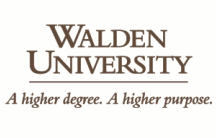

2019

Improving Early Mobilization in Acute Stroke Patients Through Best Practice Education

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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,
and that any and all revisions required by
the review committee have been made.

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Walden University
2019

Abstract

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Angela C. Middleton

MS, University of Missouri, 2011

BS, University of Missouri, 2004

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

May 2019

Abstract

Nonadherence to best practice guidelines in early mobilization in acute stroke increases the time from admission to mobilization and may increase residual long-term stroke effects. Early mobilization following an acute stroke is known to decrease long-term and secondary disability. The purpose of this project was to decrease the time from admission to mobilization in the acute stroke patient population by improving knowledge of best-practice guidelines in early mobility using an educational intervention for advanced practice nurse practitioners, physicians, and registered nurses. The practice-focused question for this project asked whether a staff educational program based on best-practice guidelines would decrease the time from admission to early mobilization in the acute stroke patient within the first 48 hours of admission. Rosswurm and Larrabee's 6-step model was used for this staff education project. A review of the literature indicated sources of evidence from peer-reviewed journals, which were used to support the staff education project and establish best practices in mobilization for the acute stroke patient. A before-and-after design was used to evaluate time from admission to mobilization within the first 48 hours in 40 acute ischemic stroke adult patients following educational intervention for 35 acute stroke staff. Data were collected and analyzed using descriptive statistics. Findings revealed a decrease in time from admission to mobilization by 18.59%. Findings may be used to promote best practices in other units within the hospital and may be used to decrease the residual long-term effects of a stroke, improve activities of daily living, decrease the length of hospital stay, and decrease the long-term cost and burden of stroke.

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Dedication

To my husband, thank you for always being my knight in shining armor. You have always adopted my dreams and made them your dreams. Together, we are unstoppable. I love you always.

To my children, thank you for your love and support. You inspired me to pursue my dreams while never making me feel guilty. I love you to the moon and back.

To my parents, thank you for all you sacrificed to make sure I would be the first generation in our family to go to college. I wish you were here to celebrate this accomplishment, but I know you are celebrating in heaven.

To my mentors and family, thank you for granting me your time and wisdom. I will forever be grateful.

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Section 1: Nature of the Project

Introduction

Early mobilization following an acute stroke is known to decrease the risk of long-term disability and secondary complications of stroke. Early mobilization is considered any out-of-bed activity within the first 72 hours of acute stroke hospital admission. Practice guidelines recommend early mobilization within the first 48 hours of admission for acute stroke patients. Stroke is a leading cause of disability in the United States (Centers for Disease Control and Prevention [CDC], 2017). Every 40 seconds someone in the United States will suffer a stroke (Benjamin et al., 2017). Worldwide 15 million people are diagnosed with a stroke each year (World Heart Federation [WHF], 2017). The cost of stroke care is $297.7 billion annually in the United States (Benjamin et al., 2017). Suffering from a stroke increases the risk for death within the first year of diagnosis with statistics revealing that 22% of men and 25% of women will die due to complications of a stroke, such as aspiration pneumonia, urinary tract infections, and falls (Lloyd-Jones et al., 2010). Early mobilization in acute stroke patients decreases the risk long-term disability by improving gait instability and independence of activities of daily living (Chippala & Sharma, 2016; Kumar, Selim, & Caplan, 2010; Maiko et al., 2017). Despite the information available, health care providers can experience a deterioration of knowledge on best care practices due to the lack of time to read and digest the latest evidence-based practice (EBP) advancements. Educational interventions based on EBP allow health care providers to advance their knowledge in a concise time frame. Providing targeted educational interventions has been shown to increase the adherence to

best practice guidelines (McCluskey & Bishop, 2009). Adherence to best practice guidelines in early mobilization improves patient outcomes, decreases the risk of secondary complications, decreases the length of hospital stays, and improves patient satisfaction (Clark, Stuchiner, Robison, Lucas, & Yanase, 2018).

Problem Statement

Mobilization for acute stroke patients at the local practicum setting was not meeting the current EBP recommendation for early mobilization time frame as outlined in the literature. The standard time from admission to mobilization in the acute stroke patient was within the first 72 hours with few patients being mobilized within the first 24 hours. Early mobilization within the first 24-48 hours has been shown to decrease the long-term residual effects of stroke (Maiko et al., 2017). Following an acute stroke, approximately 22% of stroke patients have gait instability, and 24-53% are dependent on others for activities of daily living (ADL) due in large part to mobility issues (Kalra & Langhorne, 2007). Early mobility improves gait instability and increases independence in ADL (Chippala & Sharma, 2016; Maiko et al., 2017). Immobility also contributes to comorbidities in stroke including pneumonia, deep venous thrombosis, skin breakdown, and muscle atrophy (Poletto et al., 2015). Interventions that reduce immobility after acute stroke and serve to decrease complications include early mobilization (Poletto et al., 2015). Patients who received early mobilization within the first 24-72 hours of admission showed improvement in ADL scores compared to those who received standard mobilization (Maiko et al., 2017). Those who received early mobilization with an increased frequency and intensiveness of therapy also exhibited better ADL scores. A

similar retrospective analysis showed significant improvements in ADL scores in patients who received early, frequent, and more intense mobilization (Yagi et al., 2017). Additional evidence indicated that early mobilization increased self-care ability and ADL (Chippala & Sharma, 2016). Through implementation of early mobilization, residual effects of acute stroke may be minimized and ADL scores may be improved, thereby improving mobility and decreasing long-term disability caused by immobility in stroke survivors. Although early mobilization in acute stroke patients can improve mobility, documents indicated that early mobilization was not consistently being initiated within the first 24-48 hours of admission at the local clinical practice site. Neurology advanced practice nurses and stroke team leadership at the practice site reported that a problem existed related to knowledge of best practice guidelines regarding early mobilization in acute stroke patients. This project addressed this gap in knowledge of best practice guidelines by promoting staff education on best practices in early mobilization in acute stroke patients. This project promoted the Institute of Medicine's (2010) recommendation to improve the interdisciplinary relationships between nurses, nurse leaders, advanced practice nurse practitioners (APRNs), and physicians while improving the practice environment.

Purpose Statement

The gap in nursing practice that was the focus of this evidenced-based project was the lack of adherence to best practice guidelines for early mobilization in the acute stroke patient in the acute stroke unit. The purpose of this project was to decrease the time from admission to mobilization within the first 48 hours of admission in acute stroke patients.

The practice-focused question for this project asked whether a staff educational program based on best practice guidelines would decrease the time from admission to early mobilization in the acute stroke patient within the first 48 hours of admission. A staff education design program was used to address early mobilization in the acute stroke patient. This project aligned with the types of scholarly projects conducted by Doctor of Nursing Practice (DNP) students through the development and planning for staff education and quality improvement in the practice setting. An educational program of best practice guidelines was employed to increase early mobilization rates by educating APRNs, physicians, and RNs on the evidence-based practices on early mobilization in the acute stroke unit. According to Walden University (2015), the DNP project should be based on evidence-based practice and address the needs of the practice setting.

Nature of the Doctoral Project

A before-and-after design was used for this staff education DNP project to determine whether there was a decrease in time from admission to mobilization within the first 48 hours of admission in acute stroke patients after the implementation of a staff educational program based on early mobilization best practices for APRNs, physicians, and RNs in the acute stroke unit. Data gathered to answer the project question included the time from admission to mobilization in 20 acute stroke patients. These data were gathered before and after the educational intervention. De-identified demographic data obtained for the project included the type of stroke, age, gender, the use of tissue plasminogen activator (tPA), time of admission, time of mobilization order placement, and time of mobilization. The clinical practice site agreed to provide the data to answer

the project question through the use of the electronic medical record allowing for a secondary data analysis to be performed to provide the outcome for the project.

The evaluation model that was used for this staff education DNP project was Rosswurm and Larrabee's model for EBP change. Rosswurm and Larrabee's model is a 6-step evaluation process that uses a change theory framework that works well with educational interventions and quality improvement processes (White, Dudley-Brown, & Terhaar, 2016). This model has been tested in acute care settings similar to the acute stroke unit at the clinical site and offered the best framework for this project (White et al., 2016). This model is easily integrated into the acute care setting and offers health care providers a practical framework as a guide (White et al., 2016).

Rosswurm and Larrabee's model was chosen due to the 6-step model and the ease of implementing changes based on EBP in the clinical practice setting (see White et al., 2016). The 6-step model was used to (a) assess the need for the change in policy and education in early mobilization in acute stroke patients by comparing the internal and external data, (b) link the problem with the educational intervention and outcomes, (c) compile the best evidence in acute stroke mobilization and education based on EBP, (d) develop a strategy for a change in practice, (e) implement and evaluate the education intervention and the change in patient outcomes, and (f) integrate and maintain the practice change (Rosswurm & Larrabee, 1999). This practice model allowed for continuous evaluation and change to current practice guidelines based on the decrease in time from admission to mobilization.

