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Fall Prevention on the In-Patient Neurological Stroke Unit

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
2023

Abstract

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by

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MS, Walden University, 2011

BS, University of South Carolina Upstate, 2006

Project Submitted in Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

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Abstract

The purpose of this quality improvement (QI) evaluation project was to decrease patient

falls on a neurological stroke unit. This unit had the most falls throughout the hospital

system. The unit averaged 50-60 falls per year with an average of 4.75 falls per month.

Guided by Neumann's system model, the project targeted those patients at the highest

risk for falling related to deficits post-stroke and post-neurological disease process. Staff

were informed about Last fall, Express needs, Awareness of safety, and Frequency of

bowel and bladder (LEAF) to determine if this tool could decrease falls in the

neurological stroke population patients. The LEAF tool was introduced to staff via

instructional modules and PowerPoint presentations over an hour interval, along with

visual aids on fall prevention at staff meetings and unit-based council meetings. The total

number of staff that received instruction on the LEAF tool was N=54. The study was

conducted with a chart review sample size of $N = 1558$. Data were gathered using EPIC

electronic health record database. For the study, inclusion criteria from chart reviews

included Morse fall risk scale scores greater than 65, and National Institute of Health

Stroke Scale (NIHSS) scores greater than 42. Falls decreased by 50% during the 8-week

study. The LEAF tool proved beneficial to the family members by providing them with

an increased sense of safety and security; nursing staff awareness increased surrounding

those at the highest risk of falling; and the patient benefited by being able to have a safe

discharge, a decreased length of stay and no further complications during hospitalization.

Staff engagement and monitoring of those at risk for falling is vital for the sustainment of

fall reduction, a positive social change.

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Dedication

I dedicate this project to my mother who believed in me and was always proud of my accomplishments in life. She never forced me to take a detour in life and she always said that she would be proud of her children even if they were sanitation engineers. She was always there to support me and assure me I stayed the course of my studies. To my children Nyla and Kingston, who were patient and kind as I studied and engaged in my studies. I may have missed a few soccer games, but they remained supportive. And to the love of my life, Carl thank you for always reminding me that "I believe in you". We made it.

Acknowledgments

To my mentor, Veronica Deas who would not allow me to quit. I thank you for making sure all questions were answered and support was provided. And finally, to my project chair, Dr. Margaret Harvey, thanks for your support and willingness to be flexible and encouraging. To Dr. Holly, thanks for the support and encouragement to prevail.

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Section 1: Nature of the Project

Introduction

In this DNP quality project, an article by Veniegas and Case, 2019 provided an assessment of fall prevention on the neurological/stroke unit using the last fall, express needs, awareness of safety, and frequency of bowel and bladder (LEAF) tool. Fall prevention requires a multi-model approach with collaboration among various disciplines. Customizing fall prevention to meet individual's needs would be ideal; however, clinicians tend to use an overall approach to fall prevention that does not meet the individual patient's needs (Ward, 2019). Stroke is one of the major contributing factors of disability, increased falling and as a result, fall prevention becomes a top priority (Huang, et.al., 2016). "Falls are increasingly significant in the stroke population during the acute phase and chronic phase due to the inability to generate adequate joint movements to reverse perturbation induced descent and restore upright stance" (Salot, et. Al., 2016, p.339). I conducted this quality improvement project to decrease the number of falls occurring in the neurological/stroke unit. The LEAF tool is a tool that staff can adapt to the acute care setting. The LEAF tool is used to raise awareness of those at risk for falling. After I implemented this tool, efforts surrounding greater reliability toward fall reduction were used. My goal was to decrease stroke-related disabilities that affect the patient, the family, and the economy. Patient and family satisfaction increased as the focus shifted to stroke patient rehabilitation and safety. After the goal of fall prevention was achieved in the neurological/stroke unit, staff required knowledge and full responsibility for the medical needs of the patient. According to Ruggieri et al., 2017, the

biological needs, the physiological needs, and social needs of the patients are the responsibility of the staff and the patients they care for.

Problem Statement

The purpose of this quality improvement project was to decrease the number of falls occurring on a neurological stroke unit. The project took place in a local acute care facility with over 400 inpatient beds. On the neurological stroke unit, there is a lack of fall prevention interventions that would diminish falls on the neurological stroke unit. Currently, there were no written interventions within the organization that addresses the patient's diagnosis, which could be related to increased falls. Therefore, using the Morse fall risk scale, the National Institute of Health Stroke Scale (NIHSS), and the LEAF tool with neurological stroke patients were used to identify and address the gap in practice. As falls are common after a stroke, these patients are at a 14% higher risk of falling, which will require more effective fall reduction interventions (Weiet. Al., 2019). The LEAF tool is used to focus on deficits of patients on the neurological/stroke unit and their propensity for frequent falls. Each year, approximately 795,000 people in the United States experience a stroke that causes sensorimotor and cognitive deficits that lead to impaired balance control leading to an increased risk of falling (Kannan et al., 2019). Impaired mobility and reduced balance are two main risk factors for falling among community stroke survivors (Weiet. Al., 2019). As a result of poor balance control, 40% to 70% of the stroke population experience a fall annually (Kannan et al., 2019).

