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Systematic Literature Review on Fall Prevention in an Acute Care Hospital Setting

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This is to certify that the doctoral study by

Sonia Hudson

has been found to be complete and satisfactory in all respects,

and that any and all revisions required by

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2019

Abstract

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by

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MA, New York University, 1996

BS, Hunter College of the City University of New York, 1991

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

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Abstract

Falls, with and without injury, in acute care hospitals are quite common but can be prevented if appropriate interventions are in place to address this issue. It is imperative that nurses assess fall risks of all patients admitted to the hospital and advocate for appropriate interventions to prevent falls in those who are found to be at risk. The purpose of this project was to recommend changes to the current fall prevention protocol in the project facility, an acute care hospital, based on best practices identified in a systematic review of the literature. At the time of the project, the hospital had a high rate of falls. The clinical practice question addressed by this project focused on the evidence-based fall prevention interventions that have resulted in a decreased fall rate among patients on medical-surgical units in an acute inpatient hospital setting. This doctoral project was informed by Kolcaba's theory of caring, and the major source of evidence was a systematic review of the literature focusing on fall prevention. Findings indicated that identification of fall risk factors and implementation of multifactorial fall prevention interventions, such as fall prevention teams, unit fall team champions and use of a fall risk scale, can reduce falls on medical surgical units in acute care hospitals. It was recommended that a multidisciplinary fall prevention team be developed in conjunction with unit fall team champions and that a fall risk scale be used to bridge the practice gap. If implemented, these changes may benefit patients, nurses, and the organization as a whole through decreased falls, lengths of stay, and health care costs.

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Dedication

This project is dedicated to my son Tyrone (deceased); my daughters Keisha (registered nurse) and Sade (law student), who supported me throughout my studies and encouraged me to fulfill my dreams; my granddaughters Janae and Jaelynn; and my grandson Donato.

Acknowledgments

Special thanks to Dr. Sue Bell, my project chair, who guided me in developing this project, and to the faculty of the DNP program at Walden University who enriched my learning. I also want to thank my late son Tyrone for his dedication in ensuring that my computer was always updated to meet the challenges of an online course of study; my daughters Lakeisha and Sade, who constantly encouraged me at times when I felt like quitting; Steve, who constantly checked in with me to make sure I was on target with my studies; Winifred (mom) who offered ongoing support, and other family members and friends who helped me progress to this point in my academic career.

Table of Contents

List of Tables

List of Figures

Section 1: Introduction

Introduction

Falls have contributed to major injuries, some resulting in death, among patients admitted to acute care hospitals. Ambutas, Lamb, and Quigley (2017) found that of 345,800 falls on medical surgical units in the United States, 26.1% resulted in injury and of those injurious falls, 2 in 1,000 patients died. Falls also result in prolonged stays in the hospital that impose significant financial and social burdens on patients, families, health care organizations, and the population at large (Godlock, Christiasen, & Feider, 2016). Thus, there is a need to decrease the number of falls and injuries in the inpatient population. To do so requires modification of current falls prevention protocols through implementation of new evidence-based practices (EBPs). Ambutas et al. (2017) wrote that based on the evidence, there is a need for multifactorial interventions to reduce patients' falls.

Problem Statement

The problem being addressed in this Doctor of Nursing Practice (DNP) project was the high rate of falls in an acute care hospital setting; at the time of the project, the rate was 2.7 per 1,000 patient days. Although this rate is not considered exceptionally high, the Centers for Medicare and Medicaid Services (CMS) advised that falls in hospitals should be a never event as cited by (Bouldin et al., 2014). Wexler and D'Amico (2015) found that the hospital fall rate is almost 9 falls per 1,000 patient days, with approximately one-third to one-half of all falls resulting in injury. The researchers further cited Centers for Disease Control and Prevention (CDC) data, which showed fall-related deaths among older adults in the United States in 2011 to be 22,900.

Godlock et al., (2016) wrote that the effects of falls can be devastating and include physical, emotional, and financial consequences, for which appropriate, effective interventions must be implemented. The researchers further indicated that injuries sustained from falls can result in increased inpatient hospital days, unscheduled surgeries, and sometimes loss of life.

Nazarko (2015) identified several risk factors for falls, which include balance and mobility problems. The researcher suggested a multidisciplinary approach to address this problem, indicating that this approach would decrease the risks of falls and optimize quality of care. According to Tzeng and Yin (2015), there is a significant challenge to preventing falls in the inpatient setting and suggested adequate fall prevention initiatives to prevent or decrease falls.

There is a major need for nurses to be involved in evidence-based interventions to address the serious problem of falls. The American Association of Colleges of Nursing (AACN; 2006) DNP Essential I: Scientific Underpinnings for Practice calls for nurses to translate their scientific evidence-based knowledge to practice, thus promoting positive health outcomes. This doctoral project is aligned with the stated DNP Essential and is meant to promote healthy outcomes of patients and populations through implementation of an evidence-based falls protocol.

Purpose

There are gaps in practice related to patient falls at the project site, and the patient fall rate remains high compared to national benchmarks. The purpose of this project was to identify gaps in the hospital's fall prevention protocol through a systematic review of

the literature and to use the evidence to recommend changes to the current protocol that will work within the organization. The clinical practice-focused question was, What are the evidence-based fall prevention interventions that have resulted in a decreased fall rate among patients on medical floors in acute inpatient hospital settings? I plan to present recommendations based on the literature for a revised evidence-based fall prevention protocol for the medical floors in the acute care hospital to the nursing administrators at the facility.

Nature of the Doctoral Project

A literature review was the major source of evidence for this project. I conducted a systematic review of the literature focusing on evidence related to fall prevention. Literature was aligned with the clinical practice question developed for this project. The literature databases searched were the Cumulative Index of Nursing and Allied Health Literature (CINAHL) (2010-2019), Medline with Full Text (2010-2019), and the Cochrane Database and Systematic Reviews (2010-2019). The search terms for the literature review in this project were *falls*, *risk factors*, *falls with injury*, *falls prevention strategies*, *hospital falls*, *medical-surgical units*, and combinations of these words. Grove, Burns, and Gray (2013) identified best research evidence to be of high quality with empirical knowledge originating from several superior studies. The purpose of the systematic review was to identify the studies and fall prevention guidelines that are of high quality and demonstrate fall reduction in settings similar to the medical-surgical units in the project hospital.