Significance

This project may have a profound impact on the key stakeholders at this organization, including neurology physicians, APRNs, nursing staff, physical therapists, and administrators, by decreasing the risk of complications that would prolong the length of hospital stay in acute stroke patients. Death is a common complication of stroke estimated to be as high as 19% within the first 30 days of acute stroke (Thrift et al., 2009). Many of the patients who had been diagnosed with stroke at the project site also had multiple comorbidities that increased the risk for complications, including diabetes, atrial fibrillation, vascular disease, hypertension, hyperlipidemia, and cardiovascular disease. Other complications may arise from the injury to the brain caused by the stroke with immobility being one of the most significant (Thrift et al., 2009). Immobility can lead to additional complications that increase the risk of death within the first 30 days following a stroke (Thrift et al., 2009). Deep venous thrombosis (DVT) increases the risk of death following a stroke (Thrift et al., 2009). Immobility increases the risk of DVT (Thrift et al., 2009). Approximately 40% of acute stroke patients develop a DVT and 12% have pulmonary emboli within the first week following a stroke (Kumar et al., 2010). Complications of stroke account for approximately 51% of stroke deaths within the first 30 days (Bernhardt, Dewey, Thrift, & Donnan, 2005). Many of the complications caused by a stroke increase the longer the patient is left immobile (Thrift et al., 2009). Immobility can be impacted by interventions provided by acute stroke unit staff and have the potential to limit long-term disability associated with acute ischemic stroke (Thrift et al., 2009). Findings from this staff education DNP project in early mobilization may be

transferable to the entire organization including the intensive care unit (ICU), medical-surgical unit, and oncology unit. This project opens the door for future studies and may decrease the risk of readmission by a recurrent stroke.

The DNP staff education project for the acute stroke unit was based on the premise that nursing practice is based on holistic care that promotes an interdisciplinary approach to patient wellness. This project promoted a client-based approach that reduces the risk of complications due to immobility. Models of care that provide an integrated approach for chronically ill patients have been shown to be more effective in reducing the risk of secondary complications during hospitalization (Cumbie, Conley, & Burman, 2004). An estimated 795,000 people are diagnosed with a stroke each year, and the estimated lifetime cost is $140,000 per person (Ma, Chan, & Carruthers, 2014). Because the population continues to age and the stroke risk doubles with each decade over the age of 55 years, the cost of stroke-related health care is expected to increase dramatically (Ovbiagele et al., 2013). Stroke costs account for 1.7% of all U.S. health care expenditures, averaging $75 billion in hospital treatment (Ovbiagele et al., 2013). This project may have a positive impact on social change as early mobilization has been shown to decrease the residual long-term effects of stroke and improve ADL. Decreasing long-term disability may have an impact on the future cost of stroke care and the social burden of caring for stroke patients who are no longer able to care for themselves.

Summary

The local project site had an identified gap in nursing knowledge in the area of early mobilization in acute stroke patients. The purpose of this project was to determine

whether early mobilization decreased the time from admission to mobilization within the first 48 hours of admission in acute stroke patients. The practice-focused question for this project asked whether staff education on adherence to best practices in early mobilization by APRNs, physicians, and RNs decreased the time from admission to mobilization within the first 48 hours of admission. A staff education design program was used to address early mobilization in the acute stroke patient. The implications for social change are significant given the estimated health care expenditures related to stroke and the impact this project may have on reducing long-term residual effects. Section 2 includes a discussion of the supporting model, background information for this project, and the role of the DNP team in this program.

Section 2: Background and Context

Introduction

The practice problem focus for this staff education DNP project was early mobilization in acute stroke patients. The purpose of this project was to guide APRNs, RNs, and acute stroke unit staff in the practice of early mobilization in acute stroke patients while reducing the time from admission to mobilization within the first 48 hours of admission in acute stroke patients. The practice-focused question for this project was whether education on best practices in early mobilization in adult acute stroke patients on a stroke unit would decrease the time from admission to mobilization within the first 48 hours of admission. Rosswurm and Larrabee's Model was used to guide the project. The project findings may be used to advance nursing practice by promoting early mobilization in acute stroke patients at the local site.

Concepts, Models, and Theories

Rosswurm and Larrabee's model was chosen to assist in an organizational policy-driven practice to an EBP guideline in early mobilization in acute stroke patients (see White et al., 2016). Developed at the University of West Virginia in 1999, this model was tested in the acute care setting similar to the DNP project clinical site (see White et al., 2016). This 6-step model was chosen for the ease in assessment regarding the need for an organization-wide policy change and education in early mobilization in acute stroke patients, and to decrease the time from admission to mobilization in acute stroke patients. This model was chosen to guide APRNs through the change process and support EBP changes from quantitative and qualitative data (see Rosswurm & Larrabee, 1999). The

model was used to identify the need for change by comparing hospital policy and quality indicators against external data that could be linked to a specific intervention (Rosswurm & Larrabee, 1999). This change theory allowed for research outcomes to be linked to clinical judgment, which was vital in the acute care setting.

Relevance to Nursing Practice

The care that a hospital should provide following a stroke was researched in a landmark study conducted by the Brain Attack Coalition (Alberts et al., 2013). Although hospitals may serve patients in many geographical and clinical locations, the Brain Attack Coalition determined the need for stroke centers and established guidelines for the creation of these centers as well as recommendations on the services that should be available to patients at these centers (Alberts et al., 2013). There are currently two levels of stroke centers based on the level of care and services that are available: primary stroke centers and comprehensive stroke centers. For a facility to be certified as a primary stroke center or acute stroke-ready hospital, criteria must be met. The center must have an acute stroke team; established stroke protocols; emergency medical services (EMS) trained in the area of stroke; laboratory testing, electrocardiogram, and chest radiography available 24 hours a day; brain imaging available 24 hours a day; a designated stroke unit; IV tPA available 24 hours a day; neurosurgical services available onsite or by transfer; and telemedicine/teleradiology (Alberts et al., 2013). Acute stroke-ready hospitals also possess certain key elements: acute stroke teams; stroke protocols, EMS trained in stroke; rapid laboratory and radiological testing; telemedicine, ability for hospital transfers, and IV tPA and reversal agents (Albert et al., 2013). Acute stroke patients were found to have

improved outcomes in both primary stroke centers and acute stroke-ready hospitals (Albert et al., 2013).

With EBP showing improved outcomes in the acute management of stroke patients in certified stroke centers, it is imperative to establish guidelines or protocols based on EBP for the care of acute stroke patients from admission until they are discharged. EBP is critical in caring for stroke patients as it allows the patient to receive the most effective treatment available. Get With the Guidelines Stroke, an in-hospital collaboration program developed by the American Heart Association, promotes the use of the most recent EBP to improve the care of stroke patients (Schwamm et al., 2009). This program allows participating hospitals to access the most up-to-date research and provides educational opportunities, clinical and patient resources, and submission of Centers for Medicare & Medicaid Services Core Measures for stroke and performance feedback (Schwamm et al., 2009). Research has shown that patient outcomes have improved with adherence to the Get With the Guidelines Stroke (Schwamm et al., 2009). This program not only provides information to participating hospitals, but it also allows hospitals to input their patient outcomes data. This process allows for an increase in knowledge and adaptation of treatment guidelines based on those outcomes. Reportable stroke metrics related to this staff education DNP project were the use of physical therapy, occupational therapy, and acute rehabilitation consults of the acute stroke patient while admitted to the inpatient hospital setting. Get With the Guidelines Stroke is based on the best and most up-to-date EBP on therapy and acute rehabilitation services to decrease long-term disability in acute stroke patients.

Interdisciplinary teams are an integral factor in the care of an acute stroke patient when deliberating EBP that will optimize patient outcomes based on physical therapy to decrease the rate of long-term disability. Tyson, Burton, and McGovern (2015) conducted a study in an inpatient rehabilitation unit to determine whether interdisciplinary team meetings would have an impact on the patient's length of stay and improve the patient's functional abilities in the completion of ADL. Although the study revealed no significant changes in the acute stroke patient's length of stay in the rehabilitation unit, there was a significant increase in the Barthel Index scores that measure the change of independence based on functional abilities (Tyson et al., 2015). This study indicated that the use of interdisciplinary teams to improve physical therapy times based on the individual stroke patient is feasible and may lead to increased independence in ADL (Tyson et al., 2015).

There was fear at one time that early mobilization in acute stroke patients was not safe (Bernhardt et al., 2015). It was feared that the decreased blood flow to the brain during ambulation could lead to further damage to the penumbra (Bernhardt et al., 2015). Efficacy and safety have continued to be areas of study in early mobilization in acute stroke patients. A systematic review and meta-analysis were completed with nine randomized control trials with 2,803 participants indicated that there was no increased risk of death or complications from early mobilization in the acute stroke patient (Xu et al., 2017).

