**Preventing Falls in an Acute Care Setting Through
Patient and Family Education**

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*"On my honor as a student, I have neither given nor received unauthorized aid on
this assignment"*

Abstract

Patient falls are of particular interest to hospitals as they are the leading cause of adverse events in this setting and the Center for Medicare and Medicaid no longer reimburses hospitals for care related to serious injury from a patient fall. Evidence based protocols and the literature support multifaceted fall prevention interventions, one of which is falls prevention education to patients and their families. A gap was found in the availability of evidence based falls prevention education.

The study sought to determine if falls and falls with injury rates are decreased in older adults when patients and family support are provided an educational video on falls prevention based on the theory of planned behavior and social support theory. A 36 bed medical unit in a 238 bed community hospital provided a sample of convenience for this quasi-experimental two group design study with a comparison group ($N = 100$) receiving usual care and education brochure and intervention group ($N = 92$) receiving usual care, education brochure, and video with teach-back.

The study was unable to reinforce social support due to the small numbers of family viewing the video ($N = 7$). No statistical difference between groups was found based on rates of falls per 1000 patient days, $\chi2(1, N = 192) = 1.86$, $p = .270$ due to the small number of falls. However, a statistically significant difference was demonstrated between groups in the proportion of patients receiving any falls education intervention based on the study phase, $\chi2(1, N = 192) = 0.20$, $p < .001$ and exceeded Cohen's (1992) convention for medium effect size. This statistical difference between groups for fidelity of education intervention supports clinically significant findings when comparing the frequency of fall rates between groups (Phase 1 = 6.01 vs. Phase 2 = 0.0). Interestingly,

70% of intervention participants viewed a falls education video and 94% of these participants received follow up by way of teach-back by the Registered Nurse. The results of this study provide clinically significant support for previous study's findings for the use of multimedia education and teach-back.

Keywords: falls, education, hospital, acute care, older, education, and planned behavior.

Table of Contents

Section I: Introduction and Purpose

Introduction

Falling is a serious public health problem which can reduce quality of life and cause death. According to a report from the Center for Disease Control and Prevention (CDCP) falls in older adults, 65 years of age and older, are the leading cause of injury death and the most common cause of hospital admissions for trauma (CDCP, 2005). Further, traumatic brain injury accounted for 46% of fall injury deaths in 2000 and predicts that without intervention, there will be 500,000 hip fractures per year related to falls by 2040. In addition, hip fractures may cause significant functional impairment, require nursing home placement, and one in five hip fractures result in death (CDCP, 2005).

The United States Department of Health and Human Services has promoted interest in falls prevention in the Healthy People campaigns. "Healthy People 2010" and "Healthy People 2020" include objectives to address the public health issue of falls. "Healthy People 2010" sought to prevent unintentional injuries with objectives to reduce deaths from falls and prevent hip fractures (U. S. Department, 2000). "Healthy People 2020" includes objectives to prevent an increase in falls related deaths in persons of all ages and adults age 65 and older (U.S. Department, 2010). In addition, reducing emergency department visits related to falls is also an objective for older adults (U.S. Department, 2010).

Falls are reported to be the most frequently occurring adverse event for adult patients in hospitals (Currie, 2008). While patients of all ages fall when hospitalized,

several researchers have found a correlation between falls and increased age (Currie, 2008; Hitcho et al., 2004; Krauss et al., 2007). Between 26% and 42% of hospital falls result in patient injury and between 2.4% and 8% of hospital falls result in serious injury (Krauss et al., 2007; Hitcho et al., 2004).

In 2008 the Center for Medicare and Medicaid Services (CMS) determined that falls with trauma were an identified hospital acquired condition, defined as easily prevented when evidenced based guidelines are used (CMS, 2011). Treatments related to hospital acquired conditions, and therefore injuries due to falls in acute care, are no longer reimbursed by CMS. The costs to hospitals can be significant as researchers have shown increased lengths of hospital stay after a fall to cause an additional 6.3 to 12 days, and an increased mean cost up to $13,316 as a result of serious falls (Bates, Pruess, Souney, & Platt, 1995; Wong et al., 2011).

Falls in the hospital setting are of concern to nursing and are endorsed by the National Quality Forum as a nurse sensitive indicator for acute care hospitals (National Quality Forum, 2009). The Magnet Nursing Designation awarded by the American Nurse Credentialing Center (2012) has become a coveted credential by many healthcare organizations around the world and is considered an indication of high quality nursing practice. Standards of Magnet require that hospital personnel monitor certain nurse sensitive outcome indicators and compare the hospital's performance for these outcomes to national benchmarks; the expectation is that Magnet hospitals sustain results to outperform the mean (ANCC, 2008). Therefore interventions to prevent patient falls are needed.

An evidence based falls prevention protocol is available from the Agency for Health Care Quality. This protocol was developed by members of the Institute for Clinical Systems Improvement (ICSI), a non-profit organization of sixty two medical groups sponsored by five Minnesota and Wisconsin health plans. The protocol is titled "Prevention of falls (acute care). Health care protocol" (ICSI, 2010; Degelau, et.al, 2012). The protocol includes providing education to patient and family on fall prevention but does not provide evidence for the most effective education content or delivery method for the intervention. The Joint Commission (2011) and the Agency for Healthcare Research and Quality (2011) have both launched campaigns to encourage patients to speak up for their own safety and to have family or a significant other present when managing health care issues. However no specific direction for the family member's role in fall prevention is provided.

A gap exists in the availability of evidence based messages and content for acute care education on fall prevention for patients and their families. Existing videos and brochures related to fall prevention are primarily targeted to the older adult in the community and do not include messages for family and significant others (TJC, 2011; U. S. Department, 2000; U. S. Department, 2010). Although one falls prevention video for purchase was found online, it did not include specific messages related to the family's role in the prevention of patient falls (Envision, 2012).

Evidence based protocols and the literature support multifaceted fall prevention interventions, one of which is falls prevention education to patients and their families (ICSI, 2010; Hill et al., 2009; Haines et al., 2011; Dykes et al., 2009). There is some

evidence that a multimedia educational delivery method with one to one follow up by a health counselor improves knowledge and outcomes for the older adult (Haines, et al., 2011; Hill et al., 2009). The purpose of this study was to develop an evidence based education video on falls prevention for the hospitalized older patient, to include this education to a family member or support person, perform teach-back with the patient, and to compare the difference in fall rates between patients and families in an intervention group who received a fall prevention brochure and viewed an investigator developed video and patients in a comparison group who only received a falls prevention brochure.

Theoretical Framework

Individual health behavior theories can provide a structure for designing a program to promote health and prevent health problems (Edberg, 2007). Only two studies were found comparing educational methods for the hospitalized patient, both designed on the health belief model; however neither study discussed specific messages for the patient or for the family's role in fall prevention (Haines, et al., 2011; Hill et al., 2009).

In developing a program of education for older adults and their family member in the acute care setting, the theory of planned behavior, an individual health behavior theory may be beneficial, particularly when aligned with social support theory. VonDras & Madey (2004) studied 290 survey respondents to explore the theory of planned behavior and social support influences on health goal attainment. Participants developed their own health goals and proceeded to complete survey tools to measure the relationships of all aspects of the theory of planned behavior and social support as a

predictor of successful attainment of their goals. All aspects of the theory of planned

behavior were found to correlate with intention. The study also found a strong

correlation to suggest that the emotional and instrumental social support by family or

friends provides influence on behavioral intent around health goal attainment and may

overcome motivators to follow perceived subjective norms.

The theory of planned behavior predicts deliberate behavior and has been used

extensively in the healthcare field (Edberg, 2007). Ajzen (1991) provides a

comprehensive review of the theory of planned behavior which is reviewed here.

Importantly, the theory of planned behavior describes intention as the combined result of

three elements: the individual's attitudes, subjective norms, and perceived behavioral

control. An individual's attitude to behavior is, to some degree, valued either positively

or negatively and is determined by behavioral beliefs and the subjective likelihood that

the behavior will produce a given result. Subjective norm is the perceived social pressure

to perform or not perform the behavior and is determined by normative beliefs, where the

prominence of the norm and willingness to comply are of importance. Perceived

behavioral control consists of the individual's perception of his/her ability to perform the

behavior and is determined by control beliefs, which are factors that can facilitate or

hinder performance of the behavior. If these three elements are generally positive, the

individual will have the intention to perform the behavior but if the behavior is beyond

the individual's control the behavior does not occur and perceived behavioral control thus

has a direct impact on behavior.

While no studies were reported using the theory of planned behavior for studying patient's fall prevention behavior in the hospital setting, findings from studies reviewed closely align with the theory's three determinants which influence intention to perform a behavior; attitude toward the behavior, subjective norms, and perceived behavioral control (CDC, 2005; Currie, 2008; Hitcho et al., 2004; Tzeng, 2010; Krauss et al., 2007; Carroll et al., 2010; Bates et al., 1995; Tzeng, 2010; Kloseck, Crilly, & Gibson 2008; Yardley, Donovan-Hall, Francis, & Todd 2006; Carroll, Dykes, & Hurley, 2010; Tzeng & Yin, 2009).

Social support theory and the quality of one's social support has also been studied extensively in the health care field and found to be a powerful factor for individuals meeting health related goals (VonDras & Madey, 2004). Social support theory identifies how interpersonal relationships can influence the health behavior of others in both a positive or negative manner. Rook (1994) identified three forms of social support developed from studies of older adults which may have an impact on the older adult's health behaviors. These three forms of social support are categorized as emotional (provision of empathy and reassurance), instrumental (providing aid or services), and informational (providing advice and information). Rook (1994) also reviews the concept of social control which involves an important social member using persuasion and monitoring to encourage preventative health related behaviors and to not engage in risk taking health behaviors.

Although not directly measured, major concepts from the theory of planned behavior and social support theory provided the basis for the conceptual framework that

guided the study (see Appendix A). As depicted in the model, the patient enters the hospital with beliefs about the likely impact of behavior, normative expectations, and factors that help or hinder behavior that prevent falls as well as social support from family. After admission to the hospital, the patient and family view the video on fall prevention. This educational intervention is expected to influence the beliefs about the likely impact of the behavior, beliefs about normative expectations, and beliefs about the factors that help or hinder behavior as well as social support in an attempt to increase intention to follow the falls prevention protocol. It was anticipated that fall rates in those patients who have viewed the video with family would be lower than patients who have not viewed the video and received information about fall prevention through a brochure.

Purpose of the Study

A gap was found in the availability of evidence based falls prevention education for the hospitalized adult patient and no clearly identified role for the family when educated; however there is some evidence that a multimedia delivery of education may improve knowledge and outcomes. The data and literature on falls is predominately focused on the older adult and expertise from health promotion literature encourages a clear target population when designing messages to change health behaviors (Edberg, 2007; US Department, 2004; US Department, 2005).

Therefore the broad long term goal of this study was to reduce rates of fall and falls with injury in the older hospitalized adult. The specific aims were to:

- develop an evidence based video for the older hospitalized adult and family support person, based on the theory of planned behavior and social support theory

- increase the patient's knowledge of fall risk and behavioral intent to follow fall prevention strategies

- improve the family support person's knowledge of fall risks and their role in supporting the patient in behaviors that prevent falls in the hospital

Specifically the study attempted to answer this question:

Are falls and falls with injury rates decreased in older adults when patients and family support are provided an educational video on falls prevention based on the theory of planned behavior and social support theory?

Section II: Review of the Literature

Introduction

Identification of the gap in availability of evidence based falls prevention education lead to a review of the literature guided by the theory of planned behavior. The intent was to find some evidence to develop messages for patients and families to improve compliance with fall prevention strategies.

The literature review is organized to present evidence related to risk factors associated with falling for older hospitalized patients, evidence related to insights from patients and caregivers views' on fall prevention, and studies previously published on fall education prevention for older hospitalized patients. The literature review is then synthesized to craft educational messages for the patient and family within the framework

of the theory of planned behavior and social support theory (See Appendix B for the review of the literature table).

Factors Related to Risk of Falling When Hospitalized

Patients who require hospitalization are in varied states of dependency for care and at differing levels of self care ability. Patients of all ages have been found to fall while on an inpatient unit. However, in a study of 183 falls of older adults in one academic medical center, 85% occurred in the patient's room, 59% during the evening and nighttime, 19% during ambulation, and 50% related to toileting (Hitcho et al., 2004). Central nervous system medications were administered to 58% of those who had fallen and 56% received vasoactive medications within 24 hours of falling (Hitcho et al., 2004). Limitations of this study included the potential bias which may result from one researcher determining themes within narrative data of hospital incident reports and results are not necessarily generalizable beyond the study site.

In a retrospective cohort study, Krauss et al. (2007) examined 7,082 falls in nine Midwestern hospitals to identify circumstances for falls and injuries. Of the non academic hospitals included in the study, a higher incidence of injury from falling was associated with increased age, falls in the bathroom, and falls which occurred in unassisted patients. This study may offer some insight to risk factors as the use of multiple hospital sites, even though in the same hospital system, and sample size strengthened the ability to generalize these results.

Toileting needs has been reported in the literature as a risk for patient falls. In a qualitative retrospective study of 547 falls incidence reports from four units in a hospital

Tzeng (2010) found that 45% of falls were related to toileting and occurred when the

patient was on the way to the bathroom from the bed or chair or on the way back to bed

or chair from the bathroom. Because the consistency in data categorization of this

qualitative study was achieved through use of only one researcher review, bias might be

suspect. The need to toilet, with an associated loss of balance and unexpected weakness,

were causes reported by 9 patients who had fallen within 48 hours of being interviewed

(Carroll, Dykes, & Hurley, 2010). Participants in this study also verbalized that they

were reluctant to bother the busy nursing staff to assist them in toileting. These studies

provide some evidence of toileting while unassisted as a risk factor for older adult falls in

the hospital.

In a retrospective case-control study of 62 case control pairs, Bates et al. (1995)

found a significant correlation between confusion and multiple comorbidities with falls

injuries in one hospital setting. In a retrospective descriptive study of the influence of

mental status on 1017 patients who had fallen, Tzeng (2010) found a statistically

significant association between impaired mental status and severity of fall injury.

Findings of the study reported 34% of these falls were associated with impaired mental

status and statistical significance was found for impaired mental status for the more

severe falls injuries. This study was conducted in one hospital but did include six

different units within the hospital, allowing for the sample to represent differing patient

diagnostic populations.

Other factors that may present as risk factors for falling were reported in the

studies reviewed. Of 183 patient falls, Hitcho, et al. (2004) reported 29% of patients used

an assistive ambulation device at home but only 6% were using a device when the fall

occurred. In a qualitative study Tzeng & Yin (2009) interviewed 91 patients in a home

care setting after discharge from the hospital. Patients in this study reported availability

of ambulatory devices, clear pathways in the room, timely answering of call bells, and

bed height to be factors putting them at risk of falling.

These studies suggest multiple risk factors are related to falls in a hospital. There

is some evidence for patients being at risk while unassisted in their rooms and during

attempts to ambulate and toilet. Patients with impaired cognitive status and multiple

comorbidities may also be at higher risk of falling in the hospital. Patient engagement in

prevention may be hindered by attitudinal social norms related to not wanting to bother

the nurse for assistance. Environmental factors also play a role in the patients risk for

falling.

Insights from Patients and Caregivers on Fall Prevention

Two qualitative studies provide insight into patients' views of fall prevention

education and messages. Tzeng & Yin (2009) utilized a survey tool and visiting trained

health care providers to collect data from 91 home health patients discharged from

affiliated hospitals. Interviews were obtained within 30 days of discharge from a

hospital. Information was elicited on the patients' opinions and observations regarding

the fall prevention program received during their recent hospitalization. More than half

of the patients in this study did not believe the fall-prevention program they received

during hospitalization was adequate. Specifically they criticized beds being left in high

position, insufficient fall prevention education, lack of ambulatory devices, cluttered

rooms, need for increased monitoring, timely answering of call bells, and lack of physical therapy. They recommended a well designed education program with visual cues that engaged the patient and for nurses to offer more frequent repetition of fall prevention messages.

Patient focus groups provided the venue for a qualitative study by Yardley, Donovan-Hall, Francis, & Todd (2006). In this study conducted in the United Kingdom, community dwelling older adults ($N = 66$) were asked about their perceptions of fall prevention advice and suggestions for designing communications to encourage older adults to practice fall prevention strategies. While these older adults agreed to the value of falls education, they related that they may not heed all of the advice and that some of these older adults believed the messages were for the disabled and not for them. Some participants perceived the messages to be authoritarian and a threat to autonomy and dignity. There was a recommendation by the participants to create messages that relay positive suggestions. The researchers debated whether these findings may indicate a need for increasing messages on the reality of older adults' vulnerability to falling.

Nurses ($N = 23$) and nursing assistants ($N = 19$) were interviewed using a focus group design to elicit views as to why patients in acute care hospitals fall and how falls might be prevented (Dykes, Carroll, Hurley, Benoit, & Middleton, 2009). The researchers developed two categories, knowledge/communication and capability/actions which link facilitators and barriers retrieved from the interviews. The outcome data included the need to facilitate such areas as access to individual risk information for caregivers as well as patients and families, and strategies to overcome barriers such as

patients not following instructions. While the sample size was small the interviewees represented four hospitals with differing characteristics.

These qualitative studies provide some insight to how patients and caregivers view the problems with falls prevention programs and the messages to prevent falls. Some patients are not impressed that current message designs convey how they are personally susceptible to falling and may even be perceived negatively as a threat to dignity. Some congruence may exist as nurses see patient noncompliance with prevention strategies as a barrier to preventing falls and patients interviewed requested increased frequency of reminders from nurses about fall prevention.