The approach for this project was to analyze current fall risk protocols along with interventions that are being used on medical surgical units in acute care hospitals and have resulted in a significant decrease in the inpatient fall rates. I analyzed data by fall rates, injury occurrence (i.e., falls with injury and falls without injury), and type of fall. Based on the systematic review findings, a revised fall prevention intervention protocol based on best practices was developed to be presented to the nursing administration and recommended for implementation.

Significance

The Agency for Healthcare Research and Quality (AHRQ), (2013) defined a fall as descending to the floor unintentionally, with or without injury, and indicated that falls in the hospital are preventable. Yet, in the United States, there are about 750,000 hospital falls annually, which result in serious injury and increased health care cost. CMS has described falls as a complex social health problem with multiple contributing factors (American Occupational Therapy Association (AOTA), 2010). However, falls are typically managed like chronic health problems even if the episodes are acute (AOTA, 2010). CMS developed quality improvement initiatives, one of which focused on hospital-related falls, and penalizes hospitals by withholding payments related to injury from falls occurring during the hospital stay as cited in (Ambutas et al. 2017).

Evaluating the effectiveness of a fall prevention program design and implementing risk reduction strategies can improve patients' safety and decrease falls and fall-related injuries (Quigley et al., 2016). Nurses must be aware of the population at risk for falls and collaborate with other health care professionals in developing fall and

injury prevention programs (Quigley et al., 2016). Nazarko (2015) stated that adverse effects on individuals' lives include disability, pain, distress, and sometimes death, while Wexler and D'Amico (2015) believed that patients who experience falls develop fear of falling, depression, and anxiety. These data support nursing practitioners' incorporation of evidence from the research to address fall prevention in the acute care hospital to foster patient safety. Managers, leaders, and administrators should also promote EBP protocols to effectively manage patients who are at risk for falling. Knowledge gleaned through an EBP protocol developed from a systematic literature review may benefit nurses and the organization as a whole. In addition, the target population, older patients at increased fall risk, may benefit through application of a better-informed protocol.

I obtained Institutional Review Board (IRB) approval from Walden University prior to beginning the DNP project. The project did not include any human subjects and did not involve collection of patient identifiers. No patient data were used in the final project. I drew from the Walden University *Manual for Systematic Review* for the DNP in developing the project, which may benefit nurses, the organization, and patients at risk for falls in an acute care hospital. This project has resulted in an updated EBP protocol for consideration by management to decrease falls on medical-surgical units in the acute care setting. The practice-focused question and the approach used to address this question were aligned with the fall risk problem identified for this project. The systematic review for this project was aligned with the DNP Essentials (AACN, 2006), particularly Essentials I, II, III, and VII.

Summary

Falls among patients admitted to U.S. inpatient hospitals continue to rise and have resulted in serious injuries associated with poor health outcomes, negative social impact, and increased financial burden on patients, families, and health care organizations (Godlock et al., 2016). To decrease the incidence and rates of falls, adequate fall prevention protocols must be developed and implemented in the acute care hospital setting. I developed a protocol to address this problem for this project. In Section 2, I provide more context on the problem of falls in hospitals nationally and specifically at the project facility.

Section 2: Background and Context

Introduction

Falls are a serious health care problem and often result in major injuries and even deaths. In addition, falls can cause significant physical, emotional, and financial consequences; thus, there is a need for appropriate, effective interventions (Godlock et al., 2016). In conducting this project, I sought to identify the gaps in the project site's fall prevention intervention protocol on medical-surgical units in the acute inpatient hospital setting and use the evidence obtained through the systematic review of the literature to recommend changes to fill the gaps. The practice-focused question was, What are the evidence-based fall prevention interventions that have resulted in a decreased fall rate among patients on medical-surgical units in acute inpatient hospital settings? The background and context section of this project will focus on the concepts, models, and theories that informed the project, the project's relevance to nursing practice, the local background and context, and the role of the DNP student.

Concepts, Models, and Theories

I selected Kolcaba's theory of comfort to inform this doctoral project as it embodies caring as a fundamental attribute of nursing. Kolcaba, Tilton, and Drouin (2006) described comfort as fulfilling the basic human needs for release, ease, or transcendence from perturbing health problems. The theory indicates that when comfort is maximized, health outcomes are improved (Kolcaba et al., 2006). The major concepts in this project are comfort and comfort care taken from Kolcaba's theory of caring; I chose these concepts because many of the risk factors for falls can be diminished if patients are cared for and feel comfortable (McEwen et al., 2014). A proposition of

comfort theory linked to the concepts of comfort and comfort care is that delivering interventions in a caring, effective manner will result in enhanced comfort (Kolcaba et al., 2006). A second proposition is that providing comfort care to patients and families who engage in healthy behaviors will result in improved health-related outcomes (Kolcaba et al., 2006).

Kolcaba's theory of comfort comprises seven key concepts that are linked to eight distinct proposals (Kolcaba et al., 2006). Nurses can use these proposals to guide the delivery of nursing care to optimize patients' outcomes. Kolcaba's comfort theory can be applied to nursing care of patients across the continuum, irrespective of location (McEwen et al., 2014). Kolcaba identified comfort as a concept aligned with activities to promote positive patients' outcomes (Kolcaba et al., 2006). In the context of comfort, Kolcaba identified four areas in which patients can experience comfort: physical, psychospiritual, environmental, and sociocultural. Physical encompasses the sensation of one's body; psychospiritual, one's internal well-being; environmental, the external surroundings; and sociocultural, the interpersonal, family, and social relationships (Kolcaba et al., 2006).

Evidence indicates that nursing practice depends on theory and should, therefore, be the basis of nursing care. Key theorists, philosophers, and scholarly writers have linked nursing care to Kolcaba's comfort theory, indicating that this theory can be applied to all areas of nursing care. According to Krinsky, Murillo, and Johnson (2014), Kolcaba's comfort theory is compatible with providing efficient holistic nursing care, which can always be optimized when comfort needs are met. Interventions to promote

comfort, incorporating patients' comfort needs, can be achieved through the application of Kolcaba's middle range theory (Krinsky et al., 2014).