Although it is well known that early mobilization in acute stroke patients decreases the long-term residual effects of stroke and improves patient outcomes, the ideal moment to begin physical therapy is still being debated. The risk of adverse events

developing during hospitalization is decreased when early mobilization is implemented (van Wijk, Cumming, Churilov, Donnan, & Bernhardt, 2012). The current standard for mobilization is between 24 and 72 hours from admission or once the patient can safely tolerate the activity. Even with standard mobilization starting between 24 and 72 hours from admission, research has shown improved patient outcomes (van Wijk et al., 2012). Early mobility through physical therapy has been found to improve overall motor function and reduce the risk of developing long-term complications (Sundseth, Thommessen, & Rønning, 2014). More recent evidence has shown that even earlier mobilization, within the first 24 hours, showed improvement in ADL at the 3-month follow-up appointment (Chippala & Sharma, 2016).

Current evidence in early mobilization in acute stroke patients is trending toward even earlier and more intense physical therapy. In research published by Maiko et al. (2017), the ADL of 100,719 patients who received rehabilitation were evaluated for improvement in ADL scores. The experimental group received early and intensive therapy, and the control group received standard mobilization within the first 72 hours of admission at 45 minutes per day (Makio et al., 2017). Patients who received an increased frequency and intensiveness of therapy within 24 hours showed better ADL scores (Makio et al., 2017).

A small study completed in 2016 showed similar results. Chippala and Sharma (2016) evaluated the ADL of 43 participants who received therapy within 24 hours of admission with an increased frequency of at least twice a day lasting from 5 to 30 minutes. The results indicated that residual effects of a stroke were reversible with fewer

remaining disabilities and increased ADL scores in patients who received the intensive treatment compared to those who received standard treatment (Chippala & Sharma, 2016).

A retrospective pre and post comparison in a Japanese hospital was completed over a 4-year period to determine whether early and intensive rehabilitation had a functional impact on acute ischemic stroke patients (Imura et al., 2018). Imura et al. (2018) evaluated 1,588 participants who were admitted to the stroke unit. During the first 2 years of the study, the acute stroke patients received standard mobilization during their hospital admission (Imura et al., 2018). The second phase of the study began after the early and intensive rehabilitation program had been implemented by the hospital (Imura et al., 2018). The second group received physical therapy within 24 hours of admission, which was more intensive and frequent compared to the standard mobilization group (Imura et al., 2018). The results showed that the ADL were significantly higher in the patients who received early and more intensive rehabilitation than those who received standard mobilization during their hospitalization (Imura et al., 2018).

A similar study completed by Bernhardt et al. in 2016 showed similar results. The 2,104 participants in the A Very Early Rehabilitation Trial were randomly assigned to receive frequent and early mobilization within 24 hours of admission with the aim to provide guidance to health care providers regarding the time, amount, and frequency of mobilization following the onset of acute stroke (Bernhardt et al., 2016). Bernhardt et al. followed the patients for 3 months and found that shorter, frequent, and earlier mobilization showed better outcomes when controlled for the patient's age and stroke

severity. This study also revealed safety and efficacy in early and frequent mobilization (Bernhardt et al., 2016).

The current staff education DNP project addressed the gap in nursing knowledge regarding education related to the safety and efficacy of early mobilization in the acute stroke patient. The most recent EBP research and outcomes were presented to the staff of the acute stroke unit. This educational strategy was used in Canada when addressing increased weakness in ICU patients (Koo et al., 2017). Koo et al. (2017) found that the physicians and therapists underestimated the benefit of early mobilization to decrease the deficits after a prolonged illness. The local DNP project site had an identified gap in nursing knowledge in the area of early mobilization that was similar to the site addressed by Koo et al.

Local Background and Context

Although the most recent EBP research showed improved patient outcomes in early mobilization within 24-48 hours in acute stroke patients, the local facility's policies had no dictated time frame for mobilization to occur during the admission (Lead Neurologist, personal communication, February 22, 2017). Prior to the implementation of the DNP project, local data showed that over 75% of physical therapy and occupational therapy orders were placed more than 12 hours after admission (Time Critical Diagnosis Coordinator [TCDC] Assistant, personal communication, February 22, 2017). The time from admission to mobilization was estimated to be 36-48 hours in 25% of the acute stroke patients and 48-72 hours in 50% of the patients; only 3% of acute stroke patients received mobilization in the first 24 hours (TCDC Assistant, personal communication,

February 22, 2017). In the remaining acute stroke patients, no order for therapy was placed (TCDC Assistant, personal communication, February 22, 2017).

The patient outcomes at the local facility in the areas of ADL and mobility did not correspond with the outcomes on a national level. Over 90% of acute stroke patients who were discharged from the inpatient setting to the acute rehabilitation unit had residual deficits upon discharge home (Lead Neurologist, personal communication, February 22, 2017). Length of hospitalization was higher compared to state and national averages (TCDC Assistant, personal communication, February 22, 2017). This was believed to be due to patient comorbidities and the lack of specialties available at the local facility rural hospital. These beliefs were compared to external data on the size of the hospital, specialties offered, and comorbidities statewide and were found to be comparable.

The project facility has a stroke committee that oversees all policies and patient outcomes in the acute stroke unit. The stroke committee members were involved in the initial assessment to identify the project focus question. Initial data from the local facility showed that less than 25% of mobility began in the first 24 hours and less than 50% began within the first 48 hours (TCDC Assistant, personal communication, February 22, 2017). These data were compared to the state and national data in which over 75% of mobility began within the first 48 hours. Findings suggested that the lack of adherence to early mobilization might play a role in the decrease in patient outcomes at the local organization.

Definitions and Terms

For this DNP staff education project, the definitions of terms were as follows:

Acute stroke: A neurological deficit attributed to a sudden focal injury that causes the death of brain cells due to lack of oxygen from a diminished blood supply to a focal area of the brain (Sacco et al., 2013). The vascular cause of injury can be ischemic, embolic, hemorrhagic, or cryptogenic. Approximately 85% of strokes in adults are ischemic, and 15% are hemorrhagic (Sacco et al., 2013).

Deep vein thrombosis: The formation of a blood clot or thrombus in one of the deep veins of the body, usually occurring in an extremity (Kesieme, Kesieme, Jebbin, Irekpita, & Dongo, 2011).

Early mobilization: Mobilization occurring within the first 24 hours of acute stroke admission (Bernhardt et al., 2015).

Hemorrhagic stroke: A stroke that occurs from the rupturing of an artery within the skull (Sacco et al., 2013). This may occur from an atherosclerotic vessel that has hardened over time due to uncontrolled hypertension or advanced age. For the purpose of this study, only acute ischemic strokes were included.

Ischemic stroke: A stroke that occurs when there is a diminished blood supply to a focal area of the brain caused by thromboembolism or the plugging of an artery by a traveling blood-clot fragment (Sacco et al., 2013).

Mobilization: Any activity that requires getting out-of-bed, including transferring to a chair or bedside commode, completing ADL, ambulating in the room or hallway, or other activities that are not completed while in bed (Bernhardt et al., 2015).

Secondary complication: An unfavorable complication that develops as a result of a primary disease process, previous condition, or the care provided (Atkins et al., 2012).

Standard mobilization: The normal time-frame from admission to mobilization in the acute stroke unit. Standard mobilization is currently within 72 hours of admission from the onset of acute stroke symptoms (Bernhardt et al., 2015).

Role of the DNP Student

The practice setting for this DNP project was a small rural hospital in the Upper Midwest region of the United States. This 242-bed facility has a designated stroke unit (Human Resources Assistant, personal communication, January 4, 2016). Because this is one of the few hospitals in the area, many acute stroke patients are admitted to this unit and are managed by the stroke team advanced practice nurses. I currently work with the stroke team in the acute care setting but have no managerial or supervisory role over the nurses or staff in this unit. Before this practicum, I was not a member of the stroke committee and had no influence over the policies or guidelines for the acute stroke unit. I was the leader and coordinator of this doctoral project. I completed the literature review and developed an educational intervention based on the latest EBP. This doctoral project was selected based on the current stroke certification status at the practicum site. The facility is stroke certified and was awarded a bronze level certification. My motivation was improving the stroke certification to gold level and improving patients' long-term outcomes.

Role of the Project Team

A project team was created to provide feedback and expert advice for this staff education DNP project. The team members were APRNs, charge nurses, lead physical therapists, and nurse managers on the acute stroke unit, members of the stroke committee,

the information technology (IT) department, the TCDC, and the lead neurologist for the stroke team. The members of this team participated in critiquing the literature review to determine the best practices in early mobilization in the acute stroke patient population. Team meetings were held on a monthly basis in conjunction with the stroke committee meetings. During these meetings, feedback was provided on the literature reviews, educational intervention material, best practice guidelines, implementation and evaluation plans, and current stroke guidelines. The staff education DNP project team provided feedback throughout the DNP project on a monthly basis.