Purpose Statement

The purpose of this project was to implement a fall prevention tool that would be tailored to meeting the needs of neurological/stroke patients. The practice focus question

was: Does the LEAF tool reduce falls in setting that provides acute care to older adult patients on the neurological stroke unit? Using a fall prevention tool such as the LEAF too. Improved balance impairments that exist with 83% of stroke survivors (Cortez-Perez et al.2020). Studies show that patients experiencing a stroke or neurological disorder have a 50% chance of suffering from debilitations or mobility issues, which increase fall risk (Ferguson, et. Al., 2016). Due to the debilitation, the need for early ambulation and fall prevention is imperative. As a result of increased balance dysfunctions caused by strokes, implementing psychotherapeutic rehabilitation is a necessary component of fall reduction (Cortez-Perez et al., 2020). Improvement needs to be geared toward the culture of a hospital, implemented into job descriptions, and incorporated in the employment contracts to sustain success (Hillet al., 2018). The lack of nursing knowledge related to adequate Morse fall risk scale fall risk scores and appropriate National Institute of Health Stroke Scale (NIHSS) scores has also been a missed opportunity on admission and when assessing patients admitted to this unit.

The neurological stroke unit is a 28-bed neurological unit with 63 dedicated staff members. There is a team of four neurosurgeons and two advance practice registered nurses (APRNs). The LEAF tool could be used by staff to improve fall prevention. Neurological/stroke patients experience deficits in mobility and sensory impairment. Studies show that cognitive impairments impact patients' functional ability, balance, and coordination (Hamm, 2016). Nonadherence to evidence-based fall prevention bundle elements is also a relevant gap in practice organizational-wide. The neurological/stroke unit averages 34 falls annually. For the fiscal year 2018, the unit had 34 falls with 13 of those with injury. For the fiscal year 2019, there were 48 falls and seven with injury.

Typically, the unit sends 34 to 35 All Hands-on Occurrence reports monthly and an average of 410 annually. By using the LEAF tool and monitoring National Institute of Health Stroke Scale (NIHSS) and Morse fall risk scale (Majkusova & Jarosova, 2017) scores, this unit can be successful with fall reduction.

Addressing the gap in practice will require implementing the LEAF tool to tackle a long-standing issue with inpatient falls. Falls are currently the most frequently reported adverse event occurring in healthcare facilities and should be a provision of safe care using effective fall prevention strategies (Majkusova & Jarosova, 2017). Stroke is the leading cause of disability in adults according to (Centers for Disease Control, 2016), addressing the gap in practice is important when addressing fall prevention.

Nature of the Doctoral Project

I found sources of evidence for this project in CINHAL, Medline, Science Direct, Pro-Quest, and EBSCO. Key search terms that I used were: *LEAF,* National Institute of Health Stroke Scale *(NIHSS), fall prevention, stroke patients, neurological patients, debilitation, fall prevention in stroke patients,* and *post-stroke*. I conducted the search for the years 2015 to 2021. I identified a comprehensive list of articles through this search. I excluded research articles that were not current or relevant to best practices from the literature review.

The LEAF tool is used to focus on fall reduction by identifying necessary patient needs and their risk for falls. Using the Morse fall risk scale provides a score that predicts those patients at highest risk for fall. In return implementation of the LEAF tool targets those patients, provides early interventions, and prevents them for experiencing inpatient falls. Data used for gathering research was done with great detail in efforts to

prevent skewing (Grove, et. Al., 2013). The Morse fall risk scale is currently used to provide a synopsis of the patient's risk for falls. The Morse fall risk scale tool focuses on six subscales that result in a score when filled out by the nursing staff. The areas of assessment are fall history, intravenous access or heplock, secondary diagnosis, ambulatory aid, gait, and mental status (Agency for Healthcare Research and Quality, 2017).

The LEAF tool was used to evaluate the efficacy and adherence to the guidelines set forth by the tool on the neurological stroke unit by the staff. Using the electronic medical record, the fall risk scores collected determined the total number of high-risk fall scores on the neurological stroke unit. The fall risk score was completed by a registered nurse on the unit for all the inpatients on the neurological/stroke unit upon admission or transfer to the unit and each 12-hour shift. The Morse fall risk scale (Majkusova & Jarosova, 2017) indicates the risk of falling. This tool was used to evaluate the fall risk by focusing on six subscales that result in a score ranging from 20 to 100. Information came from the electronic health record. The fall rate per patient day was provided by the risk manager. This team consist of primary nurses and a data analyst. There is one director of risk management, one patient safety manager, one risk manager, two claims' adjusters, one risk analyst registered nurse, and three risk analysts. A registered nurse on the unit on admission and each 12-hour shift completed the National Institute of Health Stroke Scale (NIHSS). The National Institute of Health Stroke Scale (NIHSS) focuses on 11 subscales which are: level of consciousness, best gaze, visual, facial palsy, motor arm, motor leg, limb ataxia, sensory, best language, dysarthria, and extinction and inattention (Sabeo, 2017).