According to Kolcaba's comfort theory, comfort in nursing is based on satisfying the basic human needs related to relief, ease, and transcendence that arise from stressful situations (Ng, 2017). Kolcaba's comfort theory allows for identification of patients' physical, psychospiritual, sociocultural, and environmental comfort needs. Once their needs are identified, nurses are able to plan appropriate interventions to enhance care and optimize outcomes (Ng, 2017).

In reviewing the literature, Apostolo (2009) found that there was a unified agreement between Morse and Kolcaba, who both believed that providing nursing comfort care is a nursing intervention and patients' comfort is a result of the intervention. Kolcaba's theory is based on the premise that outcomes must be evaluated before comfort is considered complete (Apostolo, 2009). Comfort theory encompasses "care, symptom management, interaction, holism, healing environment, identification of needs and homeostasis" (Kolcaba, Tilton, & Drouin, 2006, p. 539).

Relevance to Nursing Practice

The number of hospital falls in the United States has been estimated to be about 700,000 annually resulting in costs of more than $19 billion per year. (Domingue et al., 2018). According to Oliveira et al. (2018), falls result in minor to major injuries, including death, and are deemed the highest cost of any injury in older patients. Falls in hospitals are not new; neither are interventions to prevent falls. Falls in acute care hospitals date back more than 50 years. There have been ongoing interventions to address

this issue (Domingue et al., 2018), yet the rate of falls in hospitals continues to rise. The national average number of falls with injury rate in hospitals during 2011, according to CMS, was 0.53 per 1,000 discharges (Tzeng, Hu, & Yin, 2016). Overall, hospitals in the United States average 3.3 to 11.5 falls per 1,000 patient days (Bouldin et al., 2014).

Nurses play an important role in fall prevention in the hospital and must be an intricate part of evidence-based interventions in the management of patients who are at risk for falling. Implementation of effective and appropriate evidence-based fall intervention strategies in the hospital may change patients' outcomes, result in positive social change, and positively impact the organization's finances. When patients at risk for falling are under the care of a nurse, the quality of the relationship between the nurse and patient may be decreased (Rush et al., 2009). "Knowing the patient" is crucial to the nurse-patient relationship (Rush et al., 2009, p. 358). Moe, Brockopp, and McCowan (2015) indicated that nursing care is critical in preventing falls. Fall risk assessment and subsequent implementation of fall prevention measures are indicated based on patients' risk scores, and is seen as the initial, imperative step in the task of preventing falls (Moe et al., 2015). The Joint Commission's mandate requires hospitals to implement fall reduction programs that are aligned with risk assessment and effective fall prevention programs (Moe et al., 2015).

Numerous researchers have sought to identify risk factors for falls in hospitals, and researchers have developed strategies to reduce or prevent such occurrences. Melin (2018) identified several studies that included fall prevention strategies that led to a decrease in the fall rate in the hospital setting. Among these are

- Neiman, Ranie, Thrasher, Terry, and Kahn, who used an electronic fall risk assessment tool called "(I'M SAFE)" in conjunction with an acute care hospital multidisciplinary fall prevention program, which lead to a decrease from 0.67 falls per 1000 patient days to 0.51 falls per 1,000 patient days;
- Stern and Jayasekara, who used falls assessment and intervention programs, which included screening for risk factors, wearing safety footwear, and adjusting bed height, which resulted in a decreased rate of falls in older adults in an acute care hospital; and
- Von Renteln-Kruse and Krause, who noted a decrease in the incidence of falls in a geriatric clinic in a teaching hospital, from 10 falls per 1,000 patient days to 8.2 falls per 1,000 patient days as cited in (Melin, 2018). Interventions included use of an admission fall risk assessment, post fall assessment, risk alert, an information pamphlet, and assistance with toileting and transfers as cited in (Melin, 2018).

Multiple studies have been conducted on fall prevention in the acute care hospital setting, and irrespective of the recommended evidence-based interventions, patients' falls are still a challenge. Falls result in major impact on patients' health outcomes, families, and health care organizations, significantly increasing health care cost for all. There is an opportunity for nurses to become true advocates for patients at risk for falling and become involved in evidence-based research to identify or develop interventions to decrease falls in the acute care hospital setting.

Local Background and Context

Hospital falls are prevalent, resulting in a threat to the safety of hospitalized patients. There are 2.7 falls per 1,000 patient days at my project site, and approximately 95% of these are accidental, with approximately 20% resulting in injury. The cost related to managing patients post fall is significant. According to Bouldin et al., (2014), accidental falls occur in about 2% of hospitalized patients and of all falls in hospitals, approximately 25% result in injury and 2% in fractures. Associated costs are substantial and include costs to care for patients post fall, increase in length of stay, which varies from 6 to 12 additional days in the hospital, and liability (Bouldin et al., 2014). Hence, there is a need to identify evidence-based research that will answer the practice-focused question being addressed in this project, and provide interventions that are appropriate and effective in preventing falls in the hospital.

The institutional context of the organization for which this evidence-based research finding is being recommended for implementation is a patient-oriented acute care hospital. There is a strong support for evidence-based research, and the clinical and management staff are encouraged to adopt evidence-based changes that will improve patients' outcome, but also increase productivity. The regulatory bodies are the Joint Commission and the Office of Mental Health. There are fall prevention policies in place that have undergone several changes over the last 5 years. The ages of patients range from young adults to geriatric with most falls occurring in the geriatric population. Cost-effective care is the primary goal of this organization and there is evidence of shared governance. The mission and vision of the organization is to provide cost-effective care

to patients in the community and all patients who present to the hospital for care. This can result in a healthier community.

CMS identified falls as a nursing-sensitive quality outcome, which can be reduced with improved nursing care as cited by (Bae, 2016). CMS also introduced a Medicare financial disincentive policy that will penalize providers and hospitals in the event of preventable adverse outcomes, with falls being one of these indicators (as cited in Bae, 2016). This disincentive policy was initiated on October 1, 2008 (Bouldin et al., 2014).

