up visit by The Joint Commission after the implementation of this program resulted in approval of the fall risk program with no recommendations for improvement of the hospital's fall prevention program. The Joint Commission Center for Transforming Healthcare Preventing Falls with Injury recognizes and supports the use of targeted interventions with a valid fall-risk assessment to decrease fall rates through their new fall-risk project scheduled for release in 2015 (The Joint Commission, 2014).

To provide ongoing evaluation of the effectiveness of this project, the researcher recommends re-evaluation of the program at the community hospital after a 12-month

period. Researching and implementing best fall prevention practices contributed to the researcher's personal goals of becoming a change agent for best practice implementation.

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Appendix A

The Morse Fall Scale

Item	Item Score	Patient Score
1. History of falling (immediate or previous)	No 0 Yes 25	_____
2. Secondary diagnosis (≥ 2 medical diagnoses in chart)	No 0 Yes 15	_____
3. Ambulatory aid None/bedrest/nurse assist Crutches/cane/walker Furniture	 0 15 30	_____
4. Intravenous therapy/heparin lock	No 0 Yes 20	_____
5. Gait Normal/bedrest/wheelchair Weak* Impaired†	 0 10 20	_____
6. Mental status Oriented to own ability Overestimates/forgets limitations	 0 15	_____
Total Score‡: Tally the patient score and record. <25: Low risk 25-45: Moderate risk >45: High risk		_____

Appendix B

Memorandum of Understanding

April 23, 2014

To Whom it May Concern,

Angela Jacobs, a DNP student at Georgia College and State University, has the approval of Coffee Regional Medical Center to implement her translational and clinical project between May and July 2014. The project, "Implementation of Best Practices for Fall Prevention in a Community Hospital" will support our efforts to decrease the fall rate of patients on our medical/surgical nursing units. We understand the project will include the following:

1. A teaching intervention on the new fall prevention program using the Morse Fall Scale with targeted fall prevention interventions, including a pre- and post-test for those nurses who volunteer for the study and sign the consent form.
2. Random chart reviews and unit observation to measure compliance with the new fall prevention program over an 8-week period. To prevent HIPPA violations, no patient or nurse participant identifiable data will be collected.
3. Comparing fall rates over the past 12 months with fall rates 8 weeks after the education session intervention to measure the effect of the intervention on fall rate.

Sincerely,

Sherry Thomas

Sherry Thomas RN
CRMC VP of Patient Care Services

Appendix C

Number _____

Informed Consent

Research Topic: Implementation of Best Practices for Fall Prevention in a Community Hospital

Principal Investigator:

Angela Jenkins-Jacobs MSN, R.N.
Georgia College and State University, DNP Candidate
706-202-9754
angela.jacobs@bobcats.gcsu.edu

I, _____, agree to participate in the research *Implementation of Best Practices for Fall Prevention in a Community Hospital*, which is being conducted by Angela Jenkins-Jacobs, who can be reached at 706-202-9754. I understand that my participation is voluntary; I can withdraw my consent at any time. If I withdraw my consent, my data will not be used as part of the study and will be destroyed.

The following points have been explained to me:

1. The purpose of this study is to improve the recognition and treatment of patients at risk for falls using the Morse Fall Scale with targeted fall prevention interventions.
2. The procedures are as follows: you will be asked to:

    a) Take a pre-test
    b) Attend a fall prevention education class on using the Morse Fall Scale with targeted interventions
    c) Take a post-test

3. For this project, the researcher will :

    a) Administer a pre and post-test with questions on using targeted fall prevention interventions on fall risks identified on the Morse Fall Scale.
    b) Assess the community hospital (research facility) fall risk score pre (for last 12 months) and post fall prevention education class (8 weeks after teaching how to use targeted interventions on fall risks that are identified using the Morse Fall Scale). These results will not be linked to your name or participant number.
    c) Complete chart audits and observations from randomly selected room numbers (5-10 room numbers to be randomly drawn out of a jar daily, four time periods at 2, 4, 6 and 8 weeks) to assess if fall risk procedures are followed. These results will not be linked to your name or participant number.

4. You will not list your name on the pre or post- test data sheets. Therefore, the information gathered will be confidential.
5. You will be asked to sign two identical consent forms. You must return one form to the investigator before the study begins, and you may keep the other consent form for your records.
6. You may find that some questions are invasive and personal. If you become uncomfortable answering any questions, you may cease participation at that time.
7. You are not likely to experience physical, psychological, social, or legal risks beyond those ordinarily experienced in daily life or during the performance of routine examinations or tests by participating in this study.
8. Your individual responses and documentation will be confidential and will not be released in any identifiable form without your prior consent, unless required by law.
9. The investigator will answer any further questions about the research (see above telephone number).
10. In addition to the above, further information, including a full explanation of the purpose of this research, will be provided at the completion of the research project on request.