Research on Patient and Family Fall Prevention Education

In a three group randomized control Australian study, Haines et al. (2011) found no significant differences in fall rates between patients in a control group who received no specific education, patients in a treatment group who received multimedia education and a one on one follow-up with a health professional, and patients in a treatment group who received only the multimedia education. However, findings in this study did result in a significant difference in fall rates between cognitively impaired patients and those who were cognitively intact. The cognitively intact patients in the treatment group who received multimedia education with a one on one follow-up by a health professional experienced fewer falls than the cognitively intact patients in the treatment group receiving only multimedia education. Participants in the two intervention groups received content and progressive education based on the health belief model.

This study provides some evidence for multimedia education with one to one follow up for cognitively intact patients as compared to a materials only group and control group. A power analysis was calculated and a total sample of 1206 patients allocated to control group ($N = 381$), materials only group ($N = 424$), and complete program group ($N = 401$) met the desired sample size. However, the setting of the study was two hospitals in Australia with sample subjects from both acute and subacute care units. The method allowed a week for one to one follow up by the health worker to review learning and set patient specific goals, possibly a reflection of the population which included a subacute level of care. The time spent individually with a patient for one to one follow up ranged from 20 to 36 minutes per patient. This method may not be feasible in hospitals with resource limitations and lengths of stay of less than one week.

In a randomized two group Australian study, with a quasi-experimental control group, Hill et al. (2009) compared the effect of falls prevention education delivered by DVD format or written format to no education, both of which were based on the individual health belief theory, the Health Belief Model. Following falls prevention education a custom designed survey measured patient's knowledge of risk of falls, perception of falls epidemiology, knowledge on prevention of falls, and confidence to follow falls prevention strategies. While both methods of education created higher numbers of desired responses to the survey compared to the control group, the DVD method of education delivery was found to produce statistically higher levels of confidence, motivation, and engagement in self-protective strategies than participants receiving education through written material.

In this Hill et al. (2009) study, comparison is provided between a control group of 122 patients receiving no specific falls education to a group of 49 patients who received education through a DVD, and a group of 51 patients who received education through written material. While the study provides some evidence for multimedia delivered education, limitations of the study include generalizability related to sample size and lack of power analysis.

In a cluster randomized study, Dykes et al. (2010) utilized an information technology fall prevention tool kit which included a patient/family education intervention, the Morse Fall Scale risk assessment, a communication poster of the patient's fall risk, and a tailored patient fall prevention plan to decrease patient falls on study units in four United States hospitals in urban areas. The control group of 5104 participants received usual care and the intervention group of 5160 participants received a fall prevention patient specific fall prevention plan based on data from the Morse Fall Scale score entered into a health information technology system. The health information technology system then gave the nurse specific outputs for the communication poster over the patient's bed, a tailored plan of care, and a handout to give to the patient and family for fall prevention education. Findings included a significantly lower fall rate for intervention units and an even higher significance in reduction of falls in patients over age 65. While the sample size met power analysis requirements, the use of several fall prevention interventions does not allow the identification of the most effective intervention for the prevention of falls. Also, the health information technology was organizationally developed for this purpose.

Only two studies were found comparing educational methods for the hospitalized patient each using a health behavior framework in designing the content of the education to reduce falls in hospitals. These research studies provide some evidence for the use of multimedia patient education as compared to written education material for cognitively intact older adults; unfortunately both were Australian studies limiting usefulness of the sample and the intervention due to health care organizational and cultural differences. However, support for use of a health belief model to guide educational program development is strengthened by these studies.

Designing a Falls Prevention Patient and Family Education Plan

The theory of planned behavior and social support theory was utilized to guide the development of a patient and family education plan. VonDras & Madey (2004) conclude the theory of planned behavior components and social support by close family or friends offer an integrated model for health interventions. Therefore the education plan was designed to offer the patient and family instruction related to the three determinants of the theory of planned behavior. Family members were provided messages on their role to provide emotional and instrumental support to assist the patient to follow risk reduction strategies.

According to the theory of planned behavior the intention to perform a behavior is predicated on what and how strong the motivational factors are that influence that behavior (Ajzen, 1991). There are three independent determinants within the theory of planned behavior which influence intention to perform a behavior; attitude toward the behavior, subjective norms, and perceived behavioral control. (Ajzen, 1991; Edberg,

2007). While no studies were found using the theory of planned behavior for studying patient's fall prevention behavior in the hospital setting, the findings from studies reviewed may indicate how these determinants are relevant in the context of a falls prevention education program for patients and families.

For patients to develop a healthy attitude toward using fall prevention strategies during hospitalization they need to understand the prevalence, adverse consequences, and risk factors related to falling. Some research suggests that older adult patients in the hospital are at higher risk of falling related to increased age, loss of balance and weakness, medications, cognition, toileting, time of day, ambulating unassisted in their rooms, environmental factors, and the existence of multiple comorbidities (Hitcho et al., 2004; Tzeng, 2010; Krauss et al., 2007; Carroll et al., 2010; Bates et al., 1995; Tzeng, 2010; Tzeng & Yin, 2009).

Kloseck, Crilly, & Gibson (2008) reviewed literature to explore the possible role of personality theory related to behavioral risk factors that may contribute to a patient falling and healthy attitudes toward fall prevention strategies. These authors reviewed factors such as personality traits which perpetuate risk taking behavior. This risk taking personality trait may contribute to those same individuals, as they age, to take risks when they also have a normal aging decline in the ability to attend. These factors may lead to a higher likelihood of falling. In such cases, these patient attitudes toward falling would be to take the risk, as their previous experiences may not have been with negative outcomes, but now with related inability to attend, leads to a fall. Similarly, some older people do not believe falls education is relative to them as they see this education is only for the

disabled person (Yardley, et al., 2006). This belief would interfere with a patient's attitude for being at risk of falling while in a hospital.

Educational messages to promote healthy attitudes to comply with fall prevention strategies should be considered to adequately portray the risks and adverse consequences that are realities when older patients fall. These messages should include such information as falls being the leading cause of injury death (CDC, 2005) and the most frequently occurring adverse event in hospitals (Currie, 2008). The evidence that falls with injury result in a longer stay in the hospital (Bates et al. 1995; Wong et al., 2011) should also be included. Providing the strategies to alleviate such risk factors as falls related to toileting and medications should give the patient a sense of control over these risk factors. Messages regarding the use of evidence based guidelines and resultant reduction of hospital based falls would be a positive message of hope to promote a positive attitude for compliance. Family members should be educated on their role to assure proper foot wear that is slip resistant and to insist that the patient does not get out of bed unless they have the hospital slip resistant socks are worn to ambulate and do so with assistance. Families should understand that they can influence the patient to avoid taking risks and follow prevention strategies.

Subjective norms as a determinant of the theory of planned behavior may also be found in the literature reviewed. For patients in an acute care setting, even though the standard of care is to instruct the patient to use the call bell prior to getting up, there is evidence illustrating that patient's do not consistently follow the instructions because they wish to avoid bothering the busy nurse (Carroll, Dykes, & Hurley, 2010). Patients

perceive asking for assistance as socially unacceptable when that person is busy. In the interviews by Yardley et al. (2006) older people viewed falls prevention messages as a threat to their autonomy and independence. Subjective norms in this case dictate a high regard for remaining independent.

Carroll, Dykes, and Hurley (2010) recommended that patients need to be educated by the nurse to assure them that patients are not a bother and assisting them is the work for the nurse, regardless of perceived availability. This is a crucial message around perceived social norms that must be included in the education and family support messages provided to the patient around this subjective norm. Messages regarding the hospital as no place for risk taking behaviors is necessary. This information should be framed as a positive message of autonomy in preventing the patient's own fall injury. Encouraging this new subjective norm will be a role for the family in supporting patients to call for the nurse, be patient, and not take risks.

The third determinant of the theory of planned behavior is perceived behavioral control. Among the studies reviewed, patients reported environmental risk factors which are impediments to their safety related to falling in a hospital and not within their control. Availability of ambulatory devices, cluttered rooms, beds left in a high position, time delays in nurses answering call bells, and lack of pull bars were reported as barriers to their ability to be compliant with falls prevention strategies (Hitcho, et al., 2004; Tzeng & Yin, 2009). For patients to believe there are no impediments to their ability to practice fall prevention strategies, these barriers must be understood and acted upon and patients must be given the permission to ask hospital staff to remove the barriers.

Education related to perceived behavioral control must put the patient as captain of their own destiny. Messages to assure the patient that hospital personnel wish to provide them with a safe environment are necessary. The message that access to ambulatory devices, a clean and clutter free room, and a bed that is always in low position when the patient is not receiving treatments are to be expected by the patient. Instructing the patient or family to have staff attend to these environmental necessities before leaving the room is expected of them and not viewed as demanding. Family members must understand that before they leave the room they must assure the environment is clear of hazards and personal devices are within reach, and they must also remind the patient why this is important to preventing a fall.

There is evidence supporting education delivery in a multimedia format. However the setting for both of the studies using multimedia formats was Austrailia, which prevents the use of the same multimedia program due to cultural and linguistic differences between the Australian and American population (Hill et al., 2009; Hitcho et al., 2004). While a commercially prepared falls education video is available (Envision, 2012), this video does not include educational messages for the family or support person regarding their role assisting the patient to prevent falls while in the hospital.

Conclusion

Available literature supports using the theory of planned behavior and social support theory to guide the development of a falls prevention education program and social support of family to influence patient's compliance with fall prevention strategies.

Section III Method

The study utilized a quasi-experimental two group design with a Phase 1

comparison group and Phase 2 intervention group. The study sought to determine if an

evidence based falls prevention video for older adult patients and their families with the

patient reduced falls and falls with injury. Both Phase 1 and Phase 2 groups received

usual care for all patients as defined by the study unit protocols on fall prevention. This

included unit orientation, a falls education brochure, and a fall risk assessment tool

completed on every patient every twelve hours to determine each patient's risk for

falling. Patients then receive fall prevention interventions based on their fall risk score of

high, medium, or low. These interventions may include yellow slip resistant socks,

yellow arm bands, bed alarms, and staff remaining in the bathroom with patients while

toileting.

Samples of convenience were used during both phases of the study. In the first

Phase comparison group falls and falls with injury in the consented patients were

measured. In the second Phase intervention group falls and falls with injury in consented

patients were measured. The intervention group was shown an evidence based falls

prevention education video, with education messages for patient and family, via the

television system in the patient's hospital room. The video intervention was in addition

to usual care for fall prevention on the study unit, with usual care including the fall

prevention brochure given to every patient. The video content based on the theory of

planned behavior and social support theory was shown following consent of the patient

and family when available. After viewing the video a Registered Nurse used teach-back

with the patient. Phase 1 study period was October through December of 2012 and Phase 2 study period was from February through April of 2013.

Hypothesis

The study tested the following hypothesis:

Hypothesis – A group of older adult cognitively intact patients receiving an evidence based falls prevention video and targeted family support will have fewer falls and falls with injury than a control group receiving usual care in the form of a written brochure.

Setting and Sample

The study was conducted in a 36 bed adult medical acute care unit in a 238 bed community hospital. The study unit averages 274 admissions and transfers to the unit per month and of these admissions and transfers, 194 patients are 60 years of age and older. This rural designated hospital is part of an 11 hospital integrated healthcare delivery system in the Mid-Atlantic portion of the United States. The patient population on this unit includes non telemetry medical patients and a small percentage of oncology patients. The unit nursing care is provided by Registered Nurses, Patient Care Technicians, and Registered Nurse Case Managers who received education on the content of the video and study methods. This unit had been chosen in 2011 to pilot implementation of falls reduction strategies as outlined in the ICSI guideline "Prevention of falls (acute care). Health care protocol" (ICSI, 2010; Degelau, et.al, 2012). After moving to a new replacement facility the organization experienced an increase in fall rates in the acute care units. The unit was chosen to study fall reduction strategies as it had the most

opportunity for reduction at that time with a 5.93 total fall rate and 1.50 falls with injury

rate for the year 2011. Therefore, this current study was an extension of implementing

the protocol strategies for fall reduction when a gap in availability of falls prevention

education for acute care was found.

The organization is the primary health care provider for approximately 215,000

residents with over 14,700 annual admissions and a 47% Medicare payer mix. There are

three universities and a community college within the service area and three retirement

communities. Cultural diversity of the population served is evidenced by the

organization providing over 3500 Spanish speaking interpreter calls during a previous

twelve month period in addition to employed Spanish speaking interpreters.

A sample of convenience served as the study population for the intervention and

comparison groups for the study. The criteria for inclusion in Phase 1 and 2 of the study

were as follows:

1. Patients admitted or transferred to acute care medical unit, 3W

2. Adult age 60 and over

3. Patient's with or without a family support

4. English or Spanish speaking

5. Consent to participate

6. Absence of diagnosis related to dementia, confusion, Alzheimer's, or other

   cognitive disability

Interventions

The treatment intervention consisted of the patient, and family member when available, viewing an evidenced based video on prevention of falls in the acute care setting. Evidence based messages for falls prevention were developed based on a review of the literature, the theory of planned behavior, and social support theory. The researcher collaborated with a professional communication and marketing team to develop message concepts and a content outline addressing the three determinants of the theory of planned behavior and social support theory for messages to guide family to support the patient in behaviors to prevent falls.

Development of the educational messages incorporated the social marketing planning process (Appendix B) to develop falls prevention messages and communication strategies in the creation of an evidence based falls prevention video for the target population (US Department, 2005). Horsburgh (2003) and Russell & Gregory (2003) described the need for purposive sampling in order to obtain relevant qualitative data. Therefore messages were pretested by reviewing key messages from the content outline presented in a power point format with three English speaking patients on the study unit who met the inclusion criteria. The patients interviewed to pretest the messages included one male who had fallen while on the study unit, one male who had not experienced a fall, and a female who had fallen and injured herself prior to admission. No Spanish speaking patients were available for interview during the time available for pretesting messages.

Pretesting serves to determine how the intended audience may react to different concepts or messages (US Department, 2005). Russell & Gregory (2003) discussed the ability to review already published qualitative data which focused on the subject under study when determining sample size for qualitative investigations. Such published data has been presented in the literature review, was evident in the pretesting with patients, and allowed for a small sample size for the purpose of determining reactions to messages. The content outline used to produce the video was edited based on the pretested patient's responses to these power point messages and is available as Appendix D. The final content outline was reviewed by the organization's Cultural Coordinator who found no messages that may conflict with cultural norms.

The video delivers messages from the content outline by a narrator, two Registered Nurses, and a family member based on the theory of planned behavior and social support theory. Review of previous falls in the organization failed to identify a patient who would have been included in the video. A family member identified as an advocate for a current patient at risk of falling was approached and agreed to participate. This family member had previously experienced the loss of a parent due to a serious injury and eventual death related to a fall in another facility. The family member's parent had gotten up without assistance, believing she could walk, fractured a hip, and died within 3 weeks.

The content of the video addresses educating the patient to prevalence and consequences of a fall and risk factors associated with an acute illness which has required hospitalization. Education on risk factors of medications, weakness, urgency to toilet,

older age, and failure to call the nurse before attempting to ambulate targets the patient's attitude to behave in ways to prevent falling. The messages contain prevalence and consequences of falls in hospitals, such as hip fracture injuries, head injuries, and death. Content also includes messages that the nurses in the organization do not want patients to fall and they are never "bothered" when a patient rings their bell, or when the patient asks for their assistive devices to be moved closer. Patient control messages target the patient's autonomy and control to keep themselves safe by not taking unnecessary risks while hospitalized, using their call bell, and assistive ambulatory devices if ordered. Family member messages center on their role to remind the patient of prevention behaviors that they must follow and support the patient in performing prevention behaviors to meet the goal of no falls while in the hospital.

During Phase 2, the Registered Nurse or Patient Care Technician activated the video for consented patients and family members. The video was shown over the television in the patient's room. Upon completion of the video a Registered Nurse was to ask the patient to describe one thing that the patient learned that they can do to prevent falling (teach-back), ask the patient if they have questions, and document that the video was viewed, by whom, and that teachback occurred. The Registered Nurses were educated to this process prior to Phase 2 study period and reminded in staff meetings and weekly emails by the unit manager.

Teach-back is a recommended best practice to assure patient's understanding of the health education content being delivered and utilized in this study for its efficiency as compared to that of the one to one health counselor follow up method by Haines et.al.,

(2011). The Institute of Healthcare Improvement endorses the use of teach-back and provides a "tool kit" for instructional purposes (IHI, 2013). The National Quality Forum also endorses teach-back as a safe practice when obtaining informed consent (NHQ, 2013) and Kripalani, Bengtzen, Henderson, & Terry (2008) utilized teach-back in a study when obtaining informed consent with low-literacy populations and found it to be a "preferred method" (p. 17). Nurses have also designed studies around the use of teach-back with positive results to improve the patient's understanding at discharge (Kornburger, et.al., 2013) and self care in heart failure patients (Howie-Esquivel, White, Carroll, & Brinker, 2011).

The Phase 1 comparison group received usual care in the form of a brochure given to all patients and families to read (Appendix E). This brochure was developed by two of the organization's Registered Nurses as a project for Clinical Ladder progression and based on the same review of the literature as utilized for the treatment video. Unit Registered Nurses were to provide the brochure on admission to all patients for review by the patient and document in the patient's electronic medical record that the brochure was given to the patient. The Registered Nurses were educated to this process prior to the Phase 1 study period and reminded in staff meetings and weekly emails by the unit manager.

Variable and Measurement

Dependent variables measured are falls and falls with injury collected by review of fall huddle reports and compared to an electronic report from the medical record documentation. The study data measures include baseline participant characteristic data,

participant lengths of stay (LOS), participant falls, and participant falls with injuries.