The inclusion criteria were Morse fall risk scale scores greater than 65 on a scale of 0 to 100 and National Institute of Health Stroke Scale (NIHSS) scores greater than 42 on a scale of 0 to 42. The LEAF tool was used to compare the patient's Morse fall risk scale score and their National Institute of Health Stroke Scale (NIHSS)) score as variables. The Morse fall risk scale scores and National Institute of Health Stroke Scale (NIHSS) scores were collected on admission to the unit and 2 weeks post-admission.

I used SPSS software statistics 28, (IBM, 2021) to determine statistical analysis. Using the LEAF tool resulted in identified trends that were present with the falls occurring on the unit and provided the necessary interventions. This information was kept in a Microsoft Excel database by risk management. The data yielded variances in the correlation between high Morse fall risk scale scores and high National Institute of Health Stroke Scale (NIHSS) scores to patient falls on this unit. Staff were allowed to discuss their thoughts during staff meetings, unit rounds and via email because the evidence supported multifactorial, interdisciplinary practice changes which did yield a reduction in fall rates, and according to Quigley, 2016, with the use of adequate resources to support practice changes fall reduction can occur.

Significance

Falling is one of the most common complications of stroke patients with fractures occurring in 23 to 50% of those patients that fall (Cho, et. Al., 2015). Fostering a good nurse-client relationship can provide sustainability and good results from the LEAF project. Falls are the second leading cause of accidental deaths in the United States (Centers for Disease Control, 2016). Effective communication and collaboration among stakeholders are important in preventing variation and fostering staff engagement. The

stakeholders benefiting from the LEAF tool were the staff on the unit, the patients, the

unit-based council, the hospital's institutional review board, the local community, the

therapy department, the physicians, the nursing assistants, and the family. Root causes of

falls can propose a challenge for all involved.

Using the LEAF tool may benefit potential stakeholders such as the family

members by providing them with an increased sense of safety and security. The patient

would benefit from improved quality of care and safety as well as fall reduction in the

inpatient setting. The neurological stroke unit would benefit from the LEAF tool because

it would aid in fall reduction and decreasing in patient harm. Falls are one of the most

frequently reported adverse events occurring in healthcare facilities that constitute a

problem for patients and families (Majkusova & Jarosova, 2017).

Providing patient-centered care is the focus of this hospital system. This quality

improvement project can facilitate a nurse-client relationship focused on patient quality

and safety. The cost of one single fall with an injury can range from $30,000 or above per

occurrence, and it is expected that the annual cost of falls will reach over 54.9 billion

dollars (Centers for Disease Control, 2016).

Summary

Implementing a fall prevention tool such as the LEAF tool has the potential to

identify those at risk for falls and decrease falls (Majkusova and Jarosova, 2017).

Addressing the gap in practice and how nursing contributions can close current gaps in

practice has been the focus of section one. The LEAF tool is used to identify those

patients at highest risk for falling and to monitor contributing factors related to falls in the

inpatient setting.

In Section 2, I will discuss the concepts, models, theories, and the local background for the LEAF tool. I will also discuss how the LEAF project can be used to promote a safe environment to provide quality care.

Section 2: Background and Context

Introduction

The question that I asked in this project was: Will the use of the Last fall, Express needs, Awareness of safety, and Frequency of bowel and bladder (LEAF) tool decrease falls in the neurological stroke population in neurological/stroke patients over 8 weeks? My focus for this DNP project was decreasing falls in the neurological/stroke unit by using the LEAF tool. The quality improvement project incorporated the aspects of the LEAF tool resulting in increased patient safety, promoted a sense of security, decreased patient falls, and increased patient knowledge of fall prevention.

Concepts, Models, and Theories

I chose Neumann's system model as the groundwork of this DNP project. Neumann's system model views individuals as a system. It is a model that facilitates optimal levels of stability for each client system (Fawcett, 2017). When patients can interact with their system, the system remains balanced without stressors involved. Otherwise, the systems become imbalanced when the client and environmental interaction is absent (Pattaramongkolrit, et. Al., 2015).

Teaching primary prevention intervention to client systems and the family may prevent falls (Fawcett, 2017). The number of older people is projected to increase from 43.1 million in 2012 to 83.7 million by 2050 (Fawcett, 2017). With the aging population, using Neumann's system to identify what contributes to longevity and what clinicians can implement to prevent falls in the acute care setting can serve as a guide to identify physiological stressors (Fawcett. 2017).

The use of a multisystemic model would potentially aid in the design of the fall prevention innovation. Multisystemic models focus on evaluating the effectiveness of interventions, determining characteristics that can help facilitate underlying mechanisms toward fall prevention, and developing a hypothesis-generating multi-systemic model for senior leaders to sustain fall prevention programs (Choi, et. Al., 2011). According to Fawcett, 2017, some physiological and developmental intrapersonal stressors occur in the older adult such as diminished vision, strength, balance, and motor coordination, which contribute to increased falls. Neumann's model can serve as a guide for the DNP-prepared nurse to focus on the disease processes that relate to functionality.