A projected timeline was established by the project team for implementation, evaluation, and dissemination of the DNP project. Once IRB authorization was obtained, the DNP staff education project was implemented as follows:

- Day 0: Educational intervention was provided to the stroke unit staff
- Day 1-30: Data collection commenced. The IT specialist and TCDC provided ongoing de-identified stroke patient information for the staff education DNP project following the educational intervention for thirty days.
- Day 31-40: The de-identified data of time from admission to mobilization pre and post educational intervention were analyzed to determine the outcome of the DNP staff education project.
- Day 41-44: The DNP outcomes were synthesized and published for dissemination to key stakeholders.
- Day 45: Dissemination of the findings was provided to the stroke committee and administration.

Summary

Evidence supports that early mobilization within 24 hours of admission in acute stroke patients decreases the risk of secondary complications and improves patient outcomes. Although the clinical facility received national stroke certification, initial data indicated that the stroke unit continued to practice the minimum acceptable mobilization recommendations. This facility lagged behind in patient outcomes in comparison to state and national averages. It was felt that APRNs could play a key role in promoting EBP and decreasing the time from admission to mobilization in the acute stroke unit. Rosswurm and Larrabee's Model was selected to guide the assessment, collection, and analysis of the data in the gap-in-practice and the relationship to patient outcomes. Section 3 will discuss the project question, evidence supporting the project, and conclude with a presentation of the planned analysis and synthesis of the collected data.

Section 3: Collection and Analysis of Evidence

Introduction

Nonadherence to best practice guidelines in early mobilization in acute stroke patients has been linked to long-term residual effects of stroke and increased secondary complications during hospitalization. The purpose of this DNP staff education project was to guide APRNs, nurses, and acute stroke unit staff in the use of best practice guidelines in early mobility to decrease the time from admission to mobilization within the first 48 hours of admission in acute stroke patients. Get With the Guidelines Stroke promotes the use of best practice guidelines based on the most recent EBP to improve the outcomes of acute stroke patients (Schwamm et al., 2009). This program provides information to participating hospitals and allows hospitals to input their stroke metrics. Reportable stroke metrics related to this staff education DNP project were the use of physical therapy, occupational therapy, and acute rehabilitation consults during the acute stroke patients' inpatient hospitalization. This section includes the purpose of the study and how it aligned with the practice-focused question. Clarification on how the evidence was collected and analyzed is provided. An extensive literature review was completed, and the interpretation of the data is explained.

Practice-Focused Question

Early mobilization in acute stroke patients at the local organization was not meeting the best practice guideline recommendations supported by the most recent EBP. The standard mobilization time was within the first 72 hours with only a small percentage being mobilized within the first 24 hours of admission. Although early mobilization

within the first 24-48 hours of admission has been shown to reduce residual effects and long-term disability caused by stroke, the local organization was not consistently reaching this benchmark (Lead Neurologist, personal communication, February 22, 2017). The gap in nursing practice that was the focus of this staff education DNP project was the lack of adherence to the best practice guidelines in early mobilization in the acute stroke patient.

The purpose of this project was to use education to decrease the time from admission to mobilization within the first 48 hours of admission in acute stroke patients. The use of an educational intervention to encourage the use of best practice guidelines in early mobilization by the staff in the acute stroke unit aligned with the practice-focused question as to whether the implementation of a staff educational program based on best practice guidelines would decrease the time from admission to early mobilization in the acute stroke patient within the first 48 hours of admission by increasing mobilization.

A before-and-after design was used for this staff education DNP project to determine whether there was a decrease in time from admission to mobilization within the first 48 hours of admission in acute stroke patients after the educational intervention for staff in the acute stroke unit. Data that were gathered to answer the project question included the time from admission to mobilization in 20 acute stroke patients. These data were gathered before and after the educational intervention. De-identified demographic data were also obtained for the project and included the type of stroke, age, the use of tPA, time of admission, time of mobilization order placement, and time of mobilization. The clinical practice site agreed to provide the data to answer the project question

through the use of the electronic health record (EHR) allowing for a secondary data analysis to be performed to provide the outcome for the project.

Sources of Evidence

The need to reduce the residual effects of stroke through the implementation of early mobilization had never been greater in the local organization than it was at the time of the project. The local organization is stroke certified, and the admission rate of stroke patients had dramatically increased during the previous year (Lead Neurologist, personal communication, February 22, 2017). The interdisciplinary team was motivated for the implementation of the staff education DNP project to determine whether the educational intervention would decrease the time from admission to mobilization through the use of best practice guidelines.

Evidence was collected through the use of the EHR. The information technology technician (ITT) assigned to the neurology department was identified as the point of contact to provide the de-identified demographic data on the acute stroke patients. This information was provided in the form of an Excel file from the TCDC coordinator after it had been created by the ITT based on information collected from the EHR. Sources of evidence included the type of stroke (ischemic, cryptogenic, or hemorrhagic), patient's age, the use of tPA, time of admission, time of mobilization order placement, and time of mobilization.

The evidence was collected during 30-day periods before and after the educational intervention. The admission to mobilization times were compared to determine whether the educational intervention affected the use of best practice

guidelines in early mobilization in acute stroke patients by demonstrating a decrease in time from admission to mobilization in the postintervention data set.

Published Outcomes and Research

An exhaustive literature review was completed using the PubMed/Medline, CINHAL, RefWorks, Web of Science, Up to Date, Sage full-text, and Medline Plus databases. I also used the Google Scholar search engine. The Boolean string search terms included *early mobilization* AND *acute stroke*, *early mobilization* AND *ischemic stroke*, *cerebral vascular accident* AND *early mobilization*, *stroke* AND *early mobilization*, *stroke rehabilitation* AND *early mobilization*, *improved stroke outcomes* AND *early mobilization*, and *physical therapy* AND *early mobilization*. Inclusion criteria included articles published between 2012 and 2018. Approximately 211 articles were reviewed and 64 were included in the literature review. This literature review included the pathophysiology of an acute stroke and understanding of early mobilization, the safety and efficacy of early mobilization in ischemic and hemorrhagic stroke patients, the benefits of early mobilization through the reduction of secondary complications and residual long-term effects, and improvement in ADL and cognitive abilities. The current research supported the use of early mobilization in acute stroke patients. The literature review also addressed the most recent best practice guidelines to reduce the risk of long-term disability through the use of early mobilization.

An acute stroke is a neurological event that causes injury or death of brain cells due to a lack of oxygen from an interruption of the blood supply to the brain (Sacco et al., 2013). An ischemic stroke is caused by a thromboembolism or a blockage in an artery

and accounts for roughly 85% of strokes (Sacco et al., 2013). Hemorrhagic strokes account for the remaining 15% and are due to a ruptured vessel within the brain (Sacco et al., 2013). Stroke can occur at any age and does not discriminate based on gender (CDC, 2017). Every 40 seconds someone in the United States will suffer a stroke (Benjamin et al., 2017). Stroke is one of the leading causes of disability in the United States (Benjamin et al., 2017). Stroke is the fifth leading cause of death in people 15-59 years of age and is considered the primary cause of death in individuals over the age of 60 (CDC, 2017). Vascular risk factors including hyperlipidemia, high blood pressure, atrial fibrillation, diabetes, clotting disorders, obesity, and tobacco use place individuals at an increased risk for stroke (CDC, 2017). Having a first-time stroke puts an individual at an increased risk for recurrent stroke (CDC, 2017). Statistics reveal that suffering from a stroke also increases the risk of death due to secondary complications or recurrent stroke within the first year of diagnosis (Lloyd-Jones et al., 2010). Studies revealed that most stroke survivors suffer from some type of long-term residual effect with 18% of acute stroke patients suffering from dysphagia, 22% having difficulty with ambulation, and 53% being dependent on caregivers for ADL (Kalra & Langhorne, 2007). Although stroke care has improved, more than 50% of stroke patients have persistent residual disabilities with 33% requiring care at long-term care facilities (Livingston-Thomas et al., 2016). The main goal of stroke treatment is to reduce the long-term residual effects of stroke that would increase the risk of death and secondary complications. Early mobilization in acute stroke patients has been identified as a treatment option that decreases long-term

disability, reduces secondary complications, and improves independence in ADL (Kumar et al., 2010).

Early mobilization is defined as a physical or occupational therapy intervention aimed at reducing the time from stroke onset and patient admission to the first mobilization (Hodgson, Berney, Harrold, Saxena, & Bellomo, 2013). Although there is no firm guidance on early mobilization in acute stroke patients, mobilization of the patient within the first 48 hours is considered safe in most patients with the potential benefit to reduce residual long-term disability and secondary complications. For many years, early mobilization was thought to decrease cerebral blood flow, which would cause increased damage to the areas of the stroke, the core ischemic zone, and the ischemic penumbra. This theory was proven irrelevant when several research studies were completed that showed cerebral blood flow was not reduced in acute stroke patients (Diserens et al., 2012; Poletto et al., 2015). Research has shown the opposite with a reduction in neurological deficits at the 3-month period in ischemic stroke patients who received early mobilization rather than standard care (Diserens et al., 2012). Study outcomes also showed a reduction in severe complications in the early mobilization group in comparison to the standard care group with no reduction in cerebral blood flow in the early mobilization group (Diserens et al., 2012). Although providers and staff are concerned about the safety and feasibility of early mobilization in the acute stroke population, studies have shown no increase in residual or secondary complications in ischemic stroke patients who receive mobilization within the first 24 hours of admission (Poletto et al., 2015). Most of the research addressed in the literature review was

conducted using ischemic stroke patients because this group of stroke patients is considered more stable than hemorrhagic stroke patients. Early mobilization is not felt to be as risky to coordinate and regulate in the ischemic stroke population compared to the hemorrhagic stroke population.