Participant characteristics collected and utilized for analysis includes age, gender, race, and primary language. Measurement definition of a fall and fall with injury follows the ICSI "Prevention of falls (acute care). Health care protocol" (ICSI, 2010) definition below:

> Falls: a fall is defined as any unplanned descent to the floor.
>
> Falls with injury: categorized on a 5 point scale:
>
> 1. No apparent injury
>
> 2. Minor: bruises or abrasions as a result of the fall
>
> 3. Moderate: an injury that causes tube or line displacement, a fracture, or a laceration that requires repair
>
> 4. Major: injury that requires surgery or a move to intensive care unit for monitoring a life-threatening injury
>
> 5. Death
>
> For study purposes, fall rates were defined as falls in category 1 and falls with injury rates to include categories 2 through 5.

Demographic and length of stay data were collected from the participant's medical record by electronic query.

A paper fall huddle report (see Appendix F) and electronic queries of nursing documentation from the patient electronic medical records is used by the organization in which the study took place to capture patient falls. The fall huddle report form is completed immediately after a fall when the nursing staff and manager "huddles" to

assess causes for the fall and update the plan of care to prevent future falls. The huddle reports are sent by personnel in the unit where the patient fell to the Chair of the Falls Steering Committee and then to the Quality and Risk Department to correlate with the electronically queried falls report to assure all falls are captured. This data is then categorized as a fall or fall with injury as based on the definitions outlined. Data were reviewed from the fall huddle reports of two patient falls which occurred during the study for analysis of potential trends.

Research Procedures

The initial design used the trained unit Registered Nurse Case Manager and Charge Nurses to attempt consent on patients meeting inclusion criteria. A daily electronic report of all patients currently on the study unit was developed and included the patient name, room location, age, and current status of consent. Review of the report was to occur between the Registered Nurse Case Manager and Charge Nurse to validate patients' current cognitive function. A review of the consent process after the first month of Phase 1 found that patients meeting study criteria were not being approached for participation in the study. It was determined that in order to consistently allow more patients meeting study criteria to have opportunity to participate in the study dedicated staff would be necessary to systematically attempt to consent patients.

A decision to utilize trained Patient Care Technicians to consent participants was implemented in December. The trained Patient Care Technicians were scheduled for several hours per day, Monday through Friday, for the remainder of the study in order to dedicate time to the consenting process. Past history of cognitive diagnosis was added to

the daily electronic report. The Patient Care Technicians utilized the electronic report and reviewed cognitive status of the patient's without prior cognitive diagnosis with the Charge nurse prior to consenting patients meeting inclusion criteria for the study. Consenting of patients did not occur on the weekends for both Phases of the study due to resource limitations.

During Phase 2, the falls prevention video was initiated by the unit Registered Nurse or Patient Care Technician. The unit's Registered Nurses were educated to initiate the video when notified of completion of informed consent and to document this intervention in the medical record. However, to streamline the procedure, the Patient Care Technicians began initiating the video following consent procedures and notifying the patient's assigned Registered Nurse to discuss the video with the patient. This change was implemented midway through Phase 2.

Ethics and Confidentiality

The informed consent forms utilized in the study for intervention and comparison participants is available for review in Appendix G and Appendix H which contain statements of no known risks for participants and possible benefits to the participant during the study. Approvals for the study were obtained from the Investigational Review Boards of the study organization and the University of Virginia where this researcher is a Doctoral student. Institutional Review Board approved the addition of trained Patient Care Technicians who were dedicated several hours per day (except on weekends) to consent patients meeting study criteria. Copies of these approvals are available in Appendix I. Patient level data will only be reported or published in aggregate to protect

the confidentiality of staff and patients. No adverse events occurred during the study.

There are no currently identified conflict of interest issues related to this study.

Data Analysis

All statistical tests were performed using SPSS software v. 21 by an employed

University of Virginia PhD nursing student. Frequencies and means were calculated for

sample characteristics. Phase 1 and Phase 2 groups were compared on demographic

characteristics and length of stay variable using appropriate statistical tests such as the t-

test and chi-square. Due to positive skewness of the length of stay variable, the Mann

Whitney U test was used to compare mean ranks. Generally chi-square test was used to

check differences for the delivery of interventions between groups. All statistical

significance tests were set at $p < 0.05$. Fall and fall with injury rates were calculated per

1000 patient days. Effect size was calculated for strength of association using the

Pearson r. Fall huddle reports for two patient falls during the study were analyzed for

comparison of variables.

Journal Submission

The study will be prepared as a manuscript according to the *Journal of Nursing

Care Quality* author guidelines and submitted for publication (Appendix J).

<div align="center">

Section IV: Results

</div>

Findings

During the study Phase 1 and Phase 2, 1897 patients were admitted or transferred

into the study unit setting. Of the 630 patients admitted or transferred to the study unit

during Phase 1, a small portion of patients consented to participate in the study ($N = 100$,

16%) and a smaller portion of patients ($N = 74$, 12%) declined to participate. The

majority of patients admitted or transferred to the study unit during Phase 1 ($N = 456$,

72%) were either not eligible or consent was not attempted. In Phase 2 a similar portion

($N = 92$, 16%) of the 565 patients admitted or transferred to the study unit consented to

participate in the study and one forth ($N = 143$, 25%) of the patients declined to

participate. A little more than half ($N = 330$, 58%) of the patients in Phase 2 were either

not eligible to participate or for which consent was not attempted. Less than a fifth ($N =$

17, 19%) of patients' family/significant others consented to participate in the study

during Phase 2. A higher proportion of patients declined during Phase 2 which may

reflect an increased number of patients approached to participate in Phase 2.

Demographic and length of stay characteristics between groups are summarized in

Table 1 (Appendix K). Phase 1 control group ($N = 100$) and Phase 2 study group ($N =$

92) met desired target group sample size of 30 that would provide 80% power to detect

differences between groups (Wilson Van Voorhis & Morgan, 2007). Statistical analysis

revealed no missing data. There were no statistically significant differences in

characteristics between groups.

There were no statistical differences in mean age between the groups, t (190) = -

.095, $p = .92$. Chi-square tests for association were conducted to determine whether

differences between groups existed for gender, language, and race. The majority of the

participants in both groups were female. In Phase 1 64 (64%) were female and in Phase 2

group 56 (61%) were female with no statistical differences found for gender between the

groups $\chi2(1, N = 192) = 0.20$, $p = .33$. Nearly all of the participants were English

speaking in both groups with the exception of 1 (1%) participant who spoke Spanish in

the Phase 2 group. Because there were less than 5 participants who did not speak

English, the Fisher's Exact Test was performed finding no statistical differences between

groups based on language $\chi2(1, N = 192) = 1.09$, p = .24. The Yates's Continuity

Correction Chi-square test for association was conducted for race given the smaller than

expected count in races other than Caucasian. This test adjusts for drastic proportions of

differences in samples (Vogt, 1999). A 2-level race variable (Caucasian vs. other)

resulted in no statistically significant differences between the groups for race $\chi2(1, N = 192) = 1.09$, p = .12. The use of chi-square Mann-Whitney U test for association

revealed no statistical differences in length of stay characteristic between groups $U = 4,858$, $p = .25$.

Less than half ($N = 42$, 42%) of consented participants in Phase 1 had

documentation in their medical record that the falls prevention brochure had been

provided. A similar number of consented patients in Phase 2 had documentation in their

medical record that they received the falls prevention brochure ($N = 44$, 48%). A review

of the medical records of participants in Phase 2 indicated that a third of the sample ($N = 33$, 36%) received both the falls education brochure and video. A fourth of the

participants in Phase 2 ($N = 24$, 26%) viewed the video and did not receive the falls

education brochure. A small portion of participants in Phase 2 ($N = 7$, 8%) had

documentation of viewing the video with their family/significant other even though this

represents less than half the number of family/significant others who consented to

participate ($N = 17$). In total, patients who viewed the video during Phase 2 with or

without receiving a brochure or having a family member view the video, accounted for more than two thirds ($N = 64$, 70%) of the Phase 2 participants. The fidelity of the intervention of teach-back following the patient viewing the video was strong as the teach-back was documented as occurring in the majority of those who viewed the video ($N = 60$, 94%).

Interestingly, in Phase 2, the majority (82%) of participants received a falls education intervention (brochure or falls education brochure and video) while in Phase 1 less than half (42%) of participants received a falls education intervention (brochure). There was a statistically significant difference between groups in the proportion of patients receiving any kind of falls educational intervention based on the study phase they were in, $\chi 2(1, N = 192) = 0.20$, $p < .001$. The effect size for this analysis (Phi = .41) was found to exceed Cohen's (1992) convention for a medium effect ($r = 0.30$).

Two falls occurred without injury during Phase 1 and no falls or falls with injury occurred during Phase 2. Because there were fewer than 5 falls, the Fisher's Exact Test was performed resulting in no statistical difference between groups by number of falls $\chi 2(1, N = 192) = 1.86$, $p = .270$. The effect size for this analysis (Phi = .10) was found to just meet Cohen's convention for a small effect ($r = 0.10$). Results for falls and falls with injury rates were calculated based on 1000 patient days. Phase 1 fall rate was 6.01 (2 falls/333 patient days x 1000 patient days). Phase 2 fall rate was 0.0 (0 falls/347 patient days x 1000 patient days). The low number of falls during both Phases did not allow for a statistical difference between the Phase 1 and Phase 2 groups nor the ability to run any

statistical analysis for differences between rates. No falls with injury occurred in either Phase 1 or Phase 2.

Comparison of Post-Fall Huddle Forms between the patient falls revealed falls occurred within 2 and 5 hours following administration of opiates for pain and occurred when the male patients attempted to toilet without calling for the nurse. Nursing had performed rounds on each patient within an hour of the patient's fall. The risk assessment tools scored one patient as a moderate risk and the other as a high risk, with one patient having a history of a fall at home within the past six months. Only one of the fall patients had documentation of receiving the fall prevention brochure. Neither fall resulted in an injury.

Discussion

The purpose of the study was to reduce falls and falls with injury in the older hospitalized adult. Viewing of a falls prevention education video by the patient and family support member was intended to increase the patient's knowledge of fall risk, influence their behavioral intent to follow fall prevention strategies, and improve understanding by the family support member on their role in supporting the patient in fall prevention behaviors. The study hypothesized that a group of older adult cognitively intact patients receiving an evidence based falls prevention video and targeted family support would have fewer falls and falls with injury than a comparison group receiving usual care in the form of a written brochure. Although the hypothesis was rejected there may be clinically significant findings related to providing evidence based fall prevention education to patients based on the theory of planned behavior.

No statistical evidence was found to support the study hypothesis due to the small number of patients with a family support consenting and viewing the evidence based falls prevention video ($N = 7$). The small number of falls occurring during either Phase of the study prevented planned statistical analysis for comparison of the two study Phase groups.

While the study did not reinforce social support theory as a component for the theoretical model (Appendix A), the study may indicate the benefit for use of evidence based messages with patients based on the theory of planned behavior when measuring and comparing fall rates from a clinically significant improvement aspect. The clinical significance derives from findings that the majority of patients (82%) in Phase 2 received the brochure and/or video fall prevention education with messages based on the theory of planned behavior and fell less frequently (0 per 1000 patient days) than patients in the Phase 1 compare group. Phase 1 compare group participants received a falls education brochure less than half the time (42%) and fell more frequently (6.01 per 1000 patient days).

Acute care hospitals are today benchmarked on the quality of their falls prevention program by their falls and falls with injury rates. Indeed, the standards of the American Nurses Credentialing Center's Magnet Recognition Program® set the expectation for hospitals to outperform nationally benchmarked mean comparisons for nurse sensitive indicators such as fall rates (ANCC, 2008). The National Database of Nurse Sensitive Indicators (NDNQI) is one source of national benchmark data for nurse sensitive indicators and used by many hospitals. NDNQI develops rank comparisons on

falls and falls with injury rates to like units from the database for member hospitals (NDNQI, 2013).

The comparison of rates between Phase 1 brochure group and Phase 2 brochure and video group holds clinical significance when comparing a Phase 1 fall rate of 6.01 to a Phase 2 fall rate of 0. Of significance to this study, the NDNQI mean fall rate for the 746 like units for comparison to the study unit in the fourth quarter 2012 (Phase 1) was 3.81 (S.D. 2.13) as compared to the Phase 1 participant fall rate of 6.01 (approached the 90th percentile performance for this quarter benchmark). The NDNQI mean fall rate for the first quarter 2013 (Phase 2) for 768 like units for comparison was 3.60 (S.D. 2.06) as compared to the study unit's participant rate of 0 (below the 10th percentile in comparison group). While there is no evidence based on a statistical difference in fall rates between the groups, these national benchmark comparisons are important in light of the statistical differences and effect size between the groups in the percentage of patients who received any type of fall prevention education.

The statistical differences in the percentage of patients who received any type of falls prevention education between the Phase 1 and Phase 2 groups, $\chi2(1, N = 192)$ $=0.20$, $p < .001$, may corroborate previous study findings. Hill et al., (2009) compared DVD education, workbook education and a control group receiving no education. This study did not include a variable measure of falls or falls with injury, but rather measured the participants improvements in knowledge of falls and prevention based on messages using the Health Belief Model, another individual health behavior theory similar to the theory of planned behavior. Hill and colleagues surveyed the participants' knowledge on

falls and fall prevention strategies following education by either a workbook or DVD. While the DVD group was found more likely to be motivated and engaged in fall prevention, both groups receiving either education method provided higher knowledge survey results than that of the control group ($p < .001$). Phase 2 results of this current study indicate a high percentage of patients received the video education (70%) as a targeted intervention and a statistically significant difference in the number of patients receiving any falls education between Phase 1 (42%) and Phase 2 (82%). Thus the lower fall rates in Phase 2 of this current study may be consistent with Hill and colleagues previous work where both the DVD and workbook method served to produce survey results for knowledge related to falls and fall prevention.

The current study findings for lower fall rates for older adults receiving falls prevention education followed by teach-back may also be consistent with previous research by Haines et.al. (2011). This previous study, a randomized 3-group trial, compared a video and written materials falls prevention education intervention with follow up by a health counselor, a video and written materials only intervention, and no specific falls education control group. The sample included participants 60 years of age and older, a diversity of patient populations, as well as cognitively impaired participants. After controlling for cognitively impaired participants, Haines et.al. (2011) found that fall rates were much lower in the cognitively intact group receiving video and written materials with a health counselor follow up (4.01 per 1000 patient days) than the video and materials only group (8.18 per 1000 patient days). The health counselor follow up in this pervious study was time intensive taking between 20 and 36 minutes per patient and

study design allowed a week for this counseling to occur. Both intervention groups with cognitively impaired participants removed had lower fall rates than did the control group with cognitively impaired participants removed (8.72 per 1000 patient days).

During Phase 2 of this current study almost 70% of participants viewed a falls education video and a majority (94 %) of these participants received follow up by way of teach-back by the Registered Nurse. The resultant fall rate of 0 during Phase 2 compared to Phase 1 fall rate of 6.01 corroborates the Haines et.al., (2011) findings for fall rate reductions when patients viewed a video, were given a written workbook, and had follow up by a health counselor . While only a third of participants in Phase 2 received both the video and brochure, the current study results are consistent with Haines et.al., (2011) findings of a reduced fall rate when some type of follow up is introduced after the patient views the video. The teachback method following a patient viewing of the education video was designed as a proxy for the follow up intervention described by Haines et.al. (2011) in a manner less resource intensive.

Interestingly, implementing the falls education video in Phase 2 increased the number of patients overall who received some type of education; 82% received either the brochure alone or the brochure and the video, while in Phase 1 only 42% received the brochure only. The fidelity of patients receiving the brochure during Phase 2 was not so different (48%) than during Phase 1 (42%). Therefore there might be some association for patients in Phase 2 receiving falls prevention education by video (70%), and teach-back performed the majority of the time (94%), with falling less frequently than patients receiving usual care including the brochure. Analysis revealed a statistically significant

difference between these groups related to patients receiving falls prevention education and the effect size for this difference exceeded Cohen's (1992) convention for a medium effect. Coe (2002) when comparing effects size to the use of statistical tests states "Effect size emphasizes the size of the difference rather than confounding this with sample size" (p. 1). Ferguson (2009) defines effect size as a means to "estimate the magnitude of effect or association between two or more variables" (p. 1).

Although the small numbers of falls in either group hindered analysis of statistical comparison for falls between groups, the effect size met Cohen's (1992) convention of 0.10 for a small size effect. Durlak, (2009) discusses the need for researchers to evaluate the practical or clinical significance in the context of "the extent to which there has been a meaningful change in participants' lives" (p. 924). Durlak (2009) expands on this by instructing researchers to interpret the effect size in relation to how difficult an outcome is to obtain when evaluating clinical significance. An effect size of 0.10 with an outcome that is difficult to obtain may be of greater clinical significance than an effect size of 0.50 when the outcome is relatively easy to obtain or less critical to the health of participants (Durlak, 2009). Falls in the acute care setting have been a difficult problem to eradicate and at times devastating to the life of the older adult. Therefore this small effect size finding may be of clinical significance in the search for fall prevention interventions. This observation, in light of effect size and previous research findings, may support the use of multimedia education with teach-back over written material as an educational intervention to prevent falls.

After reviewing the information from the huddle reports of the two patients that fell during Phase 1, it was clear that both patients' reported attempting to toilet prior to falling. This supports the research of Tzeng (2010) and Hitcho et.al. (2004) who found that toileting without assistance accounts for between 45% (Tzeng, 2010) and 50% (Hitcho et.al, 2004) of patient falls. This message is included in the falls education brochure and video. These patients had also received opiates for pain within 5 hours of falling. Hitcho et.al. (2004) found that 58% of falls occurred in patients receiving central nervous system medications. The brochure and video contain messages regarding effects of new medications.