The Behavioral change theory (Li, et. Al., 2021) can be applied to fall reduction in the neurological/stroke acute care population. The methodology and findings of the Behavioral change theory coincides with the LEAF tool project. The Behavioral change theory reduced falls by using behavior change techniques. To make an impact on behaviors, a thorough understanding of the Behavioral change theory is necessary. By implementing the Behavioral change theory into current practice, I hoped to engage the patients to the point where they would accept the interventions provided, embrace the content, and perceive the LEAF project as an ongoing effort to improve their quality of life. Working with the older population and those at risk for falling requires strengthening and effective ways to reduce falls. Physical activity has been known to play a part in health behaviors and the health of individuals according to (Fleig, et. al., 2015). Interventions are necessary for health-related changes in correlation to the Behavioral change theory ; human behaviors play a key role in many leading causes of death (Davis, et.al., 2015).

Incorporating the behavioral change theory into the LEAF project provided the basis for determining if unsuccessful interventions had failed due to no effect upon the hypothesized mediator or because the hypothesized mediator did not affect behavior. Davis, et. Al., 2015 recommends facilitating more efficient refinement of the intervention if no behavior change occurred. The LEAF project focused on the Behavior Change Theory which changed the behavior of the nursing staff on neurological stroke unit to continue to incorporate fall reduction in the current patient population.

When focusing on the relevance to nursing practice using the LEAF tool, neurological stroke patients are deemed at-risk population because some suffer from paralysis, sensory, perceptual, and cognitive deficits that limit their activity (Cawood, 2016). Assessing and understanding the impact of impairments on activities and participation are necessary to plan optimal interventions focused on modifying these impairments (Cawood, 2016). Studies show that those patients that suffered from strokes have increased impairments (Cawood, 2016) including bowel and bladder incontinence that can yield a negative impact on the functional independence of those stroke survivors with additional deficits in the physical and social aspects of life (Kariyawasam, et.al., 2020).

Protecting every patient from harm is one of the organization's major foci. As the organization worked toward achieving zero harm, determining the effectiveness of any fall prevention program became a part of this quality improvement project focus. Implementing projects that are purposeful and sustain positive social change are reflective of Walden's mission.

Relevance to Nursing Practice

Current literature revealed that the fall rate of stroke patients requiring

hospitalization is 89 to 178 per 10,000 patients daily requiring appropriate fall risk

assessments (Itoh, et. Al., 2022). The neurological stroke unit held the highest fall rate

throughout the organization thus supporting the need to implement a fall reduction tool.

Stroke is very common, and it is one of the major public health threats affecting up to

800,000 Americans whom 70% of those experience a fall annually (Yang, et. Al, 2020).

Fall prevention measures warrant complex interventions and collaboration of all

disciplines involved in the patient's care in order to provide optimal outcomes.

Currently the unit does not have a fall prevention tool in place due to the loss of

the fall prevention team several years ago when the hospital system merged with another

entity. With neurological stroke patients, the risk of falls is significant, and falls are

associated with various injuries, decreased physical activity, poor functional limitations,

and increased fear of falling (Fiedorova, 2022). My research of literature recommended

that identification of risk factors should be addressed via interventions and on multiple

levels (Fiedorova, et. Al., 2022). The percent of neurological stroke patients that regain

the ability to ambulate is 39 to 90% which warrants inspection of current fall prevention

programs and their ability to reduce falls in the post-acute care setting (Yang et. Al,

2021). Literature shows that the use of the LEAF program can reduce the use of restraints

(Primaris, 2006). Health promotion and health prevention programs are recommended to

address the factors influencing health-seeking behaviors and to educate the community

surrounding neurological stroke patients and the effects that may occur (Mkhize, et. Al.,

2022).

Strategies to address the gaps in practice include assessing all new admissions, transfers, and those returning to the unit from procedures by the registered nurse each 12-hour shift. The LEAF tool required nursing staff to assess the targeted patient population for fall risk and intervene as necessary because of the patient's Morse fall risk score. Using the LEAF tool in the neurological stroke unit provided provisions for increased fall prevention measures and decreased falls on the perspective unit. In the past, the unit monitored fall scores and trends of fall occurrences. The hospital's fall prevention team met monthly to provide the data and discuss what interventions were necessary according to each perspective fall. Those interventions were not sustained due to the team becoming nonexistent.

When focused on addressing the gap in practice, the aspects of the LEAF program allowed nursing staff to assess fall risk levels by utilizing the National Institute of Health Stroke Scale (NIHSS) and Morse fall risk scores to determine the risk of falls in the neurological/stroke population. These patients were chosen by their National Stroke Institute Stroke Scale (NIHSS) score and Morse fall risk score. In the past, there was not a focus on the stroke scores which play a great part in the patient's function and can contribute to increased falls.

Local Background

Fall prevention must be addressed at the community and population levels (Hoke & Guarrachino, 2016). An identified local gap in nursing practice within this organization where the project was implemented was increased falls on the neurological stroke units. Fall reduction and prevention is not only a local problem at the facility, but it is also a global issue that is the main foci for neurological stroke units. Being predisposed to

multiple comorbidities and a high risk for falling makes this patient population a major safety concern. Fall prevention has long posed a challenge for health care providers and continues to be one of the top adverse safety events in this local hospital (Hoke & Guarrachino, 2016).