Many providers feel that hemorrhagic stroke patients are not stable enough for early mobilization due to the significance of cerebral injury and the increased risk of injury due to decreased cerebral blood flow, but this is simply not the case (Bernhardt et al., 2015). Recent studies revealed no difference in neurological deterioration between patients who received standard therapy and those who received early mobilization (Bernhardt et al., 2015). Further research demonstrated that early mobilization did not cause neurological deterioration or increase secondary complications such as hypotension, falls, or syncope (Bahouth et al., 2018). In addition, large systematic reviews and meta-analyses supported the use of early mobilization with outcomes that revealed no increased risk of complications or death from early mobilization in the acute stroke patient population (Xu et al., 2018). Early mobilization in ischemic and hemorrhagic stroke patients is considered safe even if the intensity and frequency of therapy must be reduced (Xu et al., 2018).

Earlier and more frequent mobilization has also been theorized to impact residual outcomes of stroke. Studies have shown that increased frequency of mobilization reduces the residual long-term effects of stroke (van Wijk et al., 2012). Increase in frequency of early mobilization did not result in an increase in adverse events as many authors hypothesized in earlier studies (van Wijk et al., 2012). Further research has shown that

frequent, early, and more intensive mobilization accelerates patients' functional ability of independent ambulation and improves functional recovery (Cumming et al., 2011). Early mobility in the acute stroke patient has demonstrated improved gait instability and independence in completing ADL (Chippala & Sharma, 2016; Maiko et al., 2017). Immobility is one of the leading residual effects of a stroke that leads to long-term disability and loss of independence (CDC, 2017). Early mobilization within the first 24-48 hours in acute stroke patients in the inpatient setting has been shown to increase functional outcomes (Karic, Roe, Nordenmark, Becker, & Sorteberg, 2016). More frequent out-of-bed sessions of therapy have shown improvement in patient outcomes (Bernhardt et al., 2016). Research based on patient outcomes revealed that initial mobilization in the acute stroke patient should be more frequent and less intense within the first 24 hours to produce the best odds of positive outcomes at the 3-months post-stroke period (Bernhardt et al., 2016). The goal of therapy is to promote independence and recovery in the acute stroke patient population. Loss of independence after a stroke can be debilitating to patients and their families. Several studies supported early mobilization with outcomes revealing increased independence at 3 months (van Wijk et al., 2012). Early mobilization patients have been shown to be 3 times more independent with ADL at 3 months post-stroke than standard care patients (Craig, Bernhardt, Langhorne, & Wu, 2010; van Wijk et al., 2012). Independence of the acute stroke patient decreases caregiver time and the risk of caregiver burnout (Oliva-Moreno et al., 2018).

It is vital for providers and staff to gain greater awareness of the importance of early mobilization in the recovery of the acute stroke patient. Patients who are mobilized

within 24 to 72 hours from stroke admission showed improved scores on their Glasgow Coma Scale, National Institutes of Health Stroke Scale, and Functional Independence Measure from admission to discharge with the most significant improvement being seen in the patients who are mobilized within the first 24 hours of stroke onset and admission (Yoshikawa et al., 2018). Early mobilization is felt to be safe and beneficial to acute stroke patients in multiple areas (Yoshikawa et al., 2018). Recent studies have indicated that early mobilization may have a positive impact on cognitive abilities in the acute stroke population (Cumming et al., 2018).

Very early mobilization was believed to have a negative impact on patients' long-term cognitive abilities, but recent research has shown that is not the case. Researchers now believe that there may be a time-critical period that overlaps with neuroplasticity after the initial injury caused to the brain by an acute stroke (Livingston-Thomas et al., 2016). Early mobilization and rehabilitation in acute stroke patients decreases depression, improves cognitive skills, and impacts overall recovery (Livingston-Thomas et al., 2016).

Long-term residual effects of stroke and immobility contribute to secondary complications of a stroke. Early mobilization has been shown to decrease the risk of secondary complications. Studies have shown that at least 51% of patients in standard care groups experience at least one complication in comparison to only 35% in early mobilization groups (f et al., 2010). Immobility accounts for 68% of the secondary complications in standard care groups and 36.8% in early mobilization groups (Craig et al., 2010). Early mobilization has been shown to decrease secondary complications such as deep vein thrombosis, pulmonary emboli, and pressure ulcers (Jauch et al., 2013).

Earlier stroke guidelines promoted initial bed rest for acute stroke patients for fear that early mobilization may increase the risk of severe complications such as death (Jauch et al., 2013). Researchers who evaluated patients based on the Rankin scale, Barthel Index, death rate, and length of hospital stay found no increase in severe complications, such as death, in the early mobilization group (Li, Zhang, Wang, & Wen, 2018). Participants who received early mobilization showed an increased Barthel index and decreased length of hospital stay (Li et al., 2018).

Research in the area of early mobilization is relatively new with best practice guidelines continuing to change. With EBP guidelines being implemented nationwide in the area of early mobilization, secondary complications are decreasing on specialized stroke units by as much as 30% over the last ten years (Bovim, Askim, Lydersen, Fjærtoft, & Indredavik, 2016). Although the management of stroke has improved over the last several years, stroke is still a leading cause of death and significant cause of long-term disability worldwide (WHF, 2017). Implementation of best practice guidelines in the management of acute stroke patients may reduce the long-term residual side effects that contribute to disability. Furthermore, best practice guidelines in the management of acute ischemic stroke by providing early mobilization contributes to improved patient outcomes and may reduce the risk of secondary complications of acute stroke.

Evidence Generated for the Doctoral Project

The target population for this staff education DNP project included adult patients age 18 years or older who were admitted to the acute stroke unit due to acute ischemic stroke. The targeted number was 20 participants in each group. For patients to meet the

inclusion criteria, they had to be adults that were 18 years or older, diagnosed with ischemic or cryptogenic stroke, admitted to the acute stroke unit at the project site, or may be diagnosed with other chronic illnesses. Patients were excluded from the study if they were diagnosed with a hemorrhagic stroke, younger than 18 years of age, not admitted to the acute stroke unit at the project site, received tPA during the admission, or were diagnosed with acute conditions that would impact safety in early mobilization.

Protections

Approval from the Walden Institutional Review Board (IRB) #11-28-18-0676643 was obtained before conducting the DNP project. No risk or discomfort to the patient was involved in the collection of the data. The facility had formal safeguards in place to ensure all patient identifiers were removed by the ITT before dissemination of the data for analysis. This safeguard involved a two-step process. The data were de-identified by ITT. This data were then transferred to the TCDC to ensure that no patient identifiers were contained in the datasets. The data were contained in an Excel file on a desktop computer that was double passcode protected in the TCDC's office which required key and badge entry. Access to the office was only accessible when the TCDC was onsite. Data were kept for thirty days after the completion of the Staff Education DNP project. Data were then deleted by the student in the presence of the TCDC.

Analysis and Synthesis

Best practice guidelines for early mobilization in acute stroke patients is taught on an annual basis at this organization and was reemphasized during this staff education DNP project. Because this was part of the approved annual training, consents and options

for non-participation were not required. Five physicians who were considered experts in the area of acute stroke and early mobilization reviewed the educational material for approval prior to the intervention.

A before-and-after design was used to evaluate time from admission to mobilization within the first 48 hours in acute stroke patients following the educational intervention for acute stroke staff. Data collected were analyzed using descriptive statistics, and the percentage of change reported. Data that were collected by the ITT for the TCDC was collected through the EHR software, Meditech. The de-identified data were then being recorded, tracked, organized, and analyzed using Excel. The Excel electronic spreadsheets were provided by the TCDC for the staff education DNP Project. The TCDC ensured that all information required for participant inclusion was included in the dataset. The TCDC was provided the patient's account number by ITT in the case that any information was missing or for managing outliers. The account number was not used or provided for the staff education DNP Project. Outlier management was discussed with the TCDC. The TCDC discovered one reason for outliers in previous studies was due to the orders being placed or not placed by certain providers (TCDC, personal communication, February 22, 2017). If there was an outlier found in the staff education DNP project, the TCDC would identify the specific reason before the data were used in the staff education DNP project.

Summary

Best practice guidelines in acute stroke favor early mobilization within the first 24 hours of admission to reduce secondary complications during hospitalization and long-

term disability from stroke. A before-and-after design was used for this staff education DNP project. IRB approval was obtained prior to the implementation of the project. Safeguards were in place to protect patient information. Pre-and-post data were collected by the ITT using the EHR at the organization. This data were analyzed to determine if the educational intervention to promote the use of best practice guidelines by APRNs, RNs, and physicians in the area of early mobility in the acute stroke unit would decrease the time from admission to mobilization. The findings and conclusions of the project are presented in section 4 and were given to the interdisciplinary team. Further dissemination of the findings were provided to the stroke committee and administration to determine future implementation of early mobilization throughout the organization.