Limitations

In is important to note the limitations of this study. First, the study was conducted in only one unit in one acute care facility. The study needs to be conducted in different types of units in multiple health care organizations. Second, the sample size was too small to conduct the planned statistical analysis. The small sample size was likely related to the failure of nursing personnel to consistently perform and/or document interventions, and the difficulty in procuring consent from both patients and families. Third, the relatively short duration of the study was a limitation.

During Phase 1, staff nurses who functioned in their usual capacity of caring for patients were expected to consent patients. The expectation was unrealistic and thus, patients who met the criteria were not approached for inclusion in the study.   During the final month of Phase 1 and during Phase 2, patient care technicians were trained to obtain consent from patients and families. Limited resources prevented providing support for

obtaining consent 7 days per week and even providing additional support 5 days per week

for several hours per day was a stretch to the budgeted resources. Additionally, no test of

cognitive function was performed prior to consenting patients and therefore it is possible

that participants may have been included in the study that had some confusion or

cognitive impairment. Finally, patient care technicians found it difficult to obtain consent

because family members were often not visiting with the patient at times the technicians

were present.

In addition to the difficulty in procuring consent, the falls prevention interventions

were not consistently documented. Despite the initial education program for the staff

nurses, weekly email reminders, and reminders at staff meeting, interventions were not

consistently provided to the patient and/or documented. Midway through Phase 2, patient

care technicians who had consented patients were also directed to provide the patient's

assigned nurse with a pink instruction document after activation the video. The

instruction sheet was designed to remind the nurse to document and provide teach-back.

Regardless of these consistent reminders and process changes, only 7 of the 17 family

members who consented to participate had documentation of viewing the video.

Investigators need to be cognizant of the resources required for obtaining consent from

patients and families.

The relatively short duration of the study was another limitation. Data were

collected from patients and families in one unit over a 3 month period for each Phase of

the study. Perhaps this was not enough time to capture the impact of the video and

brochures.

Implications for Future Research

In addition to replicating the study in different types of units in multiple health care organizations over a longer period of time, there are other implications for research. Future research might also be conducted to determine if allowing family members of cognitively impaired patients to view the video with teachback and measure the impact of falls for these patients.

Both the members of ICSI (2010) and Currie (2008) identify need for multifaceted interventions to reducing falls in the hospital setting. Future research should be conducted not only to determine the impact of this new video on patient falls, but also to determine which combinations of interventions are most effective in preventing falls.

Implications for Nursing Administrative Practice

Although the hypothesis was not supported, there were fewer falls in the Phase 2 intervention group than in Phase 1 comparison group. Thus, nursing leaders should indeed continue to implement and evaluate falls prevention protocols that include video based education and teach-back. Performance improvement monitoring within the organization's other inpatient units as the video is implemented on all inpatient units will provide further opportunity to measure the video intervention.   .

Implications for nursing leadership relates to the difficulty of implementing research based studies requiring consent of patients and consistency of documentation of intervention implementation. Systems and processes should be piloted and monitored prior to beginning the measurement period of a study in order to better hardwire the fidelity of the interventions, documentation of the interventions, and the processes for

consent of participants. Time and resources should be allocated to develop and test such

procedures in order to improve the power of the study findings. Boase, Kim, Craven &

Cohn (2011) interviewed nurses regarding their experiences delivering complex research

intervention in a randomized control study; a review of the results indicated that nurses

are challenged to implement research interventions due to time and competing demands

of their patient needs. Additionally, when depending on documentation to collect data,

there must be clear expectations on where and how this documentation occurs in the

electronic medical record and monitored prior to study implementation. When clinicians

do not document in the same manner electronic queries for auditing and measuring are

flawed. Larger sample sizes would make it impossible to manually determine the fidelity

of interventions.

As health care continues to be challenged to reduce costs and improve quality, it

is imperative that as nurse leaders we develop effective and efficient ways to assure our

patients are educated and motivated to follow behaviors that promote health. Theory and

evidence based education videos with teachback may be a technological tool to enhance

efficiency while also being effective. Further study of the model for this educational

video could provide a standard of practice to develop messages and education for

additional quality indicators where patients and families have some control or influence

over those outcomes.

Appendix A

Figure 1: Conceptual framework for an educational intervention of influencing intent to follow the fall protocol based on the theories of planned behavior and social support

Figure 1. Conceptual framework for an educational intervention for influencing intent to follow the falls protocol based on the theories of planned behavior and social support
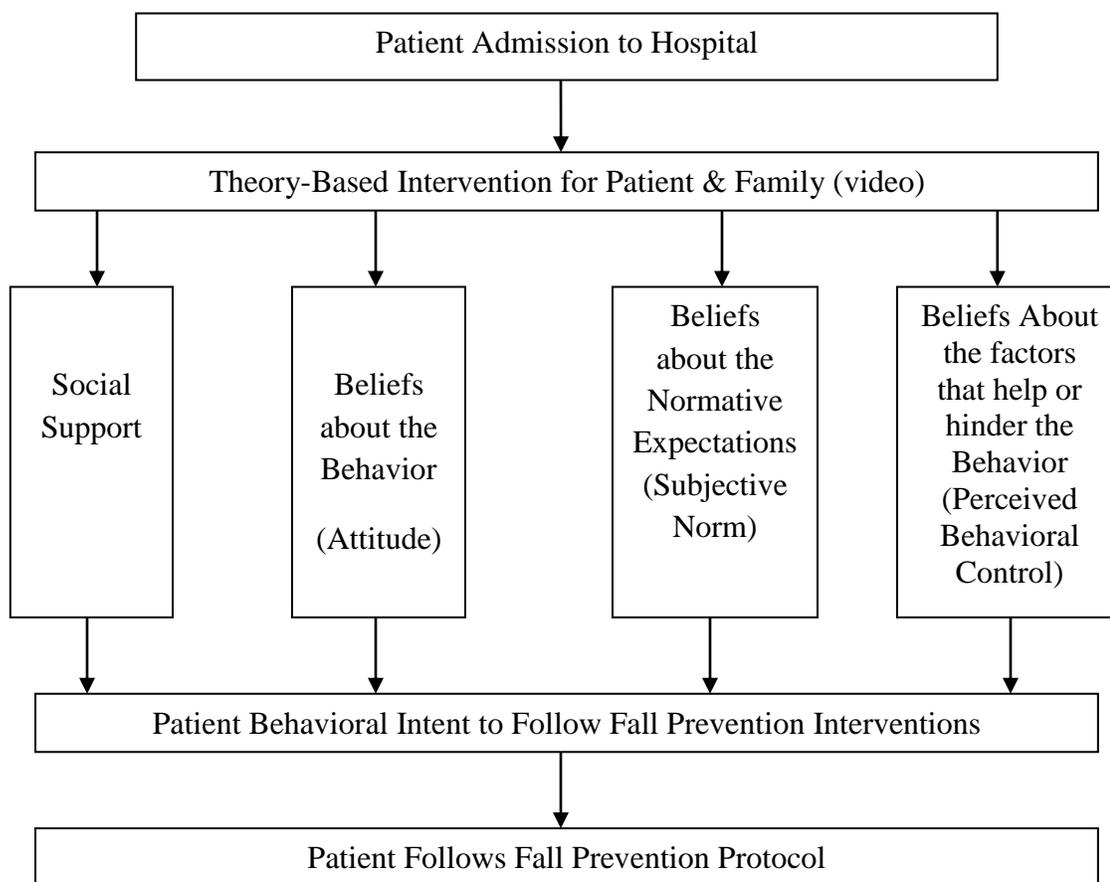
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┌─────────────────────────────────────────────────────────┐
│              Patient Admission to Hospital                │
└─────────────────────────────────────────────────────────┘
                            │
                            ▼
┌─────────────────────────────────────────────────────────┐
│    Theory-Based Intervention for Patient & Family (video) │
└─────────────────────────────────────────────────────────┘
      │              │                │               │
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┌──────────┐  ┌──────────┐  ┌──────────────┐  ┌──────────────┐
│          │  │          │  │   Beliefs    │  │ Beliefs About│
│          │  │          │  │  about the   │  │  the factors │
│  Social  │  │ Beliefs  │  │  Normative   │  │ that help or │
│ Support  │  │about the │  │ Expectations │  │  hinder the  │
│          │  │ Behavior │  │ (Subjective  │  │   Behavior   │
│          │  │          │  │   Norm)      │  │ (Perceived   │
│          │  │(Attitude)│  │              │  │  Behavioral  │
│          │  │          │  │              │  │   Control)   │
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      │              │                │               │
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┌─────────────────────────────────────────────────────────┐
│ Patient Behavioral Intent to Follow Fall Prevention Interventions │
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                            │
                            ▼
┌─────────────────────────────────────────────────────────┐
│        Patient Follows Fall Prevention Protocol           │
└─────────────────────────────────────────────────────────┘
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Figure 1. As depicted in the model, the patient enters the hospital with beliefs about the likely impact of behavior, normative expectations, and control over behavior as well as social support. The evidence based video is expected to influence these beliefs and prompt social support toward fall prevention behaviors.

Appendix B:

Table 1: Description of Qualitative Literature

Table 2: Description of Quantitative Literature

Table 1: Description of Qualitative Literature

Author	Purpose of study	Study Design: Type of Design	Rigor and Validity	Sample description and Number	Type of analysis	Major findings and implication
Carroll, Dykes, & Hurley (2010)	To explore the patient's experience of a fall and to gather information on ways of preventing falls in acute care hospitals.	Qualitative descriptive study design

Investigators tape-recorded individual patient interviews within 48 hours of their fall while an inpatient in an acute care hospital. | Investigators' roles defined. Two person consensus used for analysis. Employed a process of debriefing among researchers, engagement with the raw data and codes, and field data and reflective notes used to improve reliability and validity. | Patients referred by the nurse caring for the patient with patient's permission. Eligibility included a fall within 48 hours, cognitively intact, ability to communicate, and English speaking. 2 men and 7 women, age range 24-78, mean age | Verbatim interviews converted to NVivo software for coding and analysis. Two categories were identified to explain why these patients fell. Patients identified strategies they believed would help to prevent falls. | The need to toilet coupled with a loss of balance and weakness that was unexpected was identified as two categories explained by the participants. The loss of balance when experiencing an urgent need to toilet was the most reported reason for falling. Patients reported activities to reduce falls as: being involved in assessing their own limits, understanding their fall risk assessment, overcoming the emotional obstacle of not wanting to bother the nurse, and having proper ambulation devices available. The major implication is the patient's need to feel that they can ask for assistance before |

					61.2. N=9		ambulating.
Dykes et al. (2009)	To determine the views of registered nurses (RN's) and nursing assistants (NA's) as to why patients in acute care fall and how falls could be prevented.	Qualitative descriptive study design using audiotaped focus groups (4 RN and 4 NA groups) from four acute hospitals, two urban academic and two suburban teaching from the same hospital system	Methodology of the moderator led focus groups was provided. Raw data was coded using a two person consensus approach. Basic content analysis methods were used to interpret the data. Researchers were engaged through debriefing, engagement with the raw data and coding, and use of field notes. Small sample size however use of four hospital sites strengthened	Four focus group interviews with 3 to 10 RN's and four focus groups with 4 to 6 NA's from four acute care hospitals. Participants recruited by invitation and flyers. N=23 RN's N=19 NA's	Raw data was reviewed and corrected, removing identifying characteristics. Data was converted to NVivo software and open coded. Concepts were then linked.		Six concepts were developed to prevent patient falls including patient report, information access, signage, environment, teamwork and involving the patient and family. Facilitators and barriers were identified related to these concepts. A predictive conceptual model is presented on the likelihood of patients falling based on the data. Organizations must strengthen facilitators within two common categories; Knowledge/Communication and Capability/Actions, i.e., facilitated timely report, access to individual risk information for caregivers and patient/family and overcome barriers i.e., patients not

			generalizability.			following instructions, teamwork, access to equipment.
Hitcho et al. (2004)	To identify and analyze characteristics, circumstances, factors contributing to patient falls, fall rates by service area and staffing patterns. To measure the extent of serious injury resulting from inpatient falls and analyze risk factors for injury among those who fall.	Prospective Descriptive Study Falls in one academic medical center. Data from incident reports, patient medical records, and interviews with nurses and patients.	Some potential for bias existed. Method for assuring reliability between two researchers was not provided. Data from one academic medical center.	Sample included falls from a1300 bed academic medical center as reported in an electronic incident system over a 3 month period. Behavioral health and falls during physical therapy sessions excluded. Only first falls by patients were	Parametric and nonparametric analysis of data using SPSS for Windows. Data were double entered for accuracy.	Mean age of fallers 63.4 (range 17-96) however half (50%) of falls were due to elimination and more common in age 65 and older (83% vs. 48%; P=.001). 85% of falls occurred in the patient's room and 59% during the evening and night time. 29% of fallers reported using an assistive device at home but only 6% were using one when they fell in the hospital. 42% of falls resulted in some type of injury with elimination correlating with fall injuries (cOR, 2.5; 95% CI, 1.2 to 5.2). 8% of falls involved moderate to severe injury. Of patients who fell 81% were with general muscle weakness and 36% with urinary frequency. Of

				included. N= 183		medications administered within past 24 hours of falling, central nervous system drugs were administered to 58% of fallers and 56% received vasoactive/blood pressure agents. Implications for provision of assistive devices and routine elimination schedules. Many patients need education related to the effects of hospitalization i.e., new environment, medications, decreased activity, tests, and treatments may have and these factors require use of call bell for assistance.
Tzeng (2010)	Determine the prevalence of falls that are associated with toileting in the acute inpatient setting.	Qualitative retrospective study design of four adult inpatient acute units, in one suburban Michigan hospital using content	Researcher alone completed the content analysis which could result in bias. Clear account of methods provided. SPSS software for	Electronic incident reports of slip/falls defined as a patient found on the floor or lowered to the	Content analysis was used to code the nurse's narrative description of falls. The theme of each fall was coded to a single-choice variable and	Findings showed that 45.2% of the falls were toileting related. Of all falls, 78.2% were patients 65 and older with mean age 75.59. The most common toileting-related theme was when the patient was on the way from the bed

		analysis of the nurse incident reports on slip/falls over a three year period.	descriptive data analysis used.	floor. N=547	descriptive analysis findings were generated on the identified themes using SPSS software.	or chair to the bathroom or from the bathroom back to the bed or the chair. Strategies are needed to address patients' toileting needs to prevent falls.
Tzeng & Yin (2009)	To understand the opinions and observations of recently discharged senior patients about the fall-prevention program received during their most recent hospitalization, with a focus on the extrinsic risk factors for falls.	Qualitative cross-sectional exploratory study Three nurses and two occupational therapists collected data from home care patients discharged within 30 days from a hospital. Data was collected using a two sided, 1 page survey tool. Items were either single-item scales or open ended questions. Part of the survey	Survey tool was piloted. Data collectors received training and demonstrated understanding of the tool to assure interrater reliability. The survey questions were provided. Researchers followed up with data collectors 2 weeks into the study and were available for questions.	Medicare patients open to home care during an 8 month period, at least 65 years old, alert, and could independently communicate. 50.5% were men and mean age was 76.97. N=91	SPSS software was used to enter data, manage, and analyze the quantitative and content data. Open ended questions were categorized into themes using the authors own typology for the extrinsic factors. Descriptive, correlation analyses and chi-square tests were employed to examine the data.	57.1% of participants did not believe the fall-prevention program during their previous hospitalization was adequate. Bed height to high, insufficient fall-prevention education, lack of ambulation devices, provide more physical therapy, and clear pathways in the rooms with pull bars were suggestions made by participants. Feedback also included the need for nurses to repeat messages on falls frequently, monitor patients often, and answer call bells timely. In addition to environmental implications,

		was completed prior to the interview by looking at the patient's OASIS assessment data	Quantitative and content analyses were performed. Content analysis was conducted independently by each researcher after which a consensus was reached to ensure accuracy.			there is need to include a well designed patient education program with methods that engage the patient. Nurses need to incorporate visual cues as part of the patient's education. Increasing the repetition of fall prevention messages to patients is necessary.
Yardley et al. (2006)	To gain an understanding of older people's perceptions of falls prevention advice, and how best to design communications that will encourage older people to take action to prevent falls.	Qualitative descriptive study design Focus group interviews and one to one interviews for disabled homebound participants were deployed. Explored previous experience of messages	Small group formats, methodology explained. Interviews were audiotaped and fully transcribed. One researcher led the group and individual interviews and another recorded the speakers for	United Kingdom community dwelling older adults age 61 to 94 recruited. 18 men and 48 women participated. Recruitment messages were changed to recruit	Researchers all were involved in review of the transcripts. Themes were developed and constant comparison technique was used to examine the context of opinions. Critical review by all researchers was final step.	While there was general endorsement for the value of falls prevention education these older adults stated they may not use all the advice. Some agreed that it was useful but not for them, only the disabled elderly. Perceptions of negativity to the messages related to it being authoritarian and patronizing, belief that falls are inevitable, and the messages make the older person anxious and depressed.