The local facility had suffered from increased falls, which impacted the facility's rate of reported falls and deaths from falls. The facility benefited from the LEAF tool because it promoted decreasing patient falls in the acute care setting, increased hospital scores, and improved patient satisfaction scores. Decreasing falls also facilitated increases in revenue and reimbursement from Medicare and Medicaid. Locally, the staff at the facility had struggled with increasing numbers of stroke patients who had experienced falls. The implementation of the project benefited the facility by decreasing falls and closing the gap in practice at the clinical site. Additionally, the patients and their family benefited from the use of the LEAF tool in the inpatient setting because it provided them with a sense of safety for their family member. The fall prevention program served as a way to deal with the neurological deficits experienced by their loved ones and kept them safe. Stroke patients benefit more from inpatient rehabilitation versus those that go to a skilled facility because the care is specialized to that patient's needs and most of the recovery takes place within the first 3 months post-stroke (Wong, et. Al, 2016).

Role of the DNP Student

As a past clinical practice specialist serving on the quality team, it was my duty to ensure that all aspects of patient harm prevention were implemented throughout the system. This project aligns with DNP essential VII: Clinical prevention and population

health for improving the nations' health (AACN, 2006). This essential is geared toward improving population health by utilizing evidence-based fall prevention measures to assess for environmental data and evaluation of clinical prevention (Decapua, 2017). As a scholar-practitioner, I was inspired to implement a project that decreased patient falls and sustained the quality of life in the acute care facility.

Establishing relationships with the unit staff, the nurse manager, and the unit-based council facilitated the implementation of the LEAF project. The LEAF project was implemented on this unit with the help and engagement of the unit-based council, the nurse management team, and fall champions. The team members were engaged in making a difference in their unit and with the focus of reducing falls because they have had the most falls out of each inpatient unit in the hospital system. Having zero harm has been my goal for the last four years while serving on the quality team. Connecting to purpose has motivated me to implement a project that helped meet the goal of zero harm in the organization. Seeing the harm reduction was inspirational to me.

Summary

Implementing a fall prevention tool such as the LEAF tool has the potential to identify those at risk for falls and decrease falls (Majkusova & Jarosova, 2017). This section identified the gap in practice, local background, and role of the DNP students. Section three shifted to the sources of evidence, the plan for implementation, and the continued discussion of the background and context of the DNP LEAF project. Search terms used to find current evidence-based literature was also discussed.

Section 3: Collection and Analysis of Evidence

Introduction

Sustaining a program that prevented falls in the neurological/ stroke unit was an important milestone in fall prevention. The purpose of this project was to decrease patient falls in an acute care hospital's stroke floor by implementing the LEAF tool. Engaging staff and various stakeholders in the project were important factors for implementation and sustainability. Section 3, focused on sources of evidence, analysis and synthesis of the data, and evidence generated for the project.

Practice Focused Question

The question that I asked in this project was: Will the use of the Last fall, Express needs, Awareness of safety, and Frequency of bowel and bladder (LEAF) tool decrease falls in the neurological stroke population in neurological/stroke patients over 8 weeks? Evidence-based practices supported the need for improving and implementing fall prevention measures in the neurological stroke population.

An identified local problem in nursing practice within the organization was increased falls on the neurological stroke unit. These residents were identified as the population most at risk for falls and injuries using an incident reporting system. Understanding why these patients fell more than other populations was key to identify the cause of the falls, and ultimately formed the gap in practice.

Operational definitions include a *fall*, which is defined as an event which results in a person coming to rest inadvertently on a lower level, (Kyoung, et. Al., 2021). When this happens without warning, the individual can be harmed, especially those who are compromised by illness or age. The LEAF tool places emphasis on those patients at highest risk for falling and may require identifying contributing factors and or trends

related to increased fall risk. The tool can also be used to focus on areas of higher reliability related to falls.

Sources of Evidence

Older adults have a great fear of falling because as they age, loss of balance and not being able to self-correct themselves when experiencing a fall occurs (Mackay, et. Al., 2022). Studies reveal that some factors related to fear of falling include sociodemographic, physical, psychological, and environmental factors (Mackay, et. Al. 2022). The LEAF tool was used in studies that identified those patients at highest risk for falling (Veniegas et. Al., 2019). Scores ranged from 0 to 20 with the higher scores representing those patients at highest risk for falling. The mean percent prevalence of the LEAF tool fall risk score was 83. There was a positive association between high fall scores and the use of the LEAF tool to identify those at highest risk of falling.

Neurological stroke units tend to have the most falls within the hospital system (Inacio, et. Al., 2021). Most stroke units average around 50 falls per fiscal year, while a hospital system can average 600 falls or more, annually. While fall prevention remains a top priority, falls remain a top cause of decreased quality of life, increasing the need for aged care services, hospitalized injuries and death associated with injury from falls (Inacio, et. Al., 2021).

Research revealed that stroke survivors experience fall rates on average of 12 to 39% in the inpatient setting and 73 to 80% in the community setting, with high susceptibility to physical injuries (Liu & Ng, 2019). Accidental falls in hospitals are considered serious events with the goal at hand to preserve the autonomy and independence of those patients at risk for falls (Soto, et. Al. 2021).