Role of the DNP Student

I am employed as a certified adult nurse practitioner in the organization to which the evidence-based findings of my doctoral project are being recommended for implementation. As a consultant in addiction medicine, I have been apprised of many falls in this patients' population, in particular the older patients who are withdrawing from alcohol. I have been privileged to have completed my practicum experience at this organization and worked on a project relating to falls and fall interventions in this context. As a result, I was able to collaborate with major stakeholders, identified some fall risks among patients admitted to the hospital, and reviewed the literature for evidence-based interventions suitable for the population. Though implementation was not initiated during my practicum experience, the collaborative experience was quite positive.

This doctoral project was based on a systematic review of the literature with the purpose of finding appropriate evidence-based fall prevention interventions that can be effectively implemented in the organization. The AACN (2006) Essentials serve as a guide to DNP students for the implementation of evidence-based changes in health care.

Essential 1: Scientific underpinnings for practice (AACN, 2006) highlighted how DNP education is geared toward leadership development that will facilitate enhanced patient care, and promote evidence-based change through strategic methods of evaluation (Sherrod & Goda, 2016).

There is a major need to decrease falls and associated injuries in inpatient hospital settings. As a DNP student preparing to become a DNP leader, I am motivated to advance nursing practice, and foster an evidence-based practice environment to improve patients' outcomes, to become a part of the policy making process, and to participate in redesigning of the health care system. Decreasing the fall rate, a nursing-sensitive indicator, is a good place to start.

The major bias that I found in working on this project has to do with the screening tools that were used to assess fall risk. According to Haines, Hill, Walsh, and Osbourne (2007), design-related bias is likely when evaluating its accuracy and could result in failure of the program. To address this bias, I conducted a thorough evaluation of the screening tools used in the research studies.

Summary

There has been an extensive number of evidence-based articles on falls and fall interventions in the acute inpatient hospital setting in the U.S. However, gaps in practice still exist on medical surgical units, resulting in numerous preventable falls (Godlock et al., 2016). It is crucial that these gaps be filled so that patients can experience improved outcomes during any episode of hospital admission.

Section 3: Collection and Analysis of Evidence

Introduction

The problem addressed by this DNP project was the rate of falls in an acute care hospital setting with a fall rate of 2.7 per 1,000 patient days. Several researchers have found that the effects of falls are devastating, affecting individuals' physical, emotional, and financial status (Ambutas et al., 2017; Godlock et al., 2016). Researchers have also indicated that injuries sustained from falling can result in increased inpatient hospital days, unscheduled surgeries, and death (Godlock et al., 2016). Several risk factors for falls including balance and mobility problems have been identified, and there is a need for appropriate interventions to be implemented to address this serious problem. Nurses can contribute significantly to the implementation of evidence-based interventions, through the application of Kolcaba's theory of caring to address inpatient hospital falls. This can be achieved when nurses provide care to patients based on their individual needs. This doctoral project is aligned with DNP Essential I: Scientific Underpinnings for Practice (AACN, 2006) and is meant to promote healthy outcomes of patients and populations through implementation of an evidence-based fall prevention protocol.

The purpose of this project was to identify the gaps in the hospital's fall prevention intervention protocol and to use the evidence to recommend changes to the current fall prevention intervention protocol for medical-surgical units. Falls in the project hospital are primarily accidental and result in injury to some patients. The cost of managing patients' falls on medical surgical units in acute care settings is substantial, and include direct patient care, increased length of stay in the hospital, and liability (Bouldin

et al., 2014). The acute care hospital for which this project's findings are being recommended for use is highly research-based; thus, facilitating evidence-based changes in the management of patients should not be difficult. Implementation of project recommendations may result in cost-effective care of the inpatient population, which ranges from young adults to geriatrics.

In this section of the project, I will address the practice-focused question, identify the sources of evidence, and discuss the analysis and synthesis of the evidence generated through the systematic review. Hospital falls are prevalent, resulting in grave threat to the safety of hospitalized patients (Ambutas et al., 2017). There are gaps in practice related to patients' falls in the hospital, and as such the fall rate remains high.

Practice-Focused Question

The clinical practice-focused question answered by this project was, What are the evidence-based fall prevention interventions that have resulted in a decreased fall rate among patients on medical-surgical units in acute inpatient hospital settings? Implementation of a revised evidence-based fall protocol on medical-surgical units in the acute care hospital may decrease the fall rate, resulting in improved social, physical, and financial outcomes. As indicated, the purpose of this project was to identify the gaps in the hospital's fall prevention intervention protocol and to use the evidence to recommend changes to the protocol for medical-surgical units within the organization. A systematic review of the literature provided evidence-based fall prevention interventions, which resulted in a decreased fall rate on medical-surgical units in acute care hospitals thus providing answers to the practice-focused question.

Sources of Evidence

A systematic literature review was the major source of evidence for this project. In conducting the review, I focused on the evidence related to fall prevention. The literature was aligned with the clinical project question developed for this project. I used inclusion and exclusion criteria when searching the literature. Grove et al., (2013) identified best research evidence to be high quality when empirical knowledge originating from several superior studies is incorporated. The purpose of the systematic review was to identify the studies and fall prevention guidelines that are of high quality and demonstrate fall reduction in similar settings. This high-quality evidence-based literature review will facilitate the purpose of the project, by utilizing the evidence to target fall reduction and recommending changes to the protocol for use within the organization.

The approach for this project was to analyze current fall risk protocols along with data that have been used in hospitals and have resulted in a significant decrease in inpatient fall rates. I synthesized data by fall rate, injury occurrence (i.e., falls with injury and falls without injury), and type of fall. Based on the systematic review findings, I have recommended a fall prevention intervention protocol based on best practices, which I will present to the nursing administration for consideration of implementation.

The literature databases searched were CINAHL (2010-2019), Medline with Full Text (2010-2019), and the Cochrane Database and Systematic Reviews (2010-2019). The search terms for the literature review in this project were *falls*, *risk factors*, *falls with injury*, *fall prevention strategies*, *hospital falls*, *medical-surgical units*, and combinations

of these words. Articles with a focus on falls and fall prevention strategies on medical-surgical units in the acute care hospital setting were retrieved from peer-reviewed journals.