| | | regarding falling. Examples of health promotion messages about falling prevention were presented. | accuracy. | healthy, less frail participants. N=66 | | Recommendation from participants was to promote exercise, incorporate the messages into general health promotion activities, provide messages as positive suggestions and give explanations and rationale. These findings imply that older people will deny their risk of falling to maintain dignity. For community dwellers, concentrating on positive balance improvement mobility rather than hazard messages. However, there also may need to be increased efforts on messages related to actual vulnerability for older adults to reduce the stigma. |
| VonDras & Madey (2004) | To explore the theory of planned behavior (TPB) and social support | Qualitative survey (postal and telephone) design using idiographic | Subjects randomly approached for inclusion. No benefits to participants. | Sample obtained from the Washington University Aging and | Age effects, demographic characteristics and study variables analyzed using Chi- | The predictive relationships of all aspects of TPB were observed in the study. Results suggest a high association between behavioral intent and |

| | influences on health goal attainment. | methodology. | 27.5% attrition rate reported as comparable. Surveys utilized previous research methodology. Interrater reliability measured for phase one review of health goals reported and consensus for category placement occurred in second phase review. Limitation identified due to utilization of a select sample. | Adult Development sample pool. Initial sample 400 with exclusions due to lack of response to postal survey, incomplete data, or no telephone survey. Mean age 59.3 and ratio of men to women 65:224 with one refusal to provide gender. N=290 | square and correlation. Multiple regression correlations analyzed for demographics, effects of attitudes, subjective norms, salient referent, perceived control, intention, specificity of plan of action, and social support. Analysis controlled for age. | support by family or friend (aspect of social support) accounting for 16% variance in predicting success to goal attainment. TPB subjective norms accounted for less than aspects of social support at 10% variance. Findings suggested older adults were more likely to report goals related to chronic medical issues and specificity of their plan was correlated with behavioral intention. The findings imply health interventions to require two frameworks, identifying and involving family/friend social support influences and TPB aspects for influencing healthy behaviors. |

Table 2: Description of Quantitative Studies

Author	Purpose of Study	Study Design: Type of Design	Hypothesis; Reliability	Variables: Dependent and Independent; Measurement (how variables are defined)	Sample description and Number	Type of Analysis	Major findings and implication
Bates et al. (1995)	1) Evaluate the correlates associated with serious falls in hospitalized patients 2) Evaluate the association between serious falls and medications 2) Determine an estimated total charges and additional length	Retrospective case-control study.	No statement of hypothesis given. Single hospital site increased reliability. Nurse abstracting blinded to case status. 10% sample of charts reviewed second time for reliability. Power analysis completed. IRB	Dependent variable- Presence of fall with injury. Independent variables- 37 variables including data on demo-graphics, admission physical exams, and variables present the day before fall. The Charlson co-morbidity score was utilized to calculate a score for	Case controls chosen randomly matching to serious falls cases by three month period dates of hospital-ization, gender, age, and length of stay before the fall. N= 62 Case	Univariate and multivar-iate analysis were used to determine correlation between the 37 indepen-dent variables.	Using univariate analysis only the CAM score (p=.005) and the Comorbidity score (p=.001) were significant correlates of falls. Medications were not statistically significant correlates of falls and the mean number of drugs within 24 hours (6.4 +/- 3.4 vs. 6.1 +/- 3.7) and number of drugs within 4 days (8.7 +/- 4.4 vs. 8.5 +/- 5.3) were similar in cases and controls. In the multivariate analysis only the Charlson comorbidity index (OR 1.4; 95% CI 1.1 to 1.7)

				comorbid conditions and the Confusion Assessment Method (CAM) instrument to determine presences of delirium. Utilization data included length of hospital stay, time in CCU, and charges.	Control Pairs		and the CAM score (OR 1.6; 95% CI 1.1 to 2.5 were independent correlates of a fall. Falls correlated with an increase length of stay (p<0.004) of 12 days longer and increased total charges (p<0.008) of $4,233 compared with controls. Multivariate analysis of resource utilization correlated with a 71% increase in length of stay and 61% higher total charges. The findings suggest confusion and comorbidities increase the risk of fall injuries and resource utilization is increased.
of stay associated with a serious fall		approved.					
Dykes et al. (2010)	To determine whether a fall prevention tool kit using health information technology (IT)	Cluster randomized study design	No stated hypothesis. A power analysis was conducted for a target sample of 5100	Primary Dependent Variable- patient falls per 1000 patient-days in targeted unit during study period.	All patients admitted to all study units during a 6 month study period.	Parametric analysis across treatment groups used. A	Tool kit outputs were printed for 93.2% of patients. Adherence in placing bed posters above the patient bed was 89%. Intervention units had a significantly lower fall

decreases patient falls in hospitals.		patients in each group. Control and intervention units randomized to control and intervention from four different hospitals. No other fall improvement efforts underway in any units. Adjusted for confounders between control and intervention demographics, even though not significantly different. IRB approved.	Secondary Dependent Variable- patient falls with injury. Fall defined as an "unplanned descent to the floor during the course of their hospital stay". Independent Variables- Use of IT fall prevention tool kit including the Morse Fall Scale (MFS) risk assessment, tailored bed poster above patient bed, tailored patient/family education, and tailored plan of care. Adherence measured for usual control group care and intervention	An inter-vention and control medical unit was matched in each of 4 urban US hospitals. Control Units, N=5104 Intervention Units, N= 5160	stratified Wilcoxon test and multi-nomial logistic regression completed to control for random-ization at the hospital level. Adherence measured through random assess-ment of MFS comple-tion in control units and use of the	rate (3.15; 95% CI, 2.54 – 3.90) than control units (4.18; 95% CI 3.45 – 5.06). The intervention effect in older patients was significantly different than in younger patients (P=.02). This study implies that effective assessment and communication among caregivers and education of patient/family may reduce falls in age 65 and older patients.

				group care.		tool kit in intervention units.	
Haines et al. (2011)	To determine if a patient education intervention is effective in isolation and equally effective for patients who have intact vs. those with impaired cognitive function.	Three group RCT

Two intervention groups receiving differing models of patient fall education and the third group receiving only usual care with no specific falls education model. | No stated hypothesis. Blinding to recruiters, data collectors, and statistical analysts. Randomization by computerized allocation sequence with masking protected. Power analysis was conducted. IRB approved. | Dependent Variable- patient falls, defined using the World Health Organization definition, "an event which results in a person coming to rest inadvertently on the ground or floor or other lower level." Independent variables- 1) written and video education materials and 1 to 1 follow-up with a health professional with content and pro-gression based on the health belief model 2) Written | Patients admitted to a mixture of acute care units and subacute care units in two Australian hospitals over 16 months.

Complete Program Intervention Group 1,

N= 401 Materials only Intervention | Analyses adjusted for whether patient treated on subacute or acute unit. Logistic regression used to compare patients with 1 or more falls between groups | Rate of falls was significantly lower among patients with intact cognition and allocated to the complete program group (4.01 falls per per 1000 patient days) compared with the rate of participants allocated to the control (8.72 falls per 1000 patient days) and materials-only group (8.18 falls per 1000 patient days). Patients with cognitive impairment who received the complete program fell at a significantly higher rate than those in the control group (7.49 vs. 2.89). There is some evidence that the, complete education program using 1 to 1 follow-up may reduce falls in cognitively |

				and video-based materials without the 1 to 1 follow-up with content and progression based on the health belief model.	Group, N= 424 Control Group, N= 381			intact patients. However, the program is time intensive (20 to 36 minutes per patient).
Hill et al. (2009)	To compare effectiveness of DVD education with written delivery of falls prevention education material on patients self-perceived risk of falls, perception of falls epidemiology, knowledge of falls prevention strategies, and confidence and motivation to	Two- Group RCT with quasi-experimental control group. Phase 1 and Phase 2 design. Control group analysis in Phase 1, Study group analysis in Phase 2. Measurement involved a	No hypothesis stated. Patients randomized to the two study groups. Study sites were two hospitals in different cities of Australia. Patient exclusion criteria clear. Investigators administering surveys were not blinded to the type education patient received.	Dependent Variables- Self perceived risk of falls, perception of falls epidemiology, knowledge of prevention strategies, and motivation and confidence to engage in self-protective strategies. Independent Variables- 1) DVD education 2) Workbook	Control group patients rec-ruited in first year of study (Phase 1) and two study group patients recruited during the following year (Phase 2). Geriatric, medical, and orthopedic acute wards	Parametric tests for group compare-isons. Wilcoxon rank sum tests for comparison between groups. Logistic regression analyses to compare responses between the DVD	There was a within group increase in self-perceived risk of falls in the DVD group after the education (P= .04) while the change within the workbook group was not significant (P=.18). A higher proportion of participants who received either from of education as compared to the control group, provided desired responses across all knowledge items (P<.001). Participants in the DVD study group had higher levels of confidence (P=.03), and motivation (P=.04), to engage in self-protective

	engage in self-protective strategies. To determine if providing either form of education versus no education has an effect on the perceptions of risks of falling and harm they face in hospitals.	custom-designed survey addressing elements of the Health Belief Model.	IRB approval obtained.	education.	in two hospitals in Australia. Participants older than 60, cognitively intact, and good eyesight and hearing. Control Group, N= 122 DVD Study Group, N= 49 Workbook Study Group, N= 51	group and the workbook group.	strategies than the workbook study group. There is some evidence that DVD educa-tion vs. workbook education influences patient's perceptions of fall risk and motivation to participate in fall prevention strategies.
Krauss et al. (2007)	To describe potential	Retrospective Cohort Study	Reviewed falls from 9 hospitals	Dependent Variable- 1) Mean	Falls from 9 hospitals	SAS and SPSS used	For the 3 year period the fall rate differed significantly by

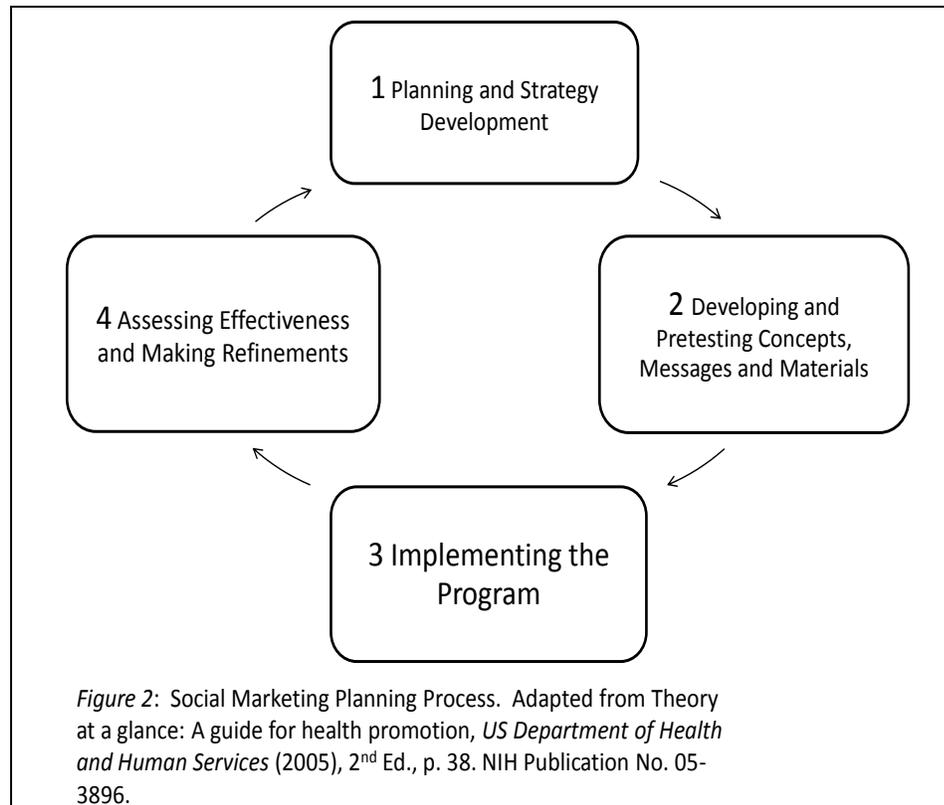|						
variation in fall rates and circumstances among different hospitals, identify risk factors associated with any type of fall, and identify risk factors associated with serious injury.		in the same hospital system during a 3 year period. Incident reporting system was the same for all 9 hospitals. Narrative data used only for coding toileting as activity during fall. Final models ran for random effect for hospital which did not change results.	fall rates per 100 beds 2) Falls with injury 3) Falls with serious injury Independent Variables- 1)Hospital characteristics 2) Patient characteristics 3) Circumstances of the fall (mental status, toileting, time of day, location)	within one system including academic/ nonacademic, small/large, and rural/urban. Falls during physical therapy excluded. N= 8,974 falls N= 7,082 patients	for analysis. Parametric and Nonparametric analysis completed.	hospital size (P<.001), by hospital location (P<.001) but not by hospital type (P=.473). Higher incidence of falls with serious injury were found in academic centers (P<.001) and higher incidence of assisted falls found in academic centers (P<.001) were the only differences by hospital type. 26.4% of falls resulted in some type injury and 2.4% of the falls resulted in serious injury. For academic hospitals increased age (aOR, 1.006; 95% CI, 1.000-1.012), falls outside patient rooms (aOR, 1.53; 95% CI, 1.03-2.27), and unassisted falls (aOR, 0.72; 95% CI, 0.58-0.89) were significant for increase injury risk. In nonacademic hospitals increased age (aOR, 1.007; 95% CI, 1.002-1.013), falls

							in bathroom (aOR, 1.46; 95% CI, 1.06-2.01), and unassisted falls (aOR, 1.83; 95% CI, 1.37-2.43) were associated with fall injury. Female sex (aOR, 0.83; 95% CI, 0.71-0.97) was associated with lower risk of injury. Older patients must be targeted for fall prevention while unassisted and when in the bathroom.
Wong et al. (2011)	1) To estimate the current cost and length of stay (LOS) that can be attributed to a fall with serious injury. 2) Evaluate the use of optimal bipartite matching (OBM) analysis	Retrospective Case-Control Study	Cases were randomly matched to two controls by hospital, age within five years, year of discharge, and diagnosis related group (DRG). Three hospitals were used to	Dependent Variable- Serious fall related injury. Serious injury defined as defined as fracture, subdural hema-toma, injury requiring surgical intervention, or death. Independent Variables- Cost and length of stay	Adult inpatients discharged from one of 3 hospitals, between January 2004 and October 2006, who fell and sustained a serious	Parametric testing to determine distribution of costs and LOS. Two methods of analysis were used, regression (univariate and multi-	Multivariate analysis indicated $13,316 more costs due to serious injury fall (p<.01; 95% CI, $1,395-$35,561) and that these fallers stayed 6.3 days longer than nonfallers (p<.001; 95% CI, 2.4-14.9). Univariate analysis indicated fallers with serious injury were more likely to have diabetes with organ damage, moderate to severe renal

techniques for this type analysis.		identify cases.	related to the serious falls injury. Costs determined through the hospital system cost accounting system and using the 2009 Medical Care component of the Consumer Price Index for All Urban Consumers from the US. Bureau of Labor Statistics. The Charlson Comorbidity Index was used to summarize the comorbidity cost burden.	injury. N=57	variate) and OBM to evaluate cost and LOS to be attributed to the serious fall. Analysis by SPSS and SAS.	disease, and a higher mean score on the Charlson Comorbidity Index. OBM analysis indicated Serious injury fallers cost an additional $13,806 more (p<.001; 95% CI, $5,808-$29,450) and stayed 6.9 days longer (p<.001; 95% CI, 2.8-14.9). Patients who fall and sustain a serious injury had higher costs and longer LOS in these three hospitals.

Appendix C:

Figure 2: Social Marketing Planning Process

Figure 2: Social Marketing Planning Process. Adapted from Theory at a glance: A guide for health promotion, *US Department of Health and Human Services* (2005), 2nd Ed., p. 38. NIH Publication No. 05-3896.