Section 4: Findings and Recommendations

Introduction

An identified gap in nursing knowledge was identified at the local organization in the area of early mobilization in acute stroke patients. The purpose of this DNP project was to determine whether an increase in staff awareness in the area of early mobilization as a treatment option for acute stroke deficits would decrease the time from admission to first mobilization in the acute stroke patient population. The practice-focused question for this project asked whether staff education on adherence to best practices in early mobilization would decrease the time from admission to mobilization within the first 48 hours of admission. A staff education design program was used to introduce best practice guidelines and the supporting research in the area of early mobilization in the acute stroke patient population.

A before-and-after design was used for this project. Sources of evidence for this project included the type of stroke, patient's age, the use of tPA, time of admission, time of mobilization order placement, and time of mobilization. A convenience sample of 20 participants from groups both before and after educational intervention was recruited. Evidence for this project was collected through the use of the EHR. The data were analyzed using descriptive statistics. The Excel data analysis tool was used to explore the change in time from admission to first mobilization in participants in the time period before the educational intervention and participants in the time after the educational intervention. The project's key findings, implications, and outcome recommendations are

provided in this section. Contributions of the doctoral project team are also discussed, as well as the strengths and limitations of the project.

Findings and Implications

The practice-focused question for this project asked whether a staff educational program based on best practice guidelines would decrease the time from admission to early mobilization in the acute stroke patient within the first 48 hours of admission. Rosswurm and Larrabee's model was used to guide this DNP project. Rosswurm and Larrabee's model facilitated completion of the assessment, collection, and analysis of the data in the gap in practice and the relationship to the project outcomes. The goal of this project was to decrease the time from admission to mobilization in the acute stroke population by promoting APRN, RN, and physician adherence to best practice guidelines in early mobilization in the acute stroke unit through the development and presentation of an educational intervention (Appendix A). The successful completion of this project was based on the study outcomes of staff adherence to best practice guidelines through the analysis of the study findings, implications, and future recommendations for the local organization (Appendix B).

Project Outcome: Study findings, Implications, and Future Recommendations

Background

Mobilization following an acute stroke is a well-known treatment option for patients admitted to the acute stroke unit. Therapy and an evaluation for acute rehabilitation for continued therapy following discharge from the acute stroke unit are reportable stroke metrics for this organization based on the performance measures

required for hospital stroke certification (Joint Commission, 2019). Two thirds of all stroke patients require at least one form of physical, occupational, or speech therapy following an acute stroke (Joint Commission, 2019). Best practices in early mobilization for acute stroke patients include early out-of-bed mobility within the first 24-72 hours, and research has shown improved patient outcomes when therapy begins within the first 24-48 hours (Maiko et al., 2017).

The purpose of this DNP project was to determine whether an increase in staff awareness on best practice guidelines in the area of early mobilization for acute stroke deficits would decrease the time from admission to first mobilization in the acute stroke patient population. The practice-focused question for this project asked whether staff education on adherence to best practices in early mobilization would decrease the time from admission to mobilization within the first 48 hours of admission in the acute stroke patient population. The educational intervention curriculum was developed to explain the research behind the reportable stroke metrics. The educational curriculum was presented to six physicians, five APRNs, and 24 RNs. The six physicians practice in the ICU and acute stroke unit. Two of the physicians are certified in neurology, psychiatry, and internal medicine. Two are certified as critical care intensivists. The remaining four physicians are certified in internal medicine. The five APRNs are board certified family nurse practitioners. Three of the APRNs work in the ICU and acute stroke unit. Two work only in the acute stroke unit. All of the APRNs have a Master of Science in Nursing. All 24 nurses are registered nurses. Eight have a Bachelor of Science in Nursing, and the remaining nurses having an Associate of Applied Science in Nursing.

The educational curriculum included definitions for the different types of stroke including hemorrhagic, ischemic, and cryptogenic. Information was given on early mobilization with a clear definition of the time frame recommended for mobilization in acute stroke patients. Evidence was presented on the residual effects of stroke, best practice treatment guidelines, supporting research, and the importance of adherence to best practice guidelines to minimize the effects of stroke. Secondary complications of immobility were discussed and staff members were encouraged to communicate ways to reduce the risk of complications following acute stroke. Finally, the available tools in the EHR, such as the stroke order set and the stroke metrics template, were given as a reminder to increase adherence to best practice guidelines.

Data

A convenience sample of 20 participants from both before and after the educational intervention was recruited. The before sample participants were selected randomly from acute stroke patients admitted to the acute stroke unit during December 2017 who met the inclusion criteria. The after sample participants were selected randomly from acute stroke patients admitted to the acute stroke unit during December 2018 who met the inclusion criteria. The Excel data analysis tool was used to calculate the change in time from admission to first mobilization in the before and after participant data groups.

The before sample ranged in age from 43 to 87 years. Thirty-eight percent of the before sample population were female, and 62% were male. The after sample ranged in age from 37 to 92 years. Forty-two percent of the after sample participants were female,

and 58% were male. All of the participants were diagnosed with ischemic stroke and did not meet criteria for tPa administration at the time of admission. All of the participants had similar comorbidities such as diabetes, hyperlipidemia, COPD, asthma, obesity, and hypertension.

Data were collected from the EHR. An initial query was completed to gather the time of admission and the time of the first documented out-of-bed therapy. Admission time was defined as the time of the initial order for patient admission to the acute stroke unit. First mobility was defined as the first out-of-bed activity documented for the patient. The initial EHR query for first mobility was run on the initial physical or occupational therapy documentation of out-of-bed activity. It was then found that the organization's EHR allowed for multiple areas for staff to document first out-of-bed activity. This realization changed the way that data were collected. Data for first mobilization required chart review by hand to determine the most accurate first out-of-bed mobility activity.

All participants were found to have a first out-of-bed activity within the first 48 hours. The percentage of change between the before and after group demonstrated a decrease in time from admission to mobilization of 18.59%. The before sample group had an average time from admission to first mobility of 28 hours and 36 minutes (Table 1). The after sample group had an average time of 23 hours and 17 minutes (Table 2). There was a decrease in average time of 5 hours and 19 minutes. None of the randomly selected participants had to be removed from the study due to being transferred to another facility during the admission, death, or secondary complications that would impact the safety of out-of-bed activity.

Table 1

Before Sample Group

Participants	**Time of admission**	**Minutes to mobilization**	**Documented by**
Participant 1	1036	1,449	Physical therapy
Participant 2	0201	1,891	Physical therapy
Participant 3	1422	1,320	Physical therapy
Participant 4	1437	1,088	Physical therapy
Participant 5	0923	1,553	Physical therapy
Participant 6	0811	1,537	Physical therapy
Participant 7	2345	1,958	Physical therapy
Participant 8	2030	2,202	Nursing
Participant 9	1216	1,212	Nursing
Participant 10	1755	2,416	Physical therapy
Participant 11	1817	2,463	Physical therapy
Participant 12	0945	1,650	Physical therapy
Participant 13	1022	1,600	Physical therapy
Participant 14	2111	2,196	Physical therapy
Participant 15	1355	1,314	Physical therapy
Participant 16	1634	1,358	Physical therapy
Participant 17	1037	1,655	Physical therapy
Participant 18	1432	1,577	Nursing
Participant 19	1417	1,775	Nursing
Participant 20	0437	2,106	Physical therapy
Total	20 participants	34,320 minutes	Mean: 1,716 minutes

Table 2

After Sample Group

Participants	Time of admission	Minutes to mobilization	Documented by
Participant 1	734	748	Nursing
Participant 2	1833	1,041	Physical therapy
Participant 3	1637	1,547	Nursing
Participant 4	0823	1,446	Physical therapy
Participant 5	1011	1,575	Physical therapy
Participant 6	1123	1,424	Nursing
Participant 7	0843	897	Nursing
Participant 8	1937	1,007	Physical therapy
Participant 9	2210	1,446	Nursing
Participant 10	0103	1,883	Physical therapy
Participant 11	1423	1,439	Nursing
Participant 12	1332	1,403	Physical therapy
Participant 13	1812	1,362	Nursing
Participant 14	0855	1,432	Physical therapy
Participant 15	0213	2,022	Physical therapy
Participant 16	0924	1,547	Nursing
Participant 17	0658	1,772	Physical therapy
Participant 18	0857	1,422	Physical therapy
Participant 19	1311	1,063	Nursing
Participant 20	0759	1,464	Physical therapy
Total	20 participants	27,940 minutes	Mean: 1,397 minutes

Evaluation and Recommendations

In the before sample group, the shortest time from admission to mobility was found in patients who were admitted between the hours of 1300-1900, which was an unanticipated finding. The patients admitted during this time frame were found to have therapy orders placed in a timelier manner and received therapy prior to noon the next day, Admission Day 1. Therapy orders placed on admission were not found to be

consistent for patients admitted after 1900. Therapy orders were placed up to 12 hours later with physical therapy being performed on Admission Day 2. In the after sample group, orders for therapy were consistently placed on admission regardless of time. More nursing documentation of out-of-bed activity was found in the after sample group in comparison to the before sample group.