Signature of Investigator Date

Signature of Participant Date

Research at Georgia College & State University involving human participants is carried out under the oversight of the Institutional Review Board. Address questions or problems regarding these activities to Mr. Marc Cardinalli, Director of Legal Affairs, CBX 041, GCSU, (478) 445-2037

Appendix D

Fall Measures Audit Tool

Date_____

Medical Record Audit for Morse Fall Scale Documentation

1. Was risk assessment completed within 24 hours of admission? Yes or No
2. Is the patient at risk for falls? Yes or No (If no, do not answer questions 3-6)
   If yes, what was the fall-risk score? _____
3. What was category of fall-risk, if patient is at risk for falls?
   - o History of falling
   - o Secondary Diagnosis
     (1 or more medical diagnoses documented in medical record?
   - o Ambulatory Aid
   - o Intravenous Therapy/ heparin (saline) lock
   - o Gait
   - o Mental Status
5. Does patient have an active fall prevention care plan? Yes or No
6. What interventions were selected to target the fall-risks?

Please check yes or no for the fall-risk identified on the Morse Fall Scale, targeted interventions selected in patient's care plan.

History of Falling

Yes	No	
☐	☐	Verbally inform patient and family of fall prevention interventions.
☐	☐	Shift Report communicate the patient's "at risk" status.
☐	☐	Collaborate with multi-disciplinary team members in planning care.
☐	☐	

Secondary Diagnosis (> 1 medical diagnoses in chart)

☐	☐	Orient patient to surroundings and hospital routines
☐	☐	Location of the bathroom pointed out to patient
☐	☐	Patient instructed to call for help before getting out of bed.

Ambulatory Aid

☐	☐	Place ambulatory aid within reach of the patient
☐	☐	Discuss ambulatory aid needs with patient
☐	☐	Provide a commode at bedside (if appropriate).
☐	☐	Urinal/bedpan should be within easy reach (if appropriate).
☐	☐	Remove unnecessary equipment and furniture
☐	☐	Ensure pathway to the bathroom is free of obstacles and is lighted.
☐	☐	Consider placing patient in the bed that is close to the bathroom.

☐ ☐ Physical Therapy consulting with patient.

Intravenous Therapy / Heparin (Saline) Lock

☐ ☐ Evaluate IV medications for potential side effects and discuss with patient, pharmacist, or physician
☐ ☐ Discuss peak effect that affects level of consciousness, gait, and elimination when planning patient's care with members of health team
☐ ☐ Patient on a bowel and/or bladder program
☐ ☐ Provide a commode at bedside (if appropriate).
☐ ☐ Urinal/bedpan should be within easy reach (if appropriate).
☐ ☐ Make "comfort" rounds every hour, toileting, and uncluttering room including IV equipment out of the pathway of the bathroom and I.V. pole positioned on side of bed closest to the bathroom ensures that patient is warm and dry).

Gait

☐ ☐ Bed in low position with brakes locked, document number of side rails.
☐ ☐ Personal belongings within reach.
☐ ☐ Remove unnecessary equipment and furniture
☐ ☐ Ensure pathway to the bathroom is free of obstacles and is lighted.
☐ ☐ Consider placing patient in the bed that is close to the bathroom.
☐ ☐ Use a night light as appropriate.
☐ ☐ Physical Therapy consulting with patient
☐ ☐ Assist when out of bed

Mental Status

☐ ☐ Bed in low position with brakes locked, document number of side rails.
☐ ☐ Patients left unattended in diagnostic or treatment areas.
☐ ☐ Patient placed in a room near the nursing station, for close observation, especially for the first 24–48 hours of admission.
☐ ☐ Patient has a safety alarm (bed alarm &/or pressure sensor alarm).
☐ ☐ Communicate the frequency of alarms each shift.
☐ ☐ If appropriate, consider using protection devices: hip protectors, a bedside mat, a "low bed" or a helmet.
☐ ☐ Make "comfort" rounds every hour and include change in position, toileting, offer fluids and ensure that patient is warm and dry.
☐ ☐ Talk with family regarding a sitter

Direct Observation for Targeted Interventions for Fall-risks Identified Using the Morse Fall Scale

(2 or more observed interventions=compliance)

History of Falling

Yes	No	
☐	☐	Verbally inform patient and family of fall prevention interventions.