Appendix D:

Content Outline for Educational Video

Content Outline for Educational Video

Preventing Falls in an Acute Care Setting Through

Patient and Family Education

Capstone Study Project

I. Introduction
   a. Falls in the hospital do occur and can cause injuries, longer stay in the hospital, need for placement in nursing homes, and death (CDCP, 2005; Currie, 2008)
   b. Nationwide in U.S. hospitals within one year:
      i. *Of 37 million patients hospitalized per year in the US*, over one million patients may fall in hospitals (Currie, 2008)
      ii. 90,000 patients who fall have serious injuries such as cuts, broken bones, or head injuries (Currie, 2008)
      iii. About 11,000 of patients who have a serious injury from a fall die (Currie, 2008)
   c. The Center for Disease Control and Prevention reports that of older adults who fall: (CDCP,2005)
      i. One in five who break their hip from falling will die within one year
      ii. 46% of falls resulting in death were due to traumatic brain injury
   d. In the hospital falls are the most frequently occurring adverse event (Currie, 2008)
   e. Longer stays in the hospital can be from six to 12 days after a fall (Bates, Pruess, Souney, & Platt, 1995; Wong et al., 2011)
   f. Hospitals and patients working together to prevent falls have been able to reduce the numbers of falls (ICSI, 2010)
II. Risks for falling in the hospital
   a. All patients who are in the hospital are at risk for falling, but increased age has been shown to be a factor for increased risk (Currie, 2008; Hitcho, et al., 2004; Krauss et al., 2007)
   b. Illness requiring hospitalizations may result in:
      i. New medications, with new side effects that the patient is not accustomed to (Hitcho, et al., 2004)
         1. Dizziness
         2. Lowered blood pressure and pulse

3. Need to go to the bathroom more frequently
4. Confusion
   ii. Unexpected weakness and loss of balance when getting up to walk (Carroll, Dykes, & Hurley, 2010)

c. Unfamiliarity of the hospital (Hitcho et al., 2004; Tzeng & Yen, 2009)
   i. Bed may be at a different height than at home
   ii. A walker or cane not being near by
   iii. May have equipment with tubes in use
   iv. Needing to wait for a nurse to get up

d. As many as half of all falls in the hospital are reported to happen when patients are walking to and walking back from the bathroom (Hitcho, 2004; Tzeng, 2010)
   i. *While it may be embarrassing to have a toileting accident in your bed or chair, it is better to wait for the nurse to help you get to toilet than risk getting up by yourself , falling, and breaking a bone or worse, hitting your head causing a brain injury*

III. What do hospitals do to keep patients from falling (ICSI, 2010; Currie, 2008)

a. Hospitals have significantly reduced the number of patient falls by putting techniques and programs in place to prevent falls
b. Do special assessments to understand each patient's risk for falling
c. Communicate your risk to the entire care team
d. Use special equipment when needed
   i. Call bells for you to call for assistance before getting up alone
   ii. Special socks and footwear that prevent slipping
   iii. Bed and chair alarms that remind you not to get up alone and to let staff know that you are getting up and they need to come help you
   iv. In special cases the staff may use a bed that has a tent over it to keep patients from getting up without help
e. Check on you frequently to see if you need to go to the bathroom, or get up to the chair, or if you are having pain
f. Staff will stay in the bathroom with the patient if necessary
g. Keep your hospital room straightened up and keep the things you need close to you
h. Educate the patient and family to what they need to do to prevent falls

IV. What do patients need to do to not fall, they have choices

a. *Using strategies to prevent falling in the hospital is a choice you can make to prevent an injury due to a fall*
b. If you use a walker or cane at home, tell the nurse you need it in the hospital; use it even in your hospital room

c. Ring the call bell for the nurse, do not try to get up by yourself

d. Remember that while the nurses and other staff may appear to be busy, they are here to assist you and keep you safe. You are not a bother, but are the number one priority (Carroll et al., 2010)

e. Remember you are ill:

    i. You may be at risk for falling in the hospital regardless of your normal at home abilities for independence

    ii. You may be unaware how dizzy or weak you have become due to your illness (Carroll et al., 2010)

    iii. You do not know how the new medications will affect you (Hitcho et al., 2004)

    iv. While you may have tended all your life to be a risk taking person, during an illness requiring you to be in the hospital is not the time to take risks (Kloseck, Cirlly, & Gibson, 2008)

    v. *Staff are not trying to take away your dignity by having you use fall prevention measures, only trying to keep you safe while you are ill*

f. Use the non slip footwear staff have told you to wear

g. Know that if there are alarms put on your bed or chair it is for a reminder to you *to wait for a nurse* and for staff to come assist you

h. You may need to be patient for a staff member to come to help you, and often minutes seem much longer that they are. Please be patient and do not get up on your own

i. When staff offer to take you to the bathroom while they are in your room, let them

j. Tell staff and family to put your things near you before they leave the room and be sure your bed is in the lowest position as they may need reminders

k. Allow your family to remind you of ways you can prevent falling while a patient

V. What families can do to prevent patient falls (VonDras & Madey, 2004)

a. Provide messages to the patient that support fall prevention strategies

    i. Injuries and death can occur

    ii. Illness and new medications may make them dizzy and weak

    iii. Dangerous trying to go to bathroom alone; *it is OK to have an accident because you are sick. Nurses are here and trained to take care of this, and do so everyday*

    iv. Nurses will tell them what it is safe and not safe for them to do based on how at risk they are to fall

   v. Use the call bell which does not bother the staff and nurses, that is why they are there

   vi. Wear special footwear to not slip

   vii. Encourage patient not to take risks while so ill as to be in the hospital

   viii. Remind the patient that they can help prevent falling and getting injured by following the instructions of the nurse and staff

   ix. Do not get the patient up by yourself

   x. Do not leave the room cluttered when you step out

   xi. Put things the patient might need within reach

VI. Family Member Interview

  a. Describes their experience of losing a parent as result of a fall

  b. Encourages autonomy and dignity to prevent falling

Note: Red italicized type indicates changes related to patient feedback during pretesting of messages

Appendix E:

Content of Falls Education Brochure

Your safety is our priority!

Each year across the nation, thousands of patients fall during their hospital stay. Many of those falls cause a patient injury. Falls can increase a patient's hospital stay by 6 to 12 days and may lead to a nursing home or rehab placement.

Your healthcare team has learned that simple changes and teamwork between patient, family, and staff can result in a safe, positive experience.

Why are hospitalized patients at a higher risk for falls?

- Experiencing side effects of new medications
- Weakness from illness, lack of sleep and hospitalization
- Environmental risks, such as oxygen tubing and IV poles
- Adjustments to new medical condition
- Recovering from recent surgery or other procedures

If you have any of these risk factors for falls, your nurse may:

1. Use alarms that tell staff you have forgotten to use your call bell and are getting out of bed
2. Assist you to and from the bathroom
3. Remain with you while you're using the bathroom

To help prevent a fall, RMH will:

- Maintain a safe and clutter-free environment
- Provide slip resistant footwear
- Respond quickly to call bells and bed alarms
- Supply walkers or other assistive devices
- Check on you frequently and assist you to the bathroom
- Ensure the bed is in a low position with side rails up
- Offer help with tubes and equipment

If you're considered to be someone who's at high risk of falling, you will wear a special armband and we'll place a sign on your room door. This alerts staff to your risk of falling.*

You can help prevent a fall by:

- Understanding that when you are sick, you might not be as strong or self-supporting as when you're well.
- Ringing the call bell for any needs.
- Asking for help. We are never too busy to assist you!
- Reminding us if you cannot reach what you need
- Telling your nurse or doctor if you are experiencing any dizziness, weakness or drowsiness
- Changing positions slowly
- Using adequate lighting
- Being aware that most falls occur while patients are walking to the bathroom. Remember to use your call bell!
- Educating us about devices you use at home

Your family can help prevent falls by:

- Asking staff before assisting you out of bed
- Encouraging you to ask for help.
- Reassuring you that you're not bothering the staff by using the call bell
- Communicating with staff any safety concerns you may have
- Notifying staff if you are leaving the room, so we can provide safety measures
- Making sure call bell and personal belongings are within easy reach

*In very high-risk situations, a special enclosed bed may be recommended to prevent the patient from getting out of bed.

Appendix F:

Post Fall Huddle Report

Post-Fall Huddle Form

(Label)

Section A: Fall Event Details (to be filled out by RN)

Date of Fall: Time of Fall: Pre-Fall Estimated Discharge Date:

Department/Nursing Unit where fall occurred:

Had the patient been identified as a fall risk: ☐ Yes   ☐ No

When was the last time the patient was rounded on?

Which of the following were assessed during rounds?   ☐ Pain   ☐ Potty   ☐ Positioning   ☐ Placement of

Section B: Post-Fall Huddle SBAR (within 15-30 minutes of a fall, gather all members of the team (including pat and housekeeper) available on the shift and day the fall occurred to complete the following questions):

SITUATION

Did fall occur during change of shift: ☐ Yes   ☐ N

Where did the fall occur: ☐ Patient room   ☐ Patient bathroom   ☐ Hallway   ☐ Other:

Environmental Assessment Completed?   ☐ Yes   ☐ No   **Hazardous Footwear?** ☐ Yes   ☐ No

Trip Hazards?   ☐ None   ☐ Clothing   ☐ Shoes (ill-fitting/untied laces)   ☐ Tubing/Cord
☐ Obstructed path to bathroom   ☐ Other:

Evidence of slippery floor?   ☐ Yes   ☐ No

Was lighting in the room adequate?   ☐ Yes   ☐ No

Was there equipment malfunction?   ☐ No   ☐ Call bell   ☐ Bedrails   ☐ Other:

What do you think the patient was doing at the time of the fall?   ☐ Getting up on their own
☐ Trying to get to the bathroom   ☐ Reaching for something   ☐ Leaning on something
☐ Trying to get elsewhere (_____)   ☐ Other: _____

BACKGROUND

Fall risk factors (check all that apply)

☐ **Impaired mobility**

☐ **Impaired mentation**

☐ **Impaired/altered elimination patterns (nocturia, urgency, frequency, diarrhea, incontinence, laxative, bowel p**

☐ **Impaired communication/sensory (vision, hearing, neuopathy)**

☐ **Impaired vital signs (fever, slow or fast heart rate, low blood pressure)**

☐ **Prior fall history (at home, previous facility, during this stay)**

☐ **Medications administered within 8 hours prior to fall:**

☐ None	☐ PCA	☐ Opiates	☐ Anticonvulsants	☐ Antihyperten
☐ Antiarrhythmics	☐ Diuretics	☐ Hypnotics	☐ Sedatives	☐ Laxatives
☐ Antidepressants	☐ Benzos	☐ Antipsychotics	☐ Antihistamines	☐ Antiparkinson
☐ Alzheimer drugs	**Is the patient on anticoagulants?**	☐ Yes	☐ No	
☐ Diagnosis-related	☐ Hypotension ☐ Hypoglycemia	☐ Neurological Disorder	☐ Cardiac	☐ C

What did the patient/family report was the reason for the fall?

ASSESSMENT

Injury: ☐ None   ☐ Minor: ☐ Moderate: ☐ Severe:

RECOMMENDATION

What can we do to prevent this from happening again? Care plan recommendations:

☐ Hourly Rounding	☐ Remove equipment from path to BR	☐ Improve W/C positioning
☐ Remove clutter from room	☐ Oxygen tubing management	☐ Move closer to nurses station
☐ Toileting plan	☐ Non-slip footwear	☐ Identify items patients want nea
☐ Alarm	☐ Patient education re: risk/strategies	☐ Fall awareness signage
☐ PT Eval	☐ Family education re: risk/strategies	
☐ OT Eval	☐ Pharmacy review of meds	

Post-Fall Checklist

☐ Perform post-fall monitoring, including neuro checks, if evidence/suspicion of head injury

☐ Revise plan of care to include prevention strategies based on huddle findings

☐ Communicate fall and increased risk to physician, next shift, other health care team members, family, if approp

Appendix G:

Informed Consent for Intervention Group

Informed Consent for Study Inclusion Form

Intervention Group

Study Name: Preventing Falls in an Acute Care Setting Through Patient and Family Education

Dear Patient:

Patients in the hospital are at risk of falling, and some who fall experience serious injuries. There have been studies that tell us that certain factors such as age, new medications, dizziness, and weakness due to illness put patients at particular risk to fall while in the hospital.

At times Rockingham Memorial Hospital (RMH) makes changes in the ways care is provided and monitors these changes to decide if they improve the quality and safety of patients. The research we are asking you to take part in is to reduce the risk of falling for patients in the hospital by patients and family members watching a video on preventing falls. Any patient admitted to RMH receives fall prevention efforts, including education on how patients can reduce their own risk of falling. You will be part of a group of patients during a three month period who receives the usual efforts by staff to prevent falls which includes a falls education brochure. In addition to the brochure usual efforts include such things as unit orientation and a fall risk assessment tool. Usual care efforts will include interventions based on the patients individual fall risk score and may include yellow slip resistant socks, yellow arm bands, and bed alarms. However for this part of the study we are asking you and one of your family members, if available, to also watch a video on falls prevention education. Another group of patients during a previous three month period received the same care as you but neither those patients nor their families viewed the video education.

Patient Initials_____Date_____

Family or Friend Initials_____Date_____

We will be monitoring the number of patient falls, and the injuries that occur from those falls, for those who participate in the study. We are trying to determine if education provided to patients and family members decrease the number of patient falls and patient injuries related to falls.

The purpose is to try different ways of education to decrease your risk of falling while a patient in the hospital. After you and your family member (if they are available) watch the video, a nurse will ask you one thing that you can do to prevent falling while a patient.

There are no known risks to patients or family members who accept being involved in this study. Any reports or publications related to this study will not identify any personal information about you or your family.

We would like your permission to have you participate in this study while you are a patient on the study unit. We believe you may benefit from participation in this study by a decreasing your risk of falling, experiencing an injury due to falling, and increasing your knowledge of your own risk for falling. If you are willing to be part of this study please read all this information, complete the required blanks, and sign indicating your permission on the bottom of this consent form.

Name of
Patient_____

I state that I am at least 18 years of age and wish to participate in this study being conducted by RMH.

Patient Initials_____Date:_____

Name of

Family or Friend_____

I state that I am at least 18 years of age and wish to participate in this study being conducted by RMH.

Family or Friend Initials_____Date_____

All the information collected in this study is confidential. I understand that the data I provide may be grouped with other patient data for reporting and presenting and that my name or other specific private information will not be used.

I understand that I am free to ask questions or withdraw from participation at any time and without penalty.

RMH does not provide any medical or hospitalization insurance or compensation for being involved in this study and RMH does not agree to assume any responsibility for falls which occur during this study participation.

If you have any questions about your rights as a research study participant or wish to report a research related injury, contact:

Stewart Pollock, MD, Chairman of the IRB at Rockingham Memorial Hospital 2010 Health Campus Drive, Harrisonburg, VA, 22801.

Dr. Pollock's phone number is 540-689-1000.

If you have questions about this particular study, contact:

Donna S. Hahn, MSN, RN, NEA-BC, Vice President/Chief Nurse Executive, 2010 Heath Campus Drive, Harrisonburg, VA, 22801.

Ms. Hahn's phone number is 540-689-1200.

Subject Name:

_____

Subject Signature:

_____

Date Signed:

_____

                                    Patient Initials_____Date_____

                                    Family or Friend Initials_____Date_____

If Applicable:

Family or Friend Name:_____

Family or Friend Signature:_____

Date Signed:_____

Witnessed
By:_____Date:_____

                                    Patient Initials_____Date_____

                                    Family or Friend Initials_____Date_____

Appendix H:

Informed Consent for Comparison Group

Informed Consent for Study Inclusion Form

Comparison Group

Study Name: Preventing Falls in an Acute Care Setting Through Patient and Family Education

Dear Patient:

Patients in the hospital are at risk of falling, and some who fall experience serious injuries. There have been studies that tell us that certain factors such as age, new medications, managing tubes and equipment, and weakness due to illness put patients at particular risk to fall while in the hospital.

At times Rockingham Memorial Hospital (RMH) makes changes in the ways care is provided and monitors these changes to decide if they improve the quality and safety of patients. The research we are asking you to take part in is to reduce the risk of falling for patients in the hospital by comparing the way you are educated on prevention of falls while a patient. Any patient admitted to RMH receives fall prevention efforts, including education on how patients can reduce their own risk of falling. However, on the unit you are admitted to we are researching how the educational brochure you receive compares to a video education tool that another group of patients and family members will receive to reduce the risk of patient falls.

You will be part of a group of patients during a three month period who receives the usual efforts by staff to prevent falls which includes a falls education brochure. In addition to the brochure usual efforts include such things as unit orientation and a fall risk assessment tool. Usual care efforts will include interventions based on the patients individual fall risk score and may include yellow slip resistant socks, yellow arm bands, and bed alarms.

Initials_____Date_____

Another group of patients during a different three month period will receive the same care as you but will be asked, along with family, to view a falls prevention video.

We will be monitoring patient falls who participate in the study to determine if the video decreases the number of patient falls and patient injuries related to falls. The purpose is to try different ways of education, compare them, and to then in the future use the method that works best to reduce patient falls.

There are no known risks to patients or family members who accept being involved in this study. Any reports or publications related to this study will not identify personal information.

We would like your permission to have you participate in this study while you are a patient on the study unit. We believe you may benefit from participation in this study by a decreasing your risk of falling, experiencing an injury due to falling, and increasing your knowledge of your own risk for falling. If you are willing to be part of this study please read all this information, complete the required blanks, and sign indicating your permission on the bottom of this consent form.

Name of
Patient_____

I state that I am at least 18 years of age and wish to participate in this study being conducted by RMH.

Patient Initials_____Date:_____

All the information collected in this study is confidential. I understand that the data I provide may be grouped with other patient data for reporting and presenting and that my name or other specific private information will not be used.

Patient Initials_____Date:_____

I understand that I am free to ask questions or withdraw from participation at any time and without penalty.

RMH does not provide any medical or hospitalization insurance or compensation for being involved in this study and RMH does not agree to assume any responsibility for falls which occur during this study participation.

If you have any questions about your rights as a research study participant or wish to report a research related injury, contact:

Stewart Pollock, MD, Chairman of the IRB at Rockingham Memorial Hospital 2010 Health Campus Drive, Harrisonburg, VA, 22801.

Dr. Pollock's phone number is 540-689-1000.

If you have questions about this particular study, contact:

Donna S. Hahn, MSN, RN, NEA-BC, Vice President/Chief Nurse Executive, 2010 Heath Campus Drive, Harrisonburg, VA, 22801.

Ms. Hahn's phone number is 540-689-1200.

Subject Name:

_____

Subject Signature:

_____

Date Signed:

_____

Witnessed
By:_____Date:_____

Appendix I:

Investigational Review Board Approval

UNIVERSITY VIRGINIA IRB-HSR   **Institutional Review Board for Health Sciences Research**

DETERMINATION OF UVa AGENT FORM

INFORMATION ABOUT THIS FORM
- This form is to determine if UVa personnel are or are not considered to be working as an Agent* for UVa on this project.
- If it is determined that UVa personnel are considered to be working as an Agent* for UVa the study team will be required to submit an additional submission to the IRB-HSR, unless the project is determined to not involve human subject research. See Determination of Human Subject Research Form

Agent- all individuals (including students) performing institutionally designated activities or exercising institutionally delegated authority or responsibility.

Enter responses electronically. Prior to obtaining signatures, email the completed form to IRBHSR@virginia.edu for pre-review. An IRB staff member will reply with any changes to be made.

Name of Individual to be Working on Project: Donna S. Hahn

Email: dsh6xt@virginia.edu

Phone: 540-689-1200

UVa Messenger Mail Box #

Project/Protocol Title if Known: ☐ Unknown or
Title: Preventing Falls in an Acute Care Setting Through Patient and Family Education

Explain your role in the project: (200 words or less)   I am a Doctor of Nursing Practice student at UVa and this study serves as my Capstone Project. I will be the primary investigator of the study.

Explain the reason for traveling to the outside institution.   My role at Rockingham Memorial Hospital is Vice President Acute Care/Chief Nurse Executive. The study will serve to increase knowledge for decreasing patient falls, which is within my responsibilities for patient care.