The unanticipated findings of the before sample group led to further investigation of changes that had been made during the time period that could have impacted the study. A stroke metrics table for documentation and a stroke order set were in place during both time periods. However, new APRNs had been hired to work the evening and night shifts. The APRNs were trained to use the order set for all stroke admissions, and this was reemphasized during the educational intervention. The consistent use of order sets may have increased the timeliness of order placement, which would have an impact on when physical therapy took place. All physical therapy in the acute stroke unit takes place during the morning hours. A delay in order placement could delay therapy for up to 24 hours.

The increase in nursing documentation of patient out-of-bed activity was also an unexpected finding. This increase in documentation led to the question whether the educational intervention led to better documentation of patient activity or an actual increase in nurses promoting out-of-bed activity in the acute stroke patient population. Either way, the increased documentation led to the conclusion that the educational awareness led to increased awareness of the need for out-of-bed activity in the acute stroke patient population.

Strengths and Limitations

Noted strengths of the project included the literature available on early mobilization, staff knowledge, and stroke protocols. The best practice guidelines on early mobilization in acute stroke were easily found in the literature review. Although most of the staff did not understand the reasoning behind early mobilization as a treatment option for acute stroke, the information was easily accepted by the staff once presented as it built on the educational foundation they had received in previous stroke education while working in the acute stroke unit. Stroke protocols and order sets were previously in place, which led to increased consistency in order placement and adherence to stroke metrics and best practice guidelines.

Fluctuations in staffing could not be controlled when assessing the two time periods. Although this organization was known to have a nursing shortage during both selected time periods, staffing shortages in physical therapy and the addition of APRNs to the night hospitalist group may have impacted the overall times based on consistency of therapy order placement and personnel available to complete therapy.

EHR documentation irregularity impacted the ease of data collection. Increased effort was made to promote accuracy of the hand collection of the data. Multiple areas in the EHR were searched including nurses' notes, physical and occupational therapy notes, assessment tools, other reports, and scanned documentation from paper charting by sitters and staff members in the acute stroke unit.

Findings

This organization met the performance goal for stroke certification during both time periods. The findings from this DNP project revealed a decrease in time from admission to first mobilization through the adherence of best practice guidelines and consistent order placement by APRN and providers. Increased awareness and improved documentation are critical to the success of a multidisciplinary team approach to patient care in the acute stroke unit.

Implications

Early mobilization in acute stroke is known to decrease long-term residual effects of stroke. By raising awareness and increasing adherence to best practices, admission to mobility times were decreased at the project site. The decrease in time from admission to mobilization may have future impacts on long-term disability outcomes in patients. With the total cost of health care rising, decreasing disability and secondary complications through the implementation of early mobilization may decrease the cost of future treatment.

The local organization strives to promote the use of best practice guidelines and has recently achieved the gold level for stroke certification. The adherence to best practices in the treatment of stroke will benefit the community by allowing stroke patients to receive the best treatment locally without being transferred to a tertiary stroke center hundreds of miles away from their homes and families. Best practices promote the premise that care should be patient centered. Family members and patients become members of the health care team. Through promotion of active participation of the patient

and family, patients are more apt to set reasonable goals and be compliant with treatment plans.

Educational interventions promote adherence to best practice guidelines. The current best practice guidelines in the area of acute stroke show a decrease in residual effects of stroke with the use of early mobilization. By using early mobilization to decrease long-term disability and focusing on patient-centered treatment plans, this project may have a positive impact on social change. Early mobilization decreases long-term disability and the social burden associated with caring for stroke patients who are no longer able to care for themselves independently.

With two-thirds of all stroke patients requiring some form of outpatient services following a stroke, the demand for doctoral trained nurses that can interpret research and transform it into practice has never been greater. Doctoral prepared nurses develop the leadership skills to promote communication between interdisciplinary teams. Interdisciplinary teams and collaboration are essential in the care of acute stroke patients. Collaboration between professionals promotes positive social change through improved patient outcomes (Murphy, Staffileno, & Carlson, 2015).

Recommendations

Adherence to best practice guidelines improves patient outcomes. Although the organization met the current standards of best practice guidelines in the area of early mobilization, the findings from this study showed a need for improvement in three distinct areas. Outcomes from the project found an inconsistency with order placement by

providers, the need for education on the research that supports the current stroke metrics, and consistent documentation on patient care and activities in the EHR.

The timing of order placement for therapy was inconsistent in the before group. The use of admission order sets at the organization is one way to ensure that patients receive the recommended care in a timely manner and that the stroke metrics are being met. Although all orders on the order set may not be appropriate for every patient, the order set can serve as a reminder to providers of the best practices and stroke metrics that should be evaluated in all stroke patients. Education on the use of order sets should be reiterated during stroke meetings, annual staff stroke education programs, and new employee stroke education training sessions.

Stroke education at the organization is completed annually for all acute stroke unit staff. The list of stroke metrics is given to all staff. The research that supports the use of stroke metrics is not normally part of the education that is provided to the staff. Project outcomes showed an increase in documentation of patient out-of-bed activity, and an increase in APRN order sets following the educational intervention in early mobilization. Education based on research is proven to motivate nurses and providers to provide patient care based on best practice guidelines (Jordan, 2000). Based on the findings, providing stroke metrics with the supporting research on patient outcomes may increase the adherence to best practices. During annual training, the stroke metrics and supporting research should be discussed with the staff to inspire adherence to best practice guidelines for better patient outcomes.

During data collection of the before sample population, the patient's first out-of-bed activity was difficult to locate since there were multiple places for this to be documented. An increase in documentation of patient activity was found following the educational intervention. Most of the EHR documentation pages are free text charting which leads to inconsistency in documentation. Templates have been found to include the activities or assessments that are deemed most successful in improving patient outcomes and serve as a reminder to staff to perform the listed items (Laflamme, Dexter, Graham, Hui, & McDonald, 2005). The use of templates in EHR has also been found to decrease time in charting which leaves more time for patient care (Laflamme, Dexter, Graham, Hui, & McDonald, 2005). The organization is aware that the current EHR has no dedicated template or location to document specific patient activities or interventions. The purchase of a new EHR system is planned within the next two years. Until a new EHR is acquired, it is recommended that IT build templates to serve as a reminder to staff of recommended best practices that would also ease the burden of charting.

Contribution of the Doctoral Project Team

During the planning stage of the DNP project, monthly meetings were held with the doctoral project team to discuss the literature review, best practice guidelines, and to gain approval on the educational curriculum. Once the educational intervention was developed, five physicians at the organization who were considered experts in the field of stroke and early mobilization were consulted for approval and feedback. Their knowledge and feedback leant validation to the educational curriculum.

During the implementation phase, delivery of the educational intervention was dependent on the schedule of the APRN and staff of the acute stroke unit. The charge nurses and nurse managers assisted with the coordination of the educational intervention. Synchronizing the educational intervention during annual stroke training and coordinating the meetings with the staff schedules allowed for a smooth delivery of the information in a concise timeframe.

During the collection and analysis of the data, it was discovered that a simple query would not allow for the most accurate data collection. The ITT worked diligently with the DNP student and TCDC to hand collect data to allow for the highest accuracy available. This dedication to accuracy and ethics fostered a greater sense of team dynamics.

Collaboration with the lead neurologist was ongoing during the project. Constructive questioning and feedback prompted more extensive research into the literature and a greater understanding of best practices in early mobilization. With each interaction, a deeper understanding of the importance of this project to the organization was gained.

The members of the DNP project team were also members of the interdisciplinary team that cared for the stroke patients on the acute stroke unit. This project served as a reminder to the members of the importance to adhering to best practice guidelines. It also served as a team building activity that fostered discussions of future projects in the areas of stroke, STEMI, sepsis, and trauma.

Section 5: Dissemination Plan

Dissemination of the findings of this project to key stakeholders was provided to the stroke committee and administration at their regularly scheduled monthly meetings. An oral presentation (Appendix B) was provided in a lunch-and-learn style setting at the request of the stroke committee and administration. The presentation provided the introduction, which included the nature of the project, significance, background, data collection and analysis process, project findings, and recommendations. Time was allocated at the end of the presentation for questions, concerns, and further discussion. This style of presentation promoted open communication and an atmosphere in which questions could be answered honestly. The discussion about this projected opened the door for future projects throughout the organization in the areas of stroke, STEMI, trauma, and sepsis.

Further dissemination of the project findings will be presented at the advanced practice provider local and regional meetings. This project will be used to promote staff education and process improvement projects by other APRNs within the organization. Findings from this project may be transferrable to other units that need to promote adherence to best practice guidelines through staff education.