The search inclusions and exclusion criteria ensured that the evidence was applicable to the selected population. The inclusion criteria were studies that focused on risks factors associated with falling and clearly listed these risk factors in the article. The second inclusion criteria were studies that identified fall prevention strategies on medical-surgical units in an acute care hospital setting, which were implemented and resulted in a decreased number of falls. Exclusion criteria included studies that have not clearly discussed the interventions or have not implemented the interventions in practice, studies that were not on medical-surgical units, studies that were duplicated, and articles that were not evidence-based. All research articles were selected and reviewed by one reviewer, me. A PRISMA flowchart is included in this project to show the number of articles reviewed for use in the completion of the project. The PRISMA flowchart of the systematic literature review identifies the number of articles that met inclusion criteria as well as the number of articles that were excluded from the final analysis and synthesis (see Figure 1).

I obtained IRB approval from Walden University prior to beginning the DNP project. The project did not include any human subjects or involve collection of patient identifiers. No patient data are presented in the final project. The project is aligned with the *Manual for Systematic Review* and may benefit nurses, the organization, and patients at risk for falls in an acute care hospital.

Analysis and Synthesis

A summary table of analyzed articles identifies the articles retained to support the project findings and recommendations (see Table 1). To ensure the integrity of the evidence, I conducted the research in alignment with the guidelines set forth by Walden University *Manual for Systematic Reviews*. The findings reported are based on the evidence and not on my beliefs. The analysis used in this doctoral project to address the practice-focused question was descriptive and included data presented in selected studies on fall rates, rates of falls with and without injury, and factors contributing to falls. I combined the descriptive data with the fall intervention information from the related articles to produce an overview of the types of interventions that have produced reductions in the numbers of falls.

Summary

Collecting and analyzing evidence are crucial steps in conducting systematic literature reviews. To perform an effective search, databases and search engines should be reliable. In addition, special steps should be taken to ensure that appropriate tools and techniques are used in the information collection process, allowing for the best evidence to emerge (Grove et al., 2017). This evidence can then be recommended for implementation in the clinical setting, to fill the identified gap-in-practice.

Section 4: Findings and Recommendations

Introduction

The local clinical practice problem addressed in this project was the rate of falls in an acute care hospital where there were 2.7 falls per 1,000 patient days. Due to gaps in practice in acute care hospitals, the rate of falls remains high (Godlock et al., 2016). As such, the purpose of this project was to identify the gaps in the project facility's current fall prevention protocol and provide evidence-based recommendations to fill the gap and decrease the fall rate. The clinical practice-focused question was, What are the evidence-based fall prevention interventions that have resulted in a decreased fall rate among patients on medical-surgical units in acute inpatient hospital settings?

Upon obtaining Walden University IRB approval (approval number 09-23-19-0736856), I conducted a systematic review of the literature to identify the evidence related to fall prevention on medical-surgical units in the acute care hospital setting. The literature was aligned with the clinical practice question developed for this project. I used inclusion and exclusion criteria to ensure that the quality of the evidence was high and that the fall prevention interventions demonstrated fall reduction in similar settings to the project hospital. Authors of studies included for review focused on risks factors associated with falling and clearly listed these risk factors in the articles; authors also identified fall prevention strategies in the acute care hospital setting that were implemented and resulted in a decreased number of falls on medical-surgical units. Authors of excluded studies did not clearly discuss the interventions or had not implemented the interventions in practice; excluded studies also included duplicate

studies and articles that were not evidence-based. All research was selected and reviewed by one reviewer, me.

The literature databases searched were CINAHL (2010-2019), Medline with Full Text (2010-2019), and the Cochrane Database and Systematic Reviews (2010-2019). The search terms for the literature review for this project were *falls*, *risk factors*, *falls with injury*, *fall prevention strategies*, *hospital falls*, *medical-surgical units*, and combinations of these words. Peer-reviewed journals with a focus on falls and fall prevention strategies in the acute care hospital setting were also searched.

The project did not include any human subjects and did not involve collection of patient identifiers. No patient data were used in the final project. The project was aligned with the Walden University *Manual for Systematic Review* and may benefit nurses, the organization, and patients at risk for falls in an acute care hospital.

Figure 1 is the PRISMA flowchart for the systematic review, which identifies the numbers of articles reviewed in the completion of this project. A total of 542 articles were selected for title and abstract review. Of these articles, 488 were excluded; 53 articles were retained for full-text review. Upon further analysis, seven articles met the inclusion criteria. Table 1 is a summary table of analyzed articles that met the inclusion criteria. In addition, this table shows the evidence used in each article as well as the level of the evidence. To ensure integrity of the evidence, the research was conducted in alignment with the guidelines set forth by the Walden University *Manual for Systematic Review*, and the findings reported are solely based on the evidence.