1. Answer the following questions:
☒Yes ☐No I was involved in the design of this research project.
☐Yes ☒No A UVa IRB has approved this research. IRB-HSR #
☐Yes ☒No Funding to conduct this research will come from UVa.
☐Yes ☒No The only reason I am traveling to this outside institution is to work on this research.
☒Yes ☐No Working on this research is required for my degree program.

2. I confirm that
☐Yes ☐No I am a student, employee and/or faculty member of the University of Virginia.
☐Yes ☐No The project has or will have IRB approval from the outside institution and I will be listed on their application as personnel conducting the study.
☐Yes ☐No My work on this project will be overseen by the Principal Investigator and the IRB at the outside institution.

OR
3. I confirm that

Version date: 02-18-12
Page 1 of 2

☒Yes ☐No   I designed this research, I am a student at UVa but am employed by another
institution. All subjects will be enrolled at this outside institution, and the research
will be overseen by their IRB. There is no funding for this study.
ATTACH COPY OF OUTSIDE IRB APPROVAL.

Donna S. Hahn _____   _7/25/12_____
Printed Name of Person Completing this Form   Date

Donna S. Hahn _____   _7/25/12_____
Signature of Person Completing this Form   Date

FOR IRB-HSR OFFICE USE ONLY

☒ UVa personnel are not considered to be working as an Agent for UVa on this project.
No approvals from the UVa IRB-HSR are required.

☐ UVa personnel are considered to be working as an Agent for UVa on this project.
Submit a research application to the UVa IRB-HSR.

Susie Hoffman, IRB-HSR Director   _7/26/12_
Signature of IRB Chair, Director or Designee   Date

RMH
HEALTHCARE

July 10, 2012

Ms. Donna Hahn
Rockingham Memorial Hospital
2010 Health Campus Drive
Harrisonburg VA 22801

Donna,

RE: **Preventing Falls in an Acute Care Setting Through Patient & Family Education**

At the convened meeting of the Rockingham Memorial Hospital Institutional Review Board on
July 10, 2012, the above referenced protocol dated 6/13/12 and the informed consent, RMH
Version 1 dated 6/13/12 were unanimously approved by the full board (10 votes for, 0 against, 0
abstentions) with the following modifications:

- Define "usual care" in the protocol and consent form.
- Add that the intervention group also gets "usual care".
- Once the video has been completed (late August), a subgroup of the IRB needs to review it.

The study will expire on July 10, 2013. At that time, the annual protocol will be reviewed for
continuing approval. Any serious adverse events will require reporting per the Rockingham
Memorial Hospital IRB Guidelines.

Sincerely,

Stewart Pollock, MD
Chairman
RMH Healthcare
Institutional Review Board

RMH
HEALTHCARE

October 8, 2013

Ms. Donna Hahn
Rockingham Memorial Hospital
2010 Health Campus Drive
Harrisonburg VA 22801

Donna,

RE: Preventing Falls in an Acute Care Setting Through Patient & Family Education

At the convened meeting of the Rockingham Memorial Hospital Institutional Review Board on
November 13, 2012, an amendment dated 11/9/12 to the above referenced protocol asked for the
addition of other specifically trained Patient Care Technicians to obtain informed consent for the
study. This amendment was approved by the full board (7 votes for, 0 against, 0 abstentions).
Dr. Hahn was excused and left the room before the voting

Donna Hahn, RN contacted Kristin Payne, RMH IRB, on October 8, 2013 requesting a copy of
the amendment approval letter. It was discovered that an approval letter had not been submitted
to Ms. Hahn for her records.

The study was closed to accrual, follow-up only on July 9, 2013. Until follow-up is concluded,
the study will be renewed on or before July 10 of each year. Any serious adverse events will
require reporting per the Rockingham Memorial Hospital IRB Guidelines.

Sincerely,

Stewart Pollock, MD
Chairman
RMH Healthcare
Institutional Review Board

Appendix J:

Author Guidelines

Journal of Nursing Care Quality

Journal of Nursing Care Quality
Online Submission and Review System

Instructions for Authors (this page)
Copyright Transfer (PDF)
Reprint Ordering
Permissions Requests
Permission Form (PDF)
Permission to Acknowledge form

Journal of Nursing Care Quality Online Submission and Review System

Editorial Purpose

The primary objective of the *Journal of Nursing Care Quality (JNCQ)* is to provide practicing nurses and nurses in leadership roles with useful information about patient safety, quality care, and the application of quality principles in the clinical setting. Articles in the *JNCQ* address patient safety, innovative and effective approaches to improving quality and safety in healthcare, research on quality care, and evidence-based practice in nursing. The *JNCQ* provides a forum for the discussion of patient safety issues and "real world" implementation of quality-related activities.

Manuscript Review

The *JNCQ* is a peer-reviewed journal. Published manuscripts have been reviewed, selected, and developed with the guidance of the editorial board. Manuscript content is assessed for relevance, accuracy, and usefulness to practicing nurses, nurses in leadership roles, and other healthcare providers involved in evaluating and improving safety and quality of care. Manuscripts are reviewed with the understanding that neither the manuscript nor its essential content has been published or is under consideration by others.

Authorship Responsibility

All persons designated as authors should qualify for authorship. Each author should have contributed significantly to the conception and design of the work and writing the manuscript to take public responsibility for it. The editor may request justification of assignment of authorship. Names of those who contributed general support or technical help may be listed in an acknowledgment placed after the narrative and before the references.

Query Letters

Although not necessary, query letters allow the editor to indicate interest in, and developmental advice on, manuscript topics.

Manuscript Preparation

Prepare manuscripts according to the *American Medical Association (AMA) Manual of Style* (10th ed) 10th edition. The maximum manuscript length is approximately 18 pages including tables, figures, and references. As a general rule, an 18-page paper should have no more than 3 figures or tables.

For manuscripts describing quality improvement studies, follow the Standards for Quality Improvement Reporting Excellence (SQUIRE) guidelines at http://www.squire-statement.org/guidelines. (see also Oermann MH. SQUIRE guidelines for reporting improvement studies in healthcare: Implications for nursing publications. *J Nurs Care Qual*.2009; 24(2):91-95 For some manuscripts, it may not be appropriate to include every guideline item, but authors should consider each item in preparing their papers for submission. The "Discussion" section should include nursing implications.

Format

Double space the manuscript using a 12-point type size, any font style.
Add page numbers in the upper right-hand corner of each page.
Left justify all text, including headings.
Divide the text into main sections by inserting subheadings.
All headings are flush left, in bold, and distinguished by level as follows:
    FIRST-LEVEL HEADING (CAPITALIZED ON SEPARATE LINE)
    Second-level heading (Regular on separate line)
    Third-level heading (Italic on separate line)
Do not use running headers or footers.

Title/Author Biography Page

Information for the title/author biography page is placed in a 1-page Word file. This information should not be placed in any other file. This title page Word file should contain only the:

Title of the manuscript;

1. Author(s) names and credentials (highest earned credential only, followed by RN, and certifications);

2. Author(s) affiliation(s): job title, department, institution, city, state, country;

3. Corresponding author: For publication, it is preferable to use a work address. You must include an e-mail address at the end of your mailing address; and

4. Funding information and other disclaimer or disclosure information. Include disclosure of funding received for this work from any of the following organizations: National Institutes of Health (NIH); Wellcome Trust; Howard Hughes Medical Institute (HHMI); and other(s).

Abstract

Include an abstract of 50 to 75 words that stimulates readers' interest in the topic and states what they will learn from reading the article.

Tables and Figures

Tables and figures, if any, should be saved as individual files. All tables must be numbered consecutively with Arabic numbers and have a title. All figures must be numbered consecutively with Arabic numbers and have a title. Tables and figures must be cited in numerical order in the text. All figures and other artwork should be submitted in black and white.

A) Creating Digital Artwork

1. Learn about the publication requirements for Digital Artwork:

   http://links.lww.com.proxy.its.virginia.edu/ES/A42

2. Create, Scan and Save your artwork and compare your final figure to the Digital Artwork Guideline Checklist (below).

3. Upload each figure to Editorial Manager in conjunction with your manuscript text and tables.

B) Digital Artwork Guideline Checklist
Here are the basics to have in place before submitting your digital artwork:

- Artwork should be saved as TIFF, EPS, or MS Office (DOC, PPT, XLS) files. High resolution PDF files are also acceptable.

- Crop out any white or black space surrounding the image.

- Diagrams, drawings, graphs, and other line art must be vector or saved at a resolution of at least 1200 dpi. If created in an MS Office program, send the native (DOC, PPT, XLS) file.

- Photographs, radiographs and other halftone images must be saved at a resolution of at least 300 dpi.

- Photographs and radiographs with text must be saved as postscript or at a resolution of at least 600 dpi.

- Each figure must be saved and submitted as a separate file. Figures should not be embedded in the manuscript text file.

Remember:

- Cite figures consecutively in your manuscript.

- Number figures in the figure legend in the order in which they are discussed.

- Upload figures consecutively to the Editorial Manager web site and enter figure numbers consecutively in the Description field when uploading the files.

References

Prepare references according to the style used in the *AMA Manual of Style* (10th ed.). References should be typed double-spaced and placed at the end of the manuscript. They should be numbered consecutively in the order in which they are cited in the text. Whenever a reference is repeated in the text, it uses the same reference number each time. Journal titles should be abbreviated according to the listing in the PubMed Journals database. If not listed there, journal titles should be spelled out.

Examples:
Journal article with 1 author:
Clancy CM. The promise and future of comparative effectiveness research. *J Nurs Care Qual*. 2010;25(1):1-4.

Journal article with multiple authors:
Levin RF, Keefer JM, Marren J, Vetter MJ, Lauder B, Sobolewski S. Evidence-based practice improvement: merging 2 paradigms. *J Nurs Care Qual*.2010;25(2):117-126.

Book:
Oermann MH, Hays JC. *Writing for Publication in Nursing*. 2nd ed. New York: Springer;2011.

Web site:
2010 National Patient Safety Goals (NPSGs). The Joint Commission Web site. http://www.jointcommission.org/patientsafety/nationalpatientsafetygoals/. Published June 2006. Accessed May 1, 2010.

For other electronic references, follow guidelines in the *AMA Manual of Style* p. 63.

Permissions

Written permission must be obtained from (1) the holder of copyrighted material used in the manuscript, (2) persons mentioned in the text or acknowledgment, and (3) the administrators of institutions mentioned in the text or acknowledgment. Where permission has been granted, the author should follow any special wording stipulated by the grantor. Letters of permission must be submitted before publication of the manuscript. Permission forms are available under Files and Resources.

Compliance with NIH and Other Research Funding Agency Accessibility Requirements

A number of research funding agencies now require or request authors to submit the postprint (the article after peer review and acceptance but not the final published article) to a repository that is accessible online by all without charge. As a service to our authors, LWW will identify to the National Library of Medicine articles that require deposit and will transmit the postprint of an article based on research funded in whole or in part by the National Institutes of Health, Wellcome Trust, Howard Hughes Medical Institute, or other funding agencies to PubMed Central. The revised Copyright Transfer Agreement provides the mechanism.

Conflicts of Interest

Authors must state all possible conflicts of interest in the manuscript, including financial, consultant, institutional and other relationships that might lead to bias or a conflict of interest. If there is no conflict of interest, this should also be explicitly stated as none declared. All sources of funding should be acknowledged in the manuscript. All relevant conflicts of interest and sources of funding should be included on the title page of the manuscript with the heading "Conflicts of Interest and Source of Funding:". For example:

Conflicts of Interest and Source of Funding: A has received honoraria from Company Z. B is currently receiving a grant (#12345) from Organization Y, and is on the speaker's bureau for Organization X – the CME organizers for Company A. For the remaining authors none were declared.

In addition, each author must complete and submit the journal's copyright transfer agreement, which includes a section on the disclosure of potential conflicts of interest based on the recommendations of the International Committee of Medical Journal Editors, "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (www.icmje.org/update.html). The form is readily available on the manuscript submission page http://www.editorialmanager.com/jncq/ and can be completed and submitted electronically. Please note that authors may sign the copyright transfer agreement form electronically. For additional information about electronically signing this form, go to http://links.lww.com.proxy.its.virginia.edu/ZUAT/A106.

Online Manuscript Submission

All manuscripts must be submitted online through our Web-based Editorial Manager system at
http://jncq.edmgr.com. Submit your manuscript according to the author instructions. You will be able to track the progress of your manuscript through the system.

First-time users: Click the Register button from the menu (on the upper banner) and enter the requested information. On successful registration, you will be sent an e-mail indicating your user name and password. Save a copy of this information for future reference.

Return users: If you have received an e-mail from us with an assigned user ID and a password, or if you are a repeat user, do not register again. Just log in. Once you have an assigned ID and a password, you do not have to re-register even if your status changes (ie, author or reviewer).

After registering as an author, log on to http://jncq.edmgr.com and select "Submit a New Manuscript." You will then:

1. Select an "article type" from the drop down menu

2. Enter the title of your manuscript

3. Add information about the author(s) of the paper

4. Enter abstract of your manuscript

5. Enter a few key words that describe your manuscript's content

6. Enter your comments to the editor in a dialogue box, mentioning any prior query you may have had with the editor

7. Attach your various individual files containing elements of your entire manuscript. No file should contain information found in any other file:

> Title/author biography page
>
> Abstract
>
> Manuscript text, ending with the references
>
> As many individual files as necessary, each containing 1 table or figure.

When all files are attached, the system will prompt you to complete a process that will submit your manuscript to the editorial office. You will receive an e-mail to let you know that the journal office received your manuscript. After the review process, you will receive an e-mail letting you know the final disposition of the manuscript. You may check the status of your manuscript at any time by logging in to http://jncq.edmgr.com. Select "Submissions Being Processed."

Revised Submission

If your manuscript is accepted for publication, the revision is submitted online at http://jncq.edmgr.com. **Do NOT submit your revision as a "New Submission" under the heading "New Submissions."** Log in using the same user name and password. On the Author Main Menu, under the heading **"Revisions,"** select the "Submissions Needing Revision" link, which will be the only active link.

Help

If at any time during this process you have questions, please e-mail moermann@msn.com

or marilyn.oermann@duke.edu, phone 248-568-1848   248-568-1848 FREE . The Editorial Office mailing address is *Journal of Nursing Care Quality*, Marilyn H. Oermann (Editor), 148 Saxapahaw Run, Chapel Hill, North Carolina 27516, USA.

Appendix J:

Table 1: Group Demographics and Length of Stay Characteristics

Table 1: Group Demographic and Length of Stay Characteristics

Variable	Group 1 Phase 1 Falls Brochure (*n*=100)	Group 2 Phase 2 Falls Brochure and Video (*n*=92)	*P*
Gender, *n* (%)			>0.05
Male	36 (36)	36 (39.1)	
Female	64 (64)	56 (60.9)	
Primary Language, *n* (%)			>0.05
English	100 (100)	91 (98.9)	
Spanish	0 (0)	1 (1.1)	
Race, *n* (%)			>0.05
African American	3 (3)	3 (3.3)	
Caucasian	96 (96)	84 (91.3)	
Hispanic	1 (1)	1 (1.1)	
Other	0 (0)	4 (4.3)	
Age, Mean (SD)	74.05 (7.933)	74.16 (8.499)	>0.05
LOS, Mean (SD)	3.33 (3.77)	3.77 (3.762)	>0.05

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Appendix L:

Draft Manuscript

Draft Manuscript:

Evidence Based Video Falls Education with Teach-Back

Shows Potential for Reducing Patient Falls

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ABSTRACT

Prevention of falls in the acute care setting is of importance to nursing leaders from patient quality and financial perspectives. This study sought to reduce falls and falls with injury for older, cognitively intact patients through patient and family education by way of an evidence and theory based video with teach-back. Clinical significance was determined as participants fell less frequently in the group receiving the falls education video with teach-back.

INTRODUCTION AND PURPOSE

Falls are reported to be the most frequently occurring adverse event for adult patients in hospitals.[1] Treatments related to hospital acquired conditions, and therefore injuries due to falls in acute care, are no longer reimbursed by the Center for Medicare and Medicaid Services.[2] The costs to hospitals can be significant as researchers have shown increased lengths of hospital stay after a fall with injury to cause an additional 6.3 to 12 days, and an increased mean cost up to $13,316 as a result of serious fall injuries.[3,4] Falls in the hospital setting are of concern to nursing and are endorsed by the National Quality Forum as a nurse sensitive indicator.[5] The Magnet Nursing Designation awarded by the American Nurse Credentialing Center has become a coveted credential by many healthcare organizations and standards of Magnet require that hospital personnel monitor fall rates and compare the hospital's performance to national benchmarks; the expectation is that Magnet hospitals sustain results to outperform the mean.[6,7]

Evidence based protocols and the literature support multifaceted fall prevention interventions, one of which is falls prevention education to patients and their families.[8-11] A gap was found in the availability of evidence based falls prevention education for the hospitalized adult patient and no clear identified role for the family; however, there is some evidence that a multimedia delivery of education may improve knowledge and outcomes.[9,10] The data and literature on falls is predominately focused on the older adult and expertise from health promotion literature encourages a clear target population when designing messages to change health behaviors.[12-14]

The purpose of this study was to develop an evidence based education video on falls prevention for the hospitalized older patient, to include this education to a family member or support person, perform teach-back with the patient, and to compare the difference in fall rates between a comparison group and intervention group. It was anticipated that fall rates in those patients who have viewed the video with family would be lower than patients who have not viewed the video and only received information about fall prevention through a brochure.