Analysis of Self

Analysis of Self as a Practitioner

As an APRN in the acute stroke unit, I am expected to keep up-to-date on the latest stroke research and interventions. The APRNs on the unit are role models for the staff. The knowledge that was gained during the research phase of this project helped

validate the expertise that is needed to promote staff adherence to best practice guidelines. Through the promotion of staff education, additional leadership qualities were utilized that were not normally required on a daily basis on the unit. These leadership qualities promoted confidence that was recognized by key stakeholders within the organization. The knowledge gained through the planning, implementation, and dissemination of the project was instrumental in building the confidence and expertise required to be a leader within the interdisciplinary team, which is in line with the DNP Essential VI (American Association of Colleges of Nursing [AACN], 2006).

Analysis of Self as a Scholar

This project was based on an identified problem with adherence to best practice guidelines in early mobilization in acute stroke patients. An extensive amount of research was completed to develop the education curriculum based on best practices. Analysis of the research and interpretation of the data to educate the acute stroke unit staff was required. This project allowed me to discuss the latest stroke research with staff, physicians, key stakeholders, and administrators to demonstrate my knowledge as an expert in the field of early mobilization. Because of this project, I have been assigned additional responsibilities for research and process improvements within the organization by administration and key stakeholders.

Analysis of Self as a Project Manager

When this project began, it was not easy being the project manager. Each project team member who had been selected was a leader in her or his designated area. I quickly learned that projecting self-confidence in my management skills was required to get buy-

in from the other team members. The skills that I had developed throughout the DNP program helped me with communication and collaboration with other team members. I gained significant confidence as a leader when dealing with the different personalities and work ethics of the individual team members. This became especially evident during the data collection phase of the project when faced with obstacles. Being the project manager gave me the self-awareness and critical thinking skills needed for future projects to promote patient-centered care through continued process improvements.

Completion of the Project

The completion of this project has allowed for additional professional development opportunities through collaboration on multiple research projects within the organization in the area of neurology. Throughout the DNP program, I have identified and implemented numerous process improvement projects giving me the confidence needed to complete more complex research projects. Future research projects based on the findings of this project have been planned at the organization with the intention to submit the findings for publication.

The completion of the DNP program has inspired new goals for self-development in the area of leadership and education. Community education on stroke prevention and health promotion is critical in rural areas. Prior to this project, I had never thought about becoming an advocate for population health in alignment with DNP Essential VII (AACN, 2006). Because of the knowledge gained through the completion of this project, I plan to apply to the CDC and the Federal Emergency Management Agency to work in the areas of emergency management and disease prevention.

Summary

The purpose of this DNP project was to decrease the time from admission to mobilization in the acute stroke unit by improving knowledge of best practice guidelines in early mobility using an educational intervention for APRNs, physicians, and RNs. The project outcomes revealed a decrease in time from admission to mobilization following the educational intervention that promoted adherence to best practice guidelines and evidence to support the treatment of acute stroke patients with early mobilization. Other unexpected study outcomes demonstrated consistent use of stroke order sets and increased staff documentation of interventions and activity. Future research is recommended to determine whether the educational intervention impacted the actions of staff in the use of the EHR order sets and documentation or whether this was related to changes in staffing between the two time periods.

This project could have a positive impact on social change. Adherence to best practice guidelines through the use of earlier mobilization in the acute stroke patient population has been shown to reduce long-term disability and increase patient independence in ADL (Chippala & Sharma, 2016). This project could lead to additional research to determine whether the patient length of stay was decreased, whether ADL upon discharge had improved, and whether long-term residual effects were decreased at the 3-month follow-up time frame.

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Appendix A: Educational Intervention Presentation Talking Points

- Objectives
    - Define the types of stroke
    - Define early mobilization
    - Explain the residual effects of stroke
    - Explain the research that supports Best Practice Guidelines
    - Explain the importance of adherence to Best Practice Guidelines
    - Identify secondary complications of immobility
    - Explain the importance of early mobilization for the acute stroke patient
    - Identify tools available in the EHR to serve as reminders of stroke metrics
- Introduction and Disclosures
- Definitions
- Effects of Stroke
- Best Practice Guidelines
    - Supporting Research
    - Importance of adhering to Best Practice Guidelines
- Effects of Early Mobilization
- EHR Tools and Reminders
    - Stroke order set
    - Stroke metrics
    - Stroke education

Summary

Appendix B: Summary of Talking Points of Oral Presentation

Introduction

Early mobilization following an acute stroke is known to decrease the risk of long-term disability and secondary complications of stroke. Early mobilization is considered any out-of-bed activity within the first 72 hours of acute stroke hospital admission. Practice guidelines recommend early mobilization within the first 48 hours of admission for acute stroke patients.

A before-and-after design was used for this staff education DNP project to evaluate whether staff education on adherence to best practices in early mobilization decreases the time from admission to mobilization within the first 48 hours of admission.

Significance

This project could have a profound impact on this organization. Many of the patients who have been diagnosed with stroke admitted to this hospital also have multiple comorbidities that increase the risk for complications that include diabetes, atrial fibrillation, vascular disease, hypertension, hyperlipidemia, or cardiovascular disease. Other complications may arise from the injury to the brain caused by the stroke with immobility being one of the most significant. Immobility can lead to additional complications that increase the risk of death and secondary complications within the first 30 days following a stroke. Many of the complications caused by a stroke increase the longer the patient is left immobile. These complications could lead to an increased

readmission rate. Immobility can be impacted by interventions provided by acute stroke unit staff and have the potential to limit long-term disability associated with acute ischemic stroke (Thrift et al., 2009).

Background

The purpose of this project was to guide APRN, nurses, and acute stroke unit staff in the practice of early mobilization in acute stroke patients while reducing the time from admission to mobilization within the first 48 hours of admission in acute stroke patients. The practice-focused question for this project was whether education on best practices in early mobilization in adult acute stroke patients would decrease the time from admission to mobilization within the first 48 hours of admission.

Data Collection and Analysis Process

A convenience sample population of 20 participants from both before and after the educational intervention were evaluated. The before sample participants were selected randomly from acute stroke patients admitted to the acute stroke unit during December 2017 that met the inclusion criteria. The after sample participants were selected randomly from acute stroke patients admitted to the acute stroke unit during December 2018 that met the inclusion criteria. The Excel data analysis tool was used to calculate the change in time from admission to first mobilization in the before and after participants data groups.

Data was collected from the EHR. An initially query was completed to gather the time of admission and the time of the first documented out-of-bed therapy. Admission time was defined as the time of the initially order for patient admission to the acute stroke unit. First mobility was defined as the first out-of-bed activity documented for the patient. The initially EHR query for first mobility was ran on the initial physical or occupational therapy documentation of out-of-bed activity. It was later found that there were multiple areas where staff were allowed to document patient activity and interventions. Each chart was then reviewed individually for the patient's first out-of-bed activity.

Project Findings

All participants were found to have a first out-of-bed activity within the first 48 hours. The before sample group had an average time of from admission to first mobility of 28 hours and 36 minutes. This was much better than was originally estimated prior to the start of the project. The after sample group had an average time of 23 hours and 17 minutes. There was a decrease in average time of 5 hours and 19 minutes. None of the randomly selected participants had to be removed from the study due to being transferred to another facility during the admission, death, or secondary complications that would impact the safety of out-of-bed activity.

In the before sample group, the shortest time from admission to mobility was found to be in patients that were admitted between the hours of 1300-1900 which was an unanticipated finding. The patients admitted during this timeframe were found to have therapy orders placed in a timelier manner and received therapy prior to noon the next

day, admission day 1. Therapy orders placed on admission were not found to be consistent for patients admitted after 1900. Therapy orders were found to be placed up to twelve hours later with physical therapy being performed on admission day two.

In the after sample group, orders for therapy were consistently placed on admission regardless of time. More nursing documentation of out-of-bed activity was found in the after sample group in comparison to the before sample group.

This organization met the performance goal for stroke certification during both time periods. The findings from this DNP project revealed a decrease in time from admission to first mobilization through the adherence of best practice guidelines and consistent order placement by APRN and providers.

Recommendations

Outcomes from the project found an inconsistency with order placement by providers, the need for education on the research that supports the current stroke metrics, and consistent documentation on patient care and activities in the EHR.

Based on the outcomes, it is recommended that: 1.) all providers be encouraged to use the stroke outset to improve consistency and timely order placement; 2.) when completing annual stroke education, provide the supporting research for the best practice guidelines; 3.) until a new EHR is in place, create a template that promotes easier and more timely documentation of patient care and activities.

Summary

Adherence to best practice guidelines improves patient outcomes. This organization has proven their commitment to using best practice guidelines in the area of early mobilization in acute stroke. And although the stroke unit was already meeting the standard of care in the area of early mobilization, by providing education on the supporting research of early mobilization in the acute stroke patient population, there was still an improvement in time from admission to first mobilization. The education provided also revealed an increase in the use of stroke order sets and staff documentation demonstrating that research based education is an effective tool for increasing adherence to best practice guidelines.