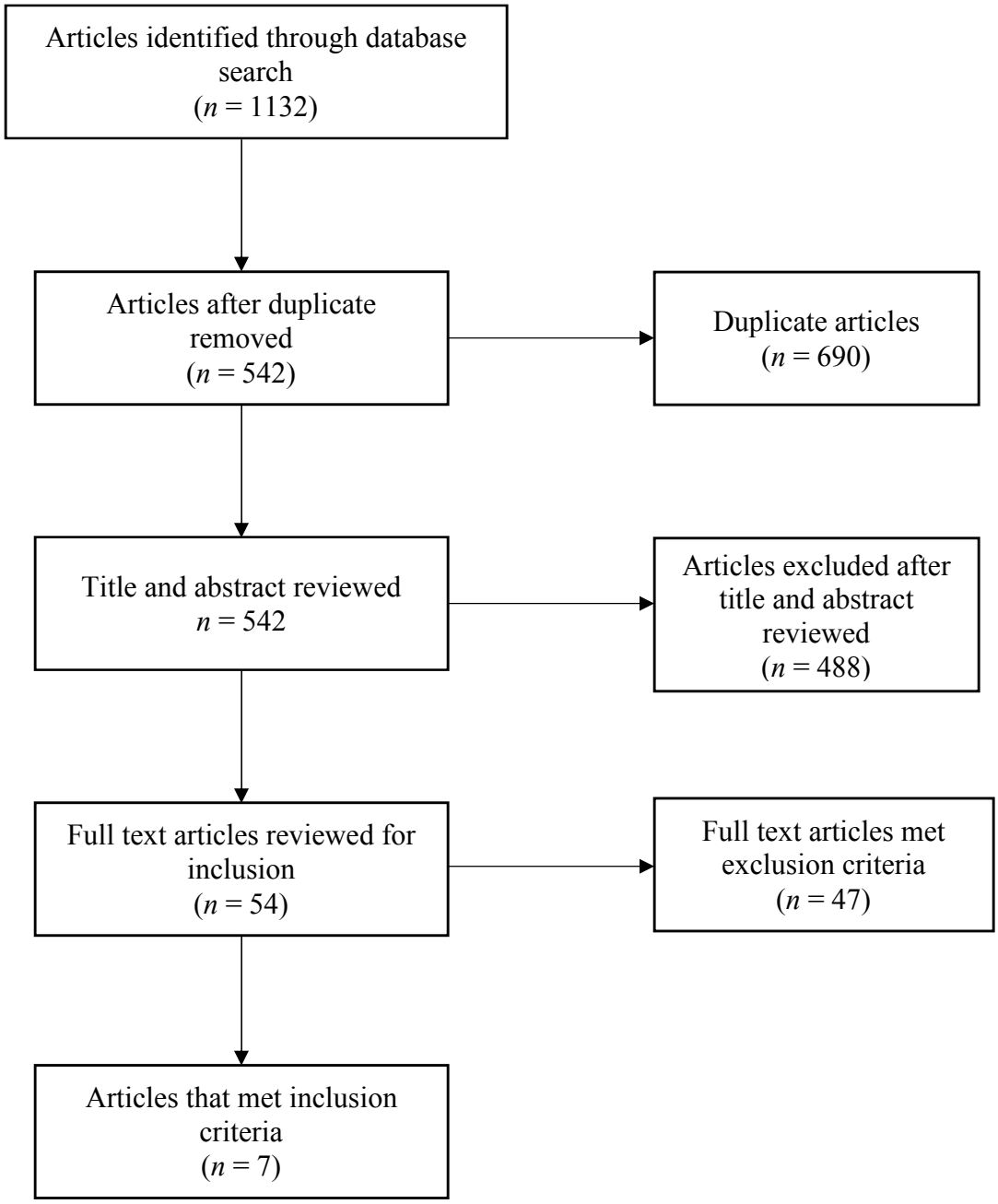

Figure 1. PRISMA flowchart.

Table 1

Summary Table of Analyzed Articles

Citation	Main findings	Research method	Strengths	Weaknesses	Level of evidence
Melin, C. M. (2018). Reducing falls in the inpatient hospital setting. *International Journal of Evidence-Based Healthcare, 16*(1), 25-31. doi:10.1097/XEB.0000000000000115	Staff education in conjunction with ongoing fall risk screening in the use of bed-chair alarm have proven to be important in fall reduction.	A comparison of pre and post intervention data.	A comparison of pre and post intervention data.	1. Large staff turnover during implementation 2. Short intervention period. 3. Project was implemented while another fall prevention intervention was implemented.	I
Dykes, P. C., Carroll, D. L., Hurley, A., Stuart, L., Benoit, A., Chang, F., Meltzer, S., Tsurikova, R., Zuyov, L., & Middleton, B. (2010). Fall prevention in acute care hospitals. *Journal of American Medical Association, 304*(17), 1912-1918. doi:10.1001/jama.2010.1567	Fall prevention tool kit used on medical units in hospitals resulted in a reduced fall rate. Staff education proved to be helpful over short term, but not long term.	Cluster randomized trial.	Study was conducted in multiple hospitals resulting in larger number of participants.	1. The study did not capture falls with injury or repeat falls. 2. The fall prevention tool kit was not effective with younger patients.	II
Godlock, G., Christiansen, M., & Feider, L. (2016). Implementation of an evidence-based patient safety team to prevent falls in inpatient medical units. *MEDSURG Nursing, 25*(1), 17-23. Retrieved from http://medsurgnursing.net/	The use of a fall safety team, staff education, safety huddle and identification of fall risks contributed to a reduction in falls. Effective staff training is important in fall prevention.	Systematic review of the literature. Continuous quality improvement	The use of an interdisciplinary approach The use of simulation in training.	Six months study period was too short The number of participants in the study was too small with n=49.	II

(*table continues*)

Citation	Main findings	Research method	Strengths	Weaknesses	Level of evidence
Ambutas, S., Lamb, K, V., & Quigley. P. (2017). Fall reduction and injury prevention toolkit: Implementation on two medical-surgical units. *Medical Surgical Nursing, 26*(3), 175-197. Retrieved from http://medsurgnursing.net/	Initiating a fall team and implementation of a fall tool kit, in conjunction with leadership support resulted in reduced fall rate.	Systematic literature review with meta-analysis. Continuous quality improvement	Collaborative effort. Use of audits to ensure compliance.	Implementation of this project did not include all the elements of the toolkit. There was no analysis of repeat fallers. Implementation period was too short	I
Coppedge, N., Conner, K., & Se, S. F. (2016). Using a standardized fall prevention tool decreases fall rates. *Nursing 2016, 46*(3), 64-67. doi:10.1097/01.NURSE.0000480616.85167.05	Staff and patient education, with the use of a fall prevention tool, and targeted risk interventions resulted in a decline in falls.	Pilot study	The implementation process was interdisciplinary and standardized. The study time allotted was adequate.	Low study number	III
Titler, M. G., Conlon, P., Reynolds, M. A., Ripley, R., Tsodikov, A., Wilson, D. S., & Montie. M. (2015). The effect of translating research into practice intervention to promote use of evidence-based fall prevention interventions in hospitalized adults: A prospective pre-post implementation study in the U.S. *Applied Nursing Research, 31*(2016), 52-59. doi:10.1016/j.apnr.2015.12.004	Increased use of targeted fall prevention interventions resulted in a decline in falls	Prospective pre and post implementation cohort study	Fall prevention interventions were targeted to the risk factors	Other contributing factors to the decrease in fall rate cannot be ruled out since they may have occurred alongside the study.	III
Quigley, P. A., Barnett, S. D., Bulat, T., & Friedman. Y. (2015). Reducing falls and fall-related injuries in medical-surgical units. *Journal of Nursing Care Quality, 31*(2), 139-145. doi:10.1097/NCQ.0000000000000151	There was a reduction in fall rate, but not in fall with injury	Quality improvement	The use of a complexity level to facilitate operational reports, performance review, and to compare results	A 4-month period for this project was too short for six medical centers.	III

The analysis used in this doctoral project to address the practice-focused question was descriptive. It included data presented in selected studies on fall rates, rate of falls with and without injury, and factors contributing to falls. I combined the descriptive data with the fall intervention information from the related articles producing an overview of the types of interventions that have produced reduction in falls.