The LEAF tool was developed by Carolyn Spardin, a registered nurse (Veniegas et. Al., 2019). The tool places emphasis on patients at high risk for falling and monitors contributing factors to fall occurrences. The purpose of the LEAF tool evaluation was to identify those patients at highest risk for falling and implement a tool that would decrease falls on that unit. According to Ainuddin, et. Al, 2021, falls are considered a long term complication post stroke and impairs physical, cognitive and psychological aspects of the patient.

Evidenced-based literature suggests that patients identified as a risk for falls by using an assessment tool are 21% less likely to fall (Zhao, et. Al., 2020). In a study using an acute rehabilitation facility, the acute rehab team used toileting the patient two times on day shift, two times on evening shift and two times on night shift by informing them that it was time to use the bathroom instead of asking them if they needed to use the toilet, resulting in a 50% decrease in falls.(Swenson, et.al., 2019). Most inpatient acute care hospitals average three to eight falls per 1,000 patient days with a rate of 0.4 to 0.69 injuries per 1,000 patient days (Hoke & Gurrachino, 2016). When expanding fall prevention across the span of health care, we must consider different learning principles and the variety of delivery operations available to expand the information. Despite extensive knowledge of intrinsic and physiological risk factors, there are some modifiable factors which may aide in creating more effective fall prevention interventions (Turnen, 2022).

The use of the LEAF tool consistently revealed that it was positive in fall Reduction by reducing falls to a 50% occurrence. Accidental falls contribute to increased mobility, increased pressure on hospital capacity and costly services which propose a

burden on inpatient services according to Ibrahim and AlAsoomi (2021). The Joint

Commission rates falls as number six among patient safety goals with the fall rate

averaging 3 to 5% in U.S. hospital systems (Kim, et. Al, 2021).

Inpatient falls occur more frequently than catheter-associated urinary tract

infections and central-line-associated bloodstream infections and cost an average of

$1,586 for a fall without injury, $9,995 for a fall with a minor injury, and $24,249 for a

fall with major injury (Hoke & Guarrachino, 2016). Redesigning an approach for fall

prevention in the neurological/stroke unit will involve the way the screening process for

fall risk, a more detailed focus on preventable falls, and a detailed history and

interventions that are patient-centered (Quigley, 2016). Clinicians should also base fall

prevention interventions on the location of the patient's deficits. Since falls are noted as

one of the most frequently occurring events in the hospital system, having an appropriate

fall prevention tool is important regarding patient safety (Kim, et. Al, 2021). By using the

LEAF tool, injuries from falls were decreased, hospital length of stay decreased, and

social care systems improved allowing the nurse to focus on patient safety and fall

preventative measures (Newkirk, et. Al, 2022).

Statistical analysis revealed that the use of the LEAF tool decreased falls on the

neurological stroke unit within the 8-week period of review. Hospital falls impose a

greater challenge for healthcare organizations because they affect quality of life (Soto, et.

A., 2021). The goal of the LEAF tool was to determine if it was effective in fall reduction

and results revealed that it is an effective tool. Walden University's mission statement

focuses on connectivity, promotion, facilitation, and supporting collaboration among

partners, research, and projects (Walden University, 2019). The use of the LEAF tool mirrors the university's mission.

Falls continue to be one of the top nurse-sensitive indicators and preventing falls and related injuries is key to delivering high-quality care when we implement processes such as hourly rounding and routine toileting evidence shows that falls are decreased. Clinicians working in the acute care setting react with the first thought that being "what could I have done to prevent this fall?" A patient that is injured due to a fall during their hospital stay represents a quintessential violation of our Hippocratic oath: "first to not harm" (Swenson, et. Al., 2019).

The neurological stroke population is at higher risk of falling due to impaired mobility, impaired cognition, and impaired gait (Cho,et. Al., 2015). Stroke is one of the major contributing factors of disability, increased falling and, as a result, fall prevention becomes a top priority in these facilities (Huang, et. Al., 2016). According to Salot, et.al., 2016, 339, "falls are increasingly significant in the stroke population during the acute and chronic phase due to the inability to generate adequate joint movements to reverse perturbation induced downward descent and restore upright stance." In a study conducted with 161 geriatric stroke patients, 39% experienced a fall within 3 months of admission to the stroke unit with a total of 153 falls in the 3-month period (which involved some repeat falls), and an incidence rate of 15.9% per 1,000 patient days (Quigley, 2016). Some other contributing factors to falls in the stroke population conducted on the 161 patients that were admitted to a geriatric rehabilitation stroke unit, were decreased muscle tone, which accounted for 70% of the stroke patients, paralysis which accounted for 54% of the stroke patients, communication which accounted for

29% of the stroke patients, hemianopia or blindness accounted for 21%, and visuospatial

agnosia accounted for 18% (Quigley, 2016).

This evidence-based literature supports the gap of practice of decreasing the

number of preventable falls at the before stated facility. Analysis of the evidence has

demonstrated that the risk on neurological units for falls and that action must be taken in

order to decrease these falls.

Databases and Search and Key Terms

The databases used to retrieve the evidence were Journal @OVID, Social Sciences

Citation Index, CINAHL & MEDLINE combined, SAGE, American Psychiatric Nursing

Association, and BMC medical ethics. Additionally, Google Scholar was also reviewed.