☐ ☐ Shift Report communicate the patient's "at risk" status.
☐ ☐ Collaborate with multi-disciplinary team members in planning care.
☐ ☐

Secondary Diagnosis (> 1 medical diagnoses in chart)

☐ ☐ Orient patient to surroundings and hospital routines
☐ ☐ Location of the bathroom pointed out to patient
☐ ☐ Patient instructed to call for help before getting out of bed.

Ambulatory Aid

☐ ☐ Place ambulatory aid within reach of the patient
☐ ☐ Discuss ambulatory aid needs with patient
☐ ☐ Provide a commode at bedside (if appropriate).
☐ ☐ Urinal/bedpan should be within easy reach (if appropriate).
☐ ☐ Remove unnecessary equipment and furniture
☐ ☐ Ensure pathway to the bathroom is free of obstacles and is lighted.
☐ ☐ Consider placing patient in the bed that is close to the bathroom.
☐ ☐ Physical Therapy consulting with patient.

Intravenous Therapy / Heparin (Saline) Lock

☐ ☐ Evaluate IV medications for potential side effects and discussed with patient, pharmacist, or physician
☐ ☐ Discussed peak effect that affects level of consciousness, gait, and elimination when planning patient's care with members of health
☐ ☐ Patient on a bowel and/or bladder program
☐ ☐ Provide a commode at bedside (if appropriate).
☐ ☐ Urinal/bedpan should be within easy reach (if appropriate).
☐ ☐ Make "comfort" rounds every hour, offering (toileting and unclutter room including IV equipment out of the pathway of the bathroom and I.V. pole positioned on side of bed closest to the bathroom, ensure that patient is warm and dry).

Gait

☐ ☐ Bed in low position with brakes locked, document number of side rails.
☐ ☐ Personal belongings within reach.
☐ ☐ Remove unnecessary equipment and furniture
☐ ☐ Ensure pathway to the bathroom is free of obstacles and is lighted.
☐ ☐ Consider placing patient in the bed that is close to the bathroom.
☐ ☐ Use a night light as appropriate.
☐ ☐ Physical Therapy consulting with patient
☐ ☐ Assist when out of bed

Mental Status

☐	☐	Bed in low position with brakes locked, document number of side rails.
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☐	☐	Patient has a safety alarm (bed alarm &/or pressure sensor alarm).
☐	☐	Communicate the frequency of alarms each shift.
☐	☐	If appropriate, consider using protection devices: hip protectors, a bedside mat, a "low bed" or a helmet.
☐	☐	Make "comfort" rounds every hour and include change in position, toileting, offer fluids and ensure that patient is warm and dry.
☐	☐	Talk with family regarding a sitter

Table 1

Demographic Characteristics of Participants in Phase 2

Variable[a]	*M*	*Mdn*	*SD*	*Percentages*
Age in years				
(Age ranges 25-71)	46	48	12.5	
Years of Experience				
(Ranges 0-42)	16	20	12.4	
Gender				
Male		1		3%
Female		30		97%
Education Level				
LPN		4		12%
ASN		16		52%
BSN		8		26%
MSN		3		10%
Acute Care Nurse Participants				
Unit		18		58%
Surgical		3		42%
Medical				

Note: [a]*n*=31

Table 2

Paired t-test Results of Pre-test and Post-test

Group	N	Mean	Mean Differences	t	df	Sig. (2-tailed)
Pre-test	31	72.58				
Post-test	31	98.38	25.806	9.721	30	.000

Note. The significance level was set at $\alpha \leq 0.05$.

Table 3

Chart and Patient Room Audit Compliance Rates

		Compliance Category	
Parameter	n	Fall-risk Completed in Chart	Targeted Intervention Implemented
2 weeks	23	73.91%	86.96%
4 weeks	39	89.74%	94.87%
6 weeks	32	90.90%	100%
8 weeks	38	100%	100%

Note. n= number of audits completed. Percentages retrieved from data collected from the Fall Measures Audit Tool developed by the researcher.

Table 4

Paire t-test Results of Pre- and Post-intervention Fall Rate

	N	Mean	t	df	Std	Sig. (2-tailed)	Fall Rate per 1,000 patient days
Pre-intervention	14	2.21	2.558	14	1.18	.023	1.4
Post-intervention	0	0	6.972	13	.000	.000	0.0

Note. Statistically significant $\alpha \leq 0.05$ level. Pre-intervention fall rate averagred over a 12 month period. Post-intervention fall rate averaged over a two month period.