Findings and Implications

Several authors of research studies suggested that identification of fall risk factors and implementation of multifactorial interventions to prevent fall have contributed to reduced fall rates on medical-surgical units in acute care hospitals. Melvin (2018) found that a standardized protocol when using bed-chair alarms in patients who are at risk for falls, in conjunction with the Morse falls risk assessment, resulted in a significant decrease in the fall rate on a medical-surgical unit. The postintervention fall rate decreased from 8.67 falls per 1,000 patient days to 5.07 falls per 1,000 patient days, accounting for a 3.6% improvement. Although the postintervention rate was above the national bench mark of 3.92 falls per 1,000 patient days, Melvin (2018) believed that the result was significant enough to support the use of bed/chair alarms as an evidence-based fall prevention intervention.

Dykes et al., (2010) in a cluster randomized study conducted on medical units in four hospitals found that incorporating a fall prevention tool kit such as the Morse falls scale in the health information technology (HIT) system, triggered nurses to complete a fall assessment, that ultimately lead to selecting the appropriate fall prevention intervention for patients found to be at risk for falling. This intervention resulted in a

significant decline in falls, although falls with injury were not significantly affected. The researchers reported a decrease from 4.18 falls per 1,000 patient days to 3.15 falls per 1,000 patient days and concluded that incorporating a fall prevention tool kit can significantly lower the number of falls on medical units in hospitals.

Godlock et al., (2016) conducted a quality improvement project using the FOCUS-PDCA model, on medical units in an acute care hospital. The researchers found that implementation of a safety fall team and staff education resulted in decreased falls among hospitalized patients, reducing the rate from 1.9 falls per 1,000 patient days to 0.69 falls per 1,000 patient days. The safety team used staff education, safety huddles, and identification of fall risks as fall prevention interventions.

Ambutas et al., (2017) implemented a fall toolkit on medical-surgical units in an acute care hospital using the Rush Way continuous quality improvement (CQI) model. The focus was on staff education for fall prevention and leadership support. In addition, an interdisciplinary fall team was developed, environmental changes were made, and patients/families were included in the fall prevention plan. Through a structured evaluation process, it was found that toileting needs of patients strongly correlated with inpatient falls on medical surgical units in the acute care hospitals. Implementation of this project resulted in a 20% improvement in falls and 61% improvement in falls with injury.

Coppedge, Conner, and Fan Se (2016) found that a collaborative approach to fall prevention reduced the rate of falls on medical units in the hospital. In a pilot study conducted by the authors, implementation of a fall prevention intervention tool along

with identification of major risk factors resulted in a reduction in the fall rate from 3.38 to 2.21 falls per 1,000 patient days. The authors stressed the importance of including appropriate education, effective communication, commitment, and use of an adequate tool to positively affect the fall rate on medical units.

Titler et al., (2016) completed a prospective pre-post implementation study in which the researchers used a customized set of interventions to identify specific risk factors, and to decrease or modify these risk factors in patients who were hospitalized on medical surgical units. The outcome was a decrease in the rate of falls from 3.69 to 2.7 falls per 1,000 patient days. Though not statistically significant ($p = 0.09$), the reduction accounted for a 22% decline in the fall rate, and was considered clinically effective (Titler et al., 2016).

According to Quigley, Barnett, and Friedman (2016), falls and falls with injuries on medical surgical units have the highest fall rate of all units in the hospital. Quigley et al., (2016) used staff education, unit-based fall champions, collaboration, and patients' engagement and education, to develop four fall prevention intervention projects that resulted in a decrease in falls on medical surgical units. Falls with injury reflected no major change as the rate was originally low.

Based on the systematic review of the literature, there is a need for fall prevention interventions on medical-surgical units in the acute care hospital setting, especially on medical surgical units. All of the articles reviewed identified the importance of identifying risk factors for falls. Among the risk factors identified were age, toileting needs, and environmental factors. With the exception of Dykes et al., (2010) who found

that fall prevention education was useful in short-term but not over time, there was a consensus that staff education played an important part in fall prevention. Educating staff on fall prevention, bed-chair alarms, and the use of a fall risk assessment scale were the most frequently cited interventions in the analyzed studies. The Morse fall risk assessment scale was the most frequently mentioned risk assessment scale. Other interventions included implementing a fall safety team (Godlock et al., 2016), team collaboration that included patients and families in the prevention of falls (Coppedge et al., 2016); and interdisciplinary collaboration (Ambutas et al., 2017). Leadership involvement was shown throughout the literature to be a positive contributor to successful implementation of fall prevention protocols.

Most of the studies reviewed identified older patients to be at higher risk for falls, and identified interventions as being more aligned with this population. Age was not listed as an inclusion or exclusion criteria for this project, and it was noted that most studies did not capture the younger population, which could result in bias. Dykes et al., (2016) questioned whether tool kits should be used just in older patients, as they are not effective in younger patients.

The summary table of analyzed articles focused on major findings, the research method, strengths and weakness of the studies, and the level of evidence. Findings were mostly similar, but research methods differed. It is important to identify the strengths and weaknesses of a study to facilitate improvement in future studies (Saeed et al., 2018). The level of evidence is of major importance as it provides guidance in selecting appropriate evidence-based interventions to apply in practice (Saeed et al., 2018). As

shown in the summary table, the evidence ranged from level I through level III. Broomfield (2011) stated that it is important that nurses use evidence-based research in making appropriate health care decisions. Saeed et al. (2018) described four levels of evidence of the pyramid, level 1 through IV, with the highest level of evidence being level 1 and the lowest, level IV. The articles that were analyzed included two that were level 1, two were level II, and three were level III. Irrespective of the method used, most of the authors identified staff education and use of a fall prevention tool kit as valuable interventions in preventing falls on medical-surgical units in the acute care hospital setting.