Some locally used key terms for understanding this doctoral project were:

- *Morse fall risk scale*: This scale gives a score that determines a patient's
  risk for falling. The Morse fall risk scale focuses on six subscales that
  result in a score when filled out by the nursing staff. (Agency for
  Healthcare Research and Quality, 2017).

- *National Institute of Health Stroke Scale (NIHSS):*. The National Institute
  of Health Stroke Scale focuses on eleven subscales which are: level of
  consciousness, best gaze, visual, facial palsy, motor arm, motor leg, limb
  ataxia, sensory, best language, dysarthria, and extinction and inattention
  (Sabeo, 2017).

- *National Database Nursing Quality Indicators (NDNQI): This* – is a
  system that measures nursing quality and benchmarks among like
  facilities on their performance measures (Kariyawasam, et. Al., 2020).

The research collected included the use scholarly articles dated 2016 through 2022. The data collected was the Fall Risk Score and National Institute of Health Stroke Scale (NIHSS) score. Data collection was used for these patients scoring 1 to 42 on the National Institute Stroke Scale (NIHSS) and or 15 to 100 on the fall risk scale. This quantitative project focused strictly on data collection and analysis.

Summary

In Section 3 evidence-based literature pertaining to the subject was discussed and analyzed and the relation to the practice-focused question. Databases, search engines, search terms, that produce the evidence-based literature are discussed in this section. In Section 4 the project's findings and implications were discussed, along with recommendations on how the results of this project made available to other avenues of the nursing profession.

Section 4: Findings and Recommendation

Introduction

Falls are the most frequently reported incident among hospitalized patients, with statistics revealing that three million older people are treated in the emergency room for fall-related injuries (Centers for Disease Control, 2016). An identified local gap in nursing practice was increased falls in the neurological stroke unit. The unit averaged 57 falls per fiscal year with 4.75 falls per month. Fall reduction and prevention is a global issue and one of the main foci for the neurological stroke unit. Being predisposed to multiple comorbidities and a high risk for falling makes this patient population a significant safety concern. Fall prevention has long posed a challenge for health care providers and continues to be one of the top adverse safety focuses for local hospitals. This quality improvement project aimed to decrease falls using the LEAF tool to increase patient safety by reducing patient falls and increasing knowledge of fall prevention. The question that I asked in this project was: Will the use of the Last fall, Express needs, Awareness of safety, and Frequency of bowel and bladder (LEAF) tool decrease falls in the neurological stroke population in neurological/stroke patients over 8 weeks? The data collection process began after obtaining IRB approval from Walden University and the current site.

Sources of Evidence

The evidence-based literature was obtained using the databases of Journal @OVID, Social Sciences Citation Index, CINAHL & MEDLINE combined, SAGE, American Psychiatric Nursing Association, and BMC medical ethics. SPSS software statistics 28 (IBM, 2021) for statistical analysis of the project data. Use of the LEAF tool

indicated trends with the falls occurring in the unit and provided the necessary interventions. This information was kept in a Microsoft excel database by risk management. The data yield variances in the correlation between high Morse fall risk scale scores and high National Institute of Health Stroke Scale (NIHSS) scores for patient falls in this unit. Staff discussed their thoughts during staff meetings, unit rounds, and via email because the evidence supported multifactorial, interdisciplinary practice changes, which did yield a reduction in fall rates. With the use of adequate resources to support practice changes fall reduction can occur (Quigley, 2016).

Findings and Implications

This quality project focused strictly on data collection and analysis. No human subject intervention required. The unit was composed of 28 beds analyzed daily for 8 weeks. There were a total of 1,558 data collection analyses. Of the 1,558 data entries, two falls occurred during the 8-week course of study. The total number of data collection entries was determined by the number of data charts that met criteria for that day of data gathering. Information for the project was came from the EPIC database charting system. After using the LEAF tool and its effectiveness, the unit decreased inpatient falls by 50%. Evidence-based practice proved that using the tool effectively impacted fall reduction in the neurological stroke unit. The results are noted in the following charts.

Table 1

Falls Per Week

Week in Review	Number of Patients Assessed for fall risk	Number of Falls	Percent of Falls
One	196	0	0
Two	193	0	0
Three	196	0	0
Four	194	0	0
Five	196	0	0
Six	196	1	2.34%
Seven	192	0	0
Eight	195	1	3.1%

Table 2

LEAF Tool Use, National Institute Health Stroke Scale (NIHSS) Scores, Fall Risk Analysis

Patients with LEAF Tool being used	# Patients assessed	Range 0-42 (National Institute of Health Stroke Scale (NIHSS)/ 0-100 Fall risk score	#Patients identified as high risk by Fall risk score
86	196	Average (National Institute of Health Stroke Scale (NIHSS)-20	78
85	193	Average (National Institute of Health Stroke Scale (NIHSS)-15	80
89	196	Average (National Institute of Health Stroke Scale (NIHSS)-18	84

82	194	Average (National Institute of Health Stroke Scale (NIHSS)-12	79
87	196	Average (National Institute of Health Stroke Scale (NIHSS)-10	81
93	196	Average (National Institute of Health Stroke Scale (NIHSS)-15	90
88	192	Average (National Institute of Health Stroke Scale (NIHSS)-20	84
95	195	Average (National Institute of Health Stroke Scale (NIHSS)-0	88

Implications

The result of this project has implications for patients, whose safety is paramount and should be assured in an inpatient setting. The family of the patients should feel comfortable knowing that a system is in place to ensure their loved one's prevention of a fall, which could be devastating. The facility will benefit from having fewer patients experience a fall, which could adversely impact their finances and reputation in the community.