THEORETICAL FRAMEWORK

In developing a program of education for older adults and their family member, the theory of planned behavior (TPB) was aligned with social support theory.[12,15-17]

LITERATURE REVIEW

Factors related to risk of falling when hospitalized

Studies suggest multiple risk factors are related to falls in a hospital. Increased age,[1,18,19] administration of central nervous system and vasoactive medications,[1,18] and patients

toileting without assistance[19-21] are reported as risk factors for falls in the acute care setting. Patients were unaware of how quickly they became unbalanced and weak during hospitalization and verbalized that they were reluctant to bother the busy nursing staff to assist them in toileting.[21] A lifelong personality trait for risk taking, inattentiveness, and impaired mobility were associated risk for older adult falls in the hospital.[22,23] Environmental risk factors included a higher percentage of falls occurring in the evening hours, lack of access to ambulatory assistive devices, absence of clear pathways in the hospital room, failing to keep the bed height in the low position, failure to apply brakes on the bed, lack of proper footwear, good lighting, and prompt call bell responses by nursing personnel.[18,24,25]

Insights from patients and caregivers on fall prevention

Participants criticized beds being left in high position, insufficient fall prevention education, lack of ambulatory devices, cluttered rooms, need for increased monitoring, timely answering of call bells, and lack of physical therapy as problems associated with their recent hospitalization.[24] Nurses identified cognitive impairment, Alzheimer's, disorientation, patient inability to follow safety instruction, and imbalance/gait problems as the most frequently observed risk factors for patient falls.[25] A well designed education program with visual cues that engaged the patient and more frequent repetition of fall prevention messages from nurses were recommended improvements. Older adults agreed to the value of falls education; however, they may not heed all of the advice and that some of these older adults believed the messages were for the disabled and not for them.[26]

Research on patient and family fall prevention education

Two Australian studies were found, based on the Health Belief Model to design patient education. These two studies provided some evidence for the use of multimedia patient education as compared to written education material for cognitively intact older adults.[9,10] In a three group randomized controlled trial, Haines and colleagues[9] found participants in the treatment group who received multimedia and written education with a one on one follow-up by a health professional experienced fewer falls. The time spent individually with a patient for one to one follow up ranged from 20 to 36 minutes per patient.

 The second study used a randomized two group design, with a quasi-experimental control group, and compared the effect of falls prevention education delivered by DVD format or written format to no education.[10] While both written and DVD methods of education created higher numbers of desired responses to the survey compared to the control group, the DVD method of education delivery was found to produce statistically higher levels of confidence, motivation, and engagement in self-protective strategies using a custom designed survey.

METHODS

The study utilized a quasi-experimental design with a Phase 1 comparison group and Phase 2 intervention group. Both Phase 1 and Phase 2 groups received usual care for all patients as defined by the study unit protocols on fall prevention which included unit orientation, a falls education brochure, and a fall risk assessment completed on every patient every twelve hours to determine each patient's risk for falling. Patients then received fall prevention interventions based on their fall risk score of high, medium, or

low. Consent was obtained for all participants including patients in Phase 1 and patients

and family members in Phase 2. A daily electronic report of all patients currently on the

study unit was developed and included the patient name, room location, age, and current

status of consent. Falls and falls with injury were captured for the consented participants

and compared between the two groups.

The intervention group was shown an evidence based falls prevention education video,

with education messages for patient and family, via the television system in the patient's

hospital room. The intervention group also received the fall prevention brochure as part

of usual care. The video was activated following consent of the patient and also the

family when available. After viewing the video a Registered Nurse used a recommended

practice of teach-back with the patient and documented the participants viewing the video

and the teach-back.[27,28] Phase 1 participants received usual care which included a falls

education brochure. Unit Registered Nurses were to provide the falls brochure on

admission to all patients for review by the patient and document in the patient's

electronic medical record that the brochure was given to the patient. The falls brochure

was developed based on the same review of the literature as utilized for the treatment

video. Phase 1 study period was October through December of 2012 and Phase 2 study

period was from February through April of 2013.

The study received approvals from the study organization site's institutional review board

and the University of Virginia institutional review board.

Setting and sample

The study was conducted on a 36 bed nontelemetry medical unit within a 238 bed rural

designated sole community hospital located in the Mid-Atlantic region of the United

States and was part of an 11 hospital system. The unit was chosen to study fall reduction

strategies as it had the most opportunity for reduction at that time with a 5.93 total fall

rate and 1.50 falls with injury rate for the year 2011. Participant inclusion criteria were

patients admitted or transferred to the study unit, age 60 and over, patients with or

without family support, English or Spanish speaking, patients and family who had

consented to participate, and absence of diagnosis related to dementia, confusion,

Alzheimer's, or other cognitive disability.

Variables

A fall was defined as any unplanned descent to the floor. A fall with injury was defined

as any minor, moderate, or major injury including death.[8,13] Rates were calculated per

1000 patient days. The organization captures falls through electronic reporting

surveillance of nurse documentation and a fall huddle report submitted by nursing which

includes the fall details.

Development of an evidence based falls prevention video

A professional communication and marketing firm was engaged to assist the researcher in

development of message concepts. A content outline was developed addressing the three

determinants of TPB to influence the patient's behavioral intent and social support theory

for messages to guide family to support the patient in behaviors to prevent falls. The

social marketing planning process[13] was used to develop falls prevention messages and

communication strategies. Messages were pretested with three patients on the study unit

who met study inclusion criteria. The patient feedback was consistent with the literature review findings.

The video delivers messages from the content outline by a narrator, two organizational Registered Nurses, and a family member. The family member had previously experienced the loss of a parent due to a serious injury and eventual death related to a fall in another facility.

Research Procedures

Initial design used trained unit Registered Nurse Case Manager and Charge Nurses collaboratively review the daily report, discuss cognitive status of the patient, and consent patients meeting inclusion criteria. A review of the consent process after the first month of Phase 1 determined that in order to consistently consent patients meeting study criteria dedicated staff would be necessary to systematically attempt to consent patients. Trained Patient Care Technicians were scheduled for several hours per day by the end of Phase 1 of the study in order to dedicate time to the consenting process. Past history of diagnosis related to cognitive dysfunction was added to the daily report, and patients were reviewed with the Charge Nurse prior to attempting consent. Consenting of patients did not occur on the weekends for both Phases of the study due to resource limitations.

During Phase 2, the falls prevention video was initiated by the unit Registered Nurse or Patient Care Technician following patient consent. Poor compliance with documentation and research interventions to consented patients required weekly emails and verbal reminders to Registered Nurses in staff meetings of their roles in the study.

Data analysis

All statistical tests were performed using SPSS software v. 21. It was determined that target group sample size of 30 would provide 80% power to detect differences between groups.[29] Frequencies and means were calculated for sample characteristics. Phase 1 and Phase 2 groups were compared on demographic characteristics and length of stay variable using appropriate statistical tests such as the t-test and chi-square. The data for length of stay were positively skewed; thus, the Mann Whitney U test was used to compare mean ranks. Generally chi-square test was used to check differences for the delivery of interventions between groups. All statistical significance tests were set at $P < 0.05$. Fall and fall with injury rates were calculated per 1000 patient days. Effect size was calculated for strength of association using the Pearson r. Fall huddle reports for two patient falls during the study were analyzed for variable trends.

RESULTS

Findings

During the study Phase 1 and Phase 2, 1897 patients were admitted or transferred into the study unit setting. Of the 630 patients admitted or transferred to the study unit during Phase 1, 100 (16%) patients consented to participate in the study, 74 (12%) declined to participated, and 456 (72%) were either not eligible or consent was not attempted. In Phase 2, 92 (16%) of the 565 patients admitted or transferred to the study unit consented to participate in the study,143 (25%) of the patients declined to participate, and 330 (58%) were either not eligible to participate or for which consent was not attempted. Only 17 (19%) of patients' family/significant others consented to participate in the study

during Phase 2. Interestingly a higher proportion of patients declined during Phase 2

which may reflect an increased number of patients approached to participate in Phase 2.

Demographic and length of stay characteristics between groups are summarized in Table

1. Statistical analysis revealed no missing data. There were no statistically significant

differences in characteristics between groups.

There was a statistically significant difference between groups in the proportion of

patients receiving any kind of falls educational intervention based on the study phase they

were in, $\chi2(1, N = 192) =0.20$, $P < .001$. Interestingly, in Phase 2, the majority (82%) of

participants received a falls education intervention (falls brochure or falls brochure and

video) while in Phase 1 less than half (42%) of participants received a falls education

intervention (brochure). The effect size for this analysis (Phi = .41) was found to exceed

Cohen's[30] convention for a medium effect (r = 0.30). A similar number of consented

patients in Phase 2 had documentation in their medical record that they received the falls

prevention brochure (n = 44, 48%). A small portion of participants in Phase 2 (n = 7,

8%) had documentation of viewing the video with their family/significant other even

though this represents less than half the number of family members who consented to

participate (n = 17).

Two falls occurred without injury during Phase 1 and no falls or falls with injury

occurred during Phase 2. Phase 1 fall rate was 6.01 (2 falls/333 patient days x 1000

patient days). Phase 2 fall rate was 0.0 (0 falls/347 patient days x 1000 patient days).

The effect size for this analysis (Phi = .10) was found to just meet Cohen's[30] convention

for a small effect (r = 0.10). The low number of falls during both Phases did not allow

for a statistical difference between the Phase 1 and Phase 2 groups nor the ability to run
any statistical analysis for differences between rates. No falls with injury occurred in
either Phase 1 or Phase 2.

Comparison of Post-Fall Huddle Forms between the patient falls revealed falls occurred
within 2 and 5 hours following administration of opiates for pain and occurred when the
male patients attempted to toilet without calling for the nurse. Nursing had performed
rounds on each patient within an hour of the patient's fall. The risk assessment tool
scored one patient as a moderate risk and the other as a high risk, with one patient having
a history of a fall at home within the past six months. Only one of the fall patients had
documentation of receiving the fall prevention brochure. Neither fall resulted in an
injury.

Discussion

The purpose of the study was to reduce falls and falls with injury in the older hospitalized
adult. Viewing of a falls prevention education video by the patient and family support
member was intended to increase the patient's knowledge of fall risk, influence their
behavioral intent to follow fall prevention strategies, and improve understanding by the
family support member on their role in supporting the patient in fall prevention
behaviors. No statistical evidence was found to support the study hypothesis due to the
small number of patients with family support consenting and viewing the evidence based
falls prevention video (n = 7). The small number of falls occurring during either Phase of
the study prevented planned statistical analysis for comparison of the two study Phase
groups.

While the study did not reinforce social support theory as a component for the theoretical model, the study may indicate the benefit for use of evidence based messages with patients based on the TPB when measuring and comparing fall rates from a clinically significant improvement aspect. The clinical significance derives from findings that the majority of patients (82%) in Phase 2 received the brochure and/or video fall prevention education with messages based on the TPB and fell less frequently (0 per 1000 patient days) than patients in the Phase 1 comparison group. Phase 1 comparison group participants received a falls education brochure less than half the time (42%) and fell more frequently (6.01 per 1000 patient days).

Interestingly, implementing the falls education video in Phase 2 increased the number of patients overall who received some type of education; 82% received either the brochure alone or the brochure and the video, while in Phase 1 only 42% received the brochure. The fidelity of patients receiving the brochure during Phase 2 was not so different (48%) than during Phase 1 (42%). Therefore, there may be clinical significance for patients in Phase 2 receiving falls prevention education by video (70%), and teach-back performed the majority of the time (94%), with falling less frequently than patients receiving usual care including the brochure. Analysis revealed a statistically significant difference ($P < .001$) between these groups related to patients receiving falls prevention education and the effect size for this difference exceeded Cohen's[30] convention for a medium effect. Effect size is said to emphasize the size of the difference and estimates the magnitude of effect between groups without regard to sample size.[31,32]

Standards of the American Nurses Credentialing Center's Magnet Recognition Program®
set the expectation for hospitals to outperform nationally benchmarked mean
comparisons fall rates.[7] The National Database of Nurse Sensitive Indicators (NDNQI)[33]
is one source of national benchmark data for nurse sensitive indicators and used by many
hospitals. Of clinical significance to this study, the NDNQI mean fall rate for the 746
like units for comparison to the study unit in the fourth quarter 2012 (Phase 1) was 3.81
(SD 2.13) as compared to the Phase 1 participant fall rate of 6.01 (approached the 90th
percentile performance for this quarter benchmark). The NDNQI mean fall rate for the
first quarter 2013 (Phase 2) for 768 like units for comparison was 3.60 (SD 2.06) as
compared to the study unit's participant rate of 0 (below the 10th percentile in comparison
group). While there is no statistical difference in fall rates between the groups, these
national benchmark comparisons are important in light of the statistical differences and
medium effect size between the groups in the percentage of patients who received any
type of fall prevention education.

Although the small numbers of falls in either group hindered analysis of statistical
comparison for falls between groups, the effect size met Cohen's[30] convention of 0.10 for
a small size effect. Durlak[31,p. 924] discussed the need for researchers to evaluate the
practical or clinical significance in the context of "the extent to which there has been a
meaningful change in participants' lives". Researchers are instructed to interpret the
effect size in relation to how difficult an outcome is to obtain when evaluating clinical
significance.[31] An effect size of 0.10 with an outcome that is difficult to obtain may be of
greater clinical significance than an effect size of 0.50 when the outcome is relatively

easy to obtain or less critical to the health of participants.[31] Falls in the acute care setting have been a difficult problem to eradicate and at times devastating to the life of the older adult. Therefore this small effect size finding may be of clinical significance in the search for fall prevention interventions.

The statistical differences in the percentage of patients who received any type of falls prevention education between the Phase 1 and Phase 2 groups may support previous study findings. Hill and colleagures[10] compared DVD education, workbook education and a control group receiving no education. Participant's improvements in knowledge of falls and prevention improved to a greater extent using the DVD method, but both treatment groups were statistically significantly for improvement as compared to the control group. Phase 2 results of this current study indicate a high percentage of patients received the video education (70%) as a targeted intervention and there was a statistically significant difference in the number of patients receiving any falls education between Phase 1 (42%) and Phase 2 (82%). Thus the lower fall rates in Phase 2 of this current study may support Hill and colleagues' previous work for effectiveness of theory based falls education.

The current study findings for lower fall rates for older adults receiving video falls prevention education followed by teach-back may also be consistent with previous research by Haines and colleagues.[9] This previous study, a randomized 3-group trial, compared a video and written materials falls prevention education intervention with follow up by a health counselor, a video and written materials only intervention, and no specific falls education control group. Fall rates for this previous study were much lower

in the cognitively intact group receiving video and written materials with a health counselor follow up (4.01 per 1000 patient days) than the video and materials only group (8.18 per 1000 patient days). Both intervention groups had lower fall rates than did the control group (8.72 per 1000 patient days). The health counselor follow up in this pervious study was time intensive taking between 20 and 36 minutes per patient and study design allowed a week for this counseling to occur. Similarly, in a 6 week student performance improvement project on a neuroscience unit, patient and family education resulted in no falls; however, the teaching time ranged from 5 to 20 minutes.[34] The teach-back method of this current study served as a less resource intensive intervention and within the length of stays of U.S. hospitals.

The information from the fall huddle reports for the two patients that fell during Phase 1 did not provide any further evidence for refinement to messages contained in the falls prevention video.

Limitations

It is important to note the limitations of this study. First, the nonrandomized study was conducted in one unit in one acute care facility. The study needs to be conducted in different types of units in multiple health care organizations. Second, the sample size was too small to conduct the planned statistical analysis. The small sample size was likely related to the failure of nursing personnel to consistently perform and/or document interventions, and the difficulty in procuring consent from both patients and families. Third, the relatively short duration of the study was a limitation. Finally, no test of cognitive function was performed prior to consenting patients and therefore it is possible

that participants may have been included in the study that had some confusion or cognitive impairment

Implications for future research

In addition to replicating the study in different types of units in multiple health care organizations over a longer period of time, there are other implications for research. Future research might also be conducted to determine if allowing family members of cognitively impaired patients to view the video with teach-back and measure the impact of falls for this challenging population of patients. Future research should be conducted not only to determine the impact of evidence and theory based videos on patient falls, but also to determine which combinations of interventions are most effective in preventing falls.

Implications for nursing administrative practice

Although the hypothesis was not supported, there were fewer falls in the Phase 2 intervention group than in Phase 1 comparison group, and previous studies using multimedia education was supported, which is of clinical significance to nursing practice. Thus, nursing leaders should indeed continue to implement and evaluate falls prevention protocols that include video based education and teach-back. As health care reform advances, reimbursement will be reduced and transition from volume based payment to patient clinical outcome based payment will challenge organizations to reduce costs while improving their benchmark comparison rankings. It is imperative that as nurse leaders effective and efficient ways are developed to assure patients are educated and better motivated to follow behaviors that promote health. Theory and evidence based

education videos with teach-back may be an efficient technological tool to engage

patients in fall prevention. Using evidence based messages to develop videos and other

educational materials could provide a new standard of practice for the prevention of falls

and other adverse outcomes as well as provide patients and families some control over

those outcomes.

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Table 1. Group Demographics and Length of Stay Characteristics

	Group 1 Phase 1 Falls Brochure	Group 2 Phase 2 Falls Brochure, Video, and Teach-Back	
Variable	(n=100)	(n=92)	P
Gender, n (%)			>0.05
Male	36 (36)	36 (39.1)	
Female	64 (64)	56 (60.9)	
Primary Language, n (%)			>0.05
English	100 (100)	91 (98.9)	
Spanish	0 (0)	1 (1.1)	
Race, n (%)			>0.05
African	3 (3)	3 (3.3)	
American	96 (96)	84 (91.3)	
Caucasian	1 (1)	1 (1.1)	
Hispanic	0 (0)	4 (4.3)	
Other			
Age, Mean (SD)	74.05 (7.933)	74.16 (8.499)	>0.05
LOS, Mean (SD)	3.33 (3.77)	3.77 (3.762)	>0.05