The implications resulting from the findings of this systematic review were that with improved identification of risk factors and implementation of evidence-based fall prevention interventions, patients admitted to acute care hospitals on medical-surgical units can experience better outcomes when it comes to falls. Working together as a team and having leadership support can enhance implementation of appropriate fall prevention protocols. Substantial evidence supported the need for educating staff on fall risk assessments and prevention interventions. In addition, the use of fall risk assessment tools to identify patients at risk for falls was well documented. Adverse outcomes of falls included disability, pain, distress, and sometimes death (Nazarko, 2015) and fear of falling, depression, and anxiety (Wexler and D'Amico, 2015). In addition, hospital falls resulted in major cost to patients, communities, institutions, and overall health systems (Godlock et al., 2016). Thus, a reduction in falls can result in a reduction in associated costs, while improving patients' outcomes. Positive social change can be enhanced in

patients at risk for falls through the development and application of an improved evidence-based protocol, based on the systematic review of the literature. This practice change can also benefit nurses and the organization as a whole.

Recommendations

Although a fall intervention protocol exists at the acute care hospital referred to in this project and a fall risk scale is being used, the fall rate remains high. Based on a systematic review of the literature, it is recommended that the hospital creates an interdisciplinary fall prevention team to work in conjunction with unit fall team champions. These teams and the continued use of the Morse fall risk scale can be implemented on medical-surgical units in the hospital to fill the gap-in-practice. To guide the implementation of an interdisciplinary fall prevention team, the Team Strategies and Tools to Enhance Performance of Patient Safety (TeamSTEPP) approach as described by Godlocxk et al. (2016) can be used to facilitate identification of risk factors for falls and foster application of customized prevention strategies.

The fall prevention team will focus on effective completion of the Morse fall risk scales by staff and identification of appropriate interventions to prevent falls in patients found to be at risk. In addition, the interdisciplinary fall prevention team will analyze factors related to all falls on medical-surgical units, report findings to staff and managers on the units involved, and then develop interventions to prevent further falls. Nursing champions will work on their designated unit to ensure that the fall prevention protocol is being followed appropriately and will help to educate staff as needed.

To implement this project, the existing fall committee members along with nurse managers can be asked to nominate members for the interdisciplinary fall prevention team. Team members should receive training based on the evidence and should be able to demonstrate learning. Likewise, unit-based fall champions will be selected by nurse managers and undergo training. Once the major stakeholders are trained, the project can be introduced to the units and staff can undergo training. All falls must be reported and documented in a database system for easy data retrieval.

Pre-intervention fall data should be collected and compared to post-intervention data after a predetermined time span. This evaluation plan will allow comparison of the rate of falls per 1,000 patient days before and after the practice change.

Strengths and Limitations of the Project

This project was based on a systematic review of the literature using evidence-based research articles to retrieve the best answers to the clinical practice question. In addition, although the number of articles that met inclusion criteria was limited, interventions were similar.

A limited number of articles met the inclusion criteria for the population described. Multiple researchers have identified medical-surgical units as having the greatest number of falls in hospitals, yet evidence-based research regarding prevention strategies were few. Thus, there is a need for further fall prevention studies on medical/surgical units in the acute hospital setting, allowing confirmation of current prevention strategies and/or new evidence-based prevention strategies

Section 5: Dissemination Plan

Introduction

Dissemination of EBP findings is an important step in any evidence-based research study. Forsyth et al., (2010) indicated that disseminating EBP findings to appropriate individuals including stakeholders and other health care professionals is important to facilitate innovations for practice. I plan to present the evidence-based information to administrators and other major stakeholders including nurse managers, educators, and the fall committee at the hospital where the practice-focused question was generated. I will use a PowerPoint presentation to disseminate this work and allow colleagues to provide feedback on the practice improvement project. This work will be disseminated to major stakeholders on the other campuses of the hospital in a similar manner. It is my intent to submit this work for publication in the *MEDSURG Nursing Journal* to draw attention to fall prevention strategies and the need for further studies in this area.

Analysis of Self

As a DNP-prepared nurse, I am guided by the DNP Essentials (AACN, 2006) to assume the role of practitioner, scholar, and project manager. As a practitioner, I can facilitate the transference of evidence to practice and optimize the health and outcomes of patients. As a scholar, I have been prepared at the doctoral level and in alignment with DNP Essential III; as such, I am able to integrate interdisciplinary knowledge, apply knowledge to health promotion, and conduct evidence-based research and apply new findings to complex practice scenarios. As a project manager, my skills are aligned with

DNP Essential II; I can use organizational and systems leadership strategies to optimize patient and health care systems outcomes (AACN, 2006).

This project has been a positive experience in translating evidence into practice. After producing the evidence-based fall prevention systematic review, I have an awareness of how much more I can be involved in fall prevention efforts on medical-surgical units in the acute care hospital setting. In addition, I can express long-term goals to identify areas of practice that need improvement and facilitate such improvement through my role as a practitioner, a scholar, and a project manager.

With the completion of this project, I will have earned the title of DNP. There were challenges in completing this project such as finding appropriate articles and working on a time line. Facilitating social change as it pertains to patients, staff, and the organization as a whole will merit the hard work undertaken in completing this project.

Summary

Falls on medical floors in acute care hospitals are preventable, yet the evidence has shown that falls continue to occur in this setting (AHRQ, 2013). Researchers have identified several fall prevention strategies such as staff education, identification of risks for falls, and use of fall risk assessment tools which, if appropriately implemented, can reduce the fall rates. Although the studies were limited, the findings showed convincing evidence that fall prevention strategies are effective in reducing falls. There is, however, a need for continued research and the development of national standardized guidelines in fall prevention to foster social change for patients, staff members, and health care organizations. When guidelines are applied consistently and universally by appropriately

trained staff led by committed leaders, the number of falls on medical-surgical units in acute care hospital settings can be reduced.

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