This project supports not only the patients and their families, the community, and the facility, but also it as potential implications for a positive social change. The nursing profession should be a leader in advocating for changes in patient care. This project reflects that and what can happen when nurses work together for the good of those they care for.

Recommendations

Reinforcing fall prevention in the acute care setting provided the staff with the ability to provide quality patient care and a safe environment. By using the LEAF tool, the team can provide more direct contact with the patients and anticipate needs such as toileting and keeping items within the arm's reach. The plan is to use the LEAF tool in other high-risk fall units to decrease falls in the acute care setting for future projects. Using best practices and evidence-based practices will improve quality project implementation throughout the hospital system. Ensuring a valuable tool within the organization is vital to sustaining the fall prevention goals. Providing ongoing fall prevention measures and education to the staff, family, and patients is essential concerning social change. The LEAF tool can be adapted in long-term care facilities and

other rehabilitation facilities as we target ongoing issues of inpatient falls. My goal was to identify the effectiveness of the LEAF tool and explain the rationale for continued use and efficacy in the neurological stroke unit by identifying those at the highest risk for falling and implementing the tool.

Strengths and Limitations of the Project

Strengths of the project include staff engagement and participation in the project. The director of quality for the campus was instrumental providing any necessary data necessary to properly conduct the project. Having access to the unit was another strength of the project, as was the fact that were no participants who started the project and did not finish it. Moving forward in the inpatient setting, the LEAF tool could be used on other units to decrease falls and improve the quality of patient care. Taking a multidisciplinary approach will be vital to sustaining fall prevention in the acute care setting and improving the safety for patients.

Limitations of the project included the fact that when collecting data, the stroke population present was limited. Of the 1558 data collection entries, only 12% of the total patients on the unit were diagnosed with stroke. However, some diagnoses included other types of neurological deficits, which also qualified the use of the LEAF tool. An additional limitation was the small group of participants and the short time frame the project was undertaken.

Summary

This project goal implemented a tool to help the high-risk fall population decrease falls in the inpatient setting. This unit was the focus because it led the organization in the most inpatient fall occurrences. In this section, the findings, limitations, and strengths of

the project are discussed. In Section 5, project dissemination and self-analysis were

discussed.

Section 5: Dissemination Plan

The plan to disseminate the project across the health care continuum is a key responsibility of my DNP scholar role. The project goals and findings were discussed at upcoming meetings at the facility. The audience are all nursing staff within the organization, the unit managers and the administrative staff. The project goals are presented at semiannual skill checkoffs for nursing staff, unit-based council meetings, and staff meetings.

Another opportunity to share the results of the project will be at poster presentations at various conferences, especially those which focus on the care of neurologically deficient patents. Discussing the project results with other nurses and looking for additional opportunities to share the results will also be key.

Analysis of Self

As I reflect upon my DNP project, it gives me great pleasure in knowing that the LEAF tool was successful in fall prevention in the acute care setting. Both patience and endurance to stay the course was vital in completing the project.

As a scholar, throughout my course of study, I was met with challenges. When I begin the program, the hospital system utilized the Cerner database for documentation and patient information. By the time that I concluded my study, the hospital system had switched to the EPIC charting system. This added a small learning curve because I had to learn a new charting system to collect my data.

As a clinician, most rewarding is the fact that the safety of inpatients has been successful on a unit that has always led the fall occurrences throughout the hospital

system. Since the implementation of the project, the facility has adopted the methods for ensuring patient safety that was described in this manuscript.

As a leader, I became a mentor for the unit and a change agent for my organization. I learned how to communicate with the organization more succinctly and to led the participants in completing the project successfully.

Challenges to the completion of the project were a change in the charting method at the facility, the short length of time of the project, and the small sample size that made it important to ensure all who started with the project, completed it. Challenges identified, and solutions ensure the project's success.

Summary

Being able to identify patients that have been deemed high risk for falling provides a sense of positive change in their quality of care. The identified gap in practice was a lack of fall prevention tools and stakeholder engagement in fall prevention. As a result, the LEAF tool was used with a reduction in falls in the neuroscience unit. Falls were decreased by 50% on average per month with my project. The LEAF tool provided a means for managing falls, which according to Hill, etl.al., 2018, are the second leading cause of death worldwide. Bridging the gap between inpatient falls and neurological stroke patients has been successful using the LEAF tool by identifying gaps that existed in this patient population.

This project has provided early preventative measures for those at the highest risk of falling. Keeping patients safe and free from harm should be part of every facility's mission and vision. Because of the success of the implementation of LEAF tool, the staff have a sense of belonging, a purpose for sustainment, and positive social change as they

managed to decrease their falls. Positive social change occurs when using the LEAF tool, as it greatly contributes to enhancing communication among patients and staff who are measuring the criteria that contribute to inpatient falls and patient satisfaction.

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