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Improving Advanced Practice Nurses' Knowledge of Cerebral Hemorrhage Assessment and Management

Kimberly Marie Lombardo
Walden University

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Walden University

College of Health Sciences

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Kimberly Lombardo

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Review Committee

Dr. Joanne Minnick, Committee Chairperson, Nursing Faculty

Dr. Amy Wilson, Committee Member, Nursing Faculty

Dr. Geri Schmotzer, University Reviewer, Nursing Faculty

Chief Academic Officer

Eric Riedel, Ph.D.

Walden University

2018

Abstract

Improving Advanced Practice Nurses' Knowledge of Cerebral Hemorrhage Assessment
and Management

by

Kimberly Lombardo

MS, Stony Brook University, 1998

BS, Adelphi University, 1989

Project Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

Walden University

August 2018

Abstract

Cerebral hemorrhages are a type of stroke causing bleeding in the brain from a ruptured brain vessel or an aneurysm. In the emergency department (ED), advanced practice nurses (APNs) play a pivotal role in identifying cerebral hemorrhages. Many APNs lack the skills necessary to assess, diagnose, and manage this type of stroke. A delay in diagnosis of cerebral hemorrhages carries a high risk of morbidity and mortality and can lead to lifelong disability or death. The framework of this project is the Patricia Benner theory of novice-to-expert, which is a 5-step approach designed to strengthen nursing skills with the goal of developing nurses into experts in the neuroscience field. This project addressed whether a validated educational program for APNs in the ED will increase knowledge to improve the assessment, diagnosis, and management of the cerebral hemorrhage stroke patient. A panel of experts were provided a comprehensive educational plan with multiple case scenarios. A 5-point Likert questionnaire was administered and a statistical analysis was performed. Results indicated the panel strongly agreed that the educational initiative increased APNs knowledge and fostered a culture of change for APNs in the ED. Potential implications of this educational module will be considered in satellite organizations impacting APNs' growth and improving patient care throughout the health system. The project determined that the significance of social change included increased APNs' knowledge and advanced professional growth, lowers mortality rates, and promotes an evidence-based quality improvement project.

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Dedication

The doctoral project is dedicated to my spouse and two children who have sacrificed my absence and have fully supported me throughout this journey. In addition, my mother and brother have always stood by my side and have been my biggest fans. Without all of you waiting for me at the finish line I would not have been able to rise to this level of academia and attain this fulfilling degree. My life would be empty without all of you and from the bottom of my heart upon completing the DNP program, I dedicate all the glory in reaching the DNP degree to each and every one of you.

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Section 1: Nature of the Project

Introduction

Cerebral (brain) hemorrhages can be a serious life-threatening event that occurs without any warning. According to the American Stroke Association (2017), stroke affects 795,000 people in the United States per year. Strokes develop in two ways, ischemic (clot that occludes the blood vessel) and hemorrhagic, each having different causes and treatment options. This project focuses on cerebral hemorrhages that occur when a blood vessel in the brain ruptures and causes bleeding. As blood accumulates in the brain it causes swelling and reduces blood supply to the surrounding tissue (Zheng, Chen, Zhang, & Hu, 2016). Patients who have a cerebral hemorrhage may have minor symptoms or become unresponsive. However, once the brain is injured, cells die and there is no cure (Friedrich Flores, & Sehba, 2012).

Early assessment and fast paced identification of hemorrhagic stroke symptoms are critical to save brain tissue and determine the appropriate mode of management and treatment. Surveys in the study site emergency department (ED) were collected from advanced practice nurses (APNs) indicating a 64% lack of stroke knowledge on the critical signs of cerebral hemorrhage (stroke coordinator, personal communication, July 10, 2017). Educating APNs on identifying hemorrhagic stroke in the study site organization will close the knowledge gap and aid in early recognition of cerebral hemorrhage and expediting conventional clinical decisions, which can lower the high rates of mortality and morbidity in this targeted population.

Once diagnosed, close observation and following the condition of the patient is vital to determining if the patient is worsening. The rate of mortality and morbidity are of great concern due to increasing rates of cerebral hemorrhages worldwide (Qureshi, Mendelow, & Hanley, 2009). In the current organization, the rates of mortality have risen over 10% from 2016 to 2017 (stroke RN, personal communication, November 8, 2017).

Comprehensive stroke centers (CSCs) are dedicated centers in medical organizations that deliver stroke care in a multidisciplinary team approach that includes nurses who are educated on stroke on a continuum. The Joint Commission (2018a) has established performance measures including stroke education for nurses, which encompass the two types of strokes. The national focus for stroke education is primarily based on ischemic stroke, with limited nursing educational initiatives for the hemorrhagic patient. The current practice issue focuses on validating an educational tool for APNs in the area of hemorrhagic stroke for the CSC. The project is significant to the nursing field by maintaining current educational requirements and enhancing additional neurological instruction on cerebral hemorrhagic events.

Clinical decision-making on cerebral hemorrhages requires rapid assessment to determine if treatment is warranted. It is essential to assess and identify patients with hemorrhagic stroke and provide proper treatment in a rapid fashion. Time becomes a crucial factor when managing brain hemorrhages. Patients who present with signs and symptoms of cerebral hemorrhage in stroke and encounter a delay in treatment are placed at higher risk for poor outcomes including increased rates of disability, death, and longer

length of hospital stays (Clarke & Foster, 2015). It is critical for APNs who work in a clinical arena to maintain stroke education and be up to date on new data to quickly identify signs and symptoms of cerebral hemorrhage. The proposed project will validate educational material through a panel of experts on cerebral hemorrhage to increase APNs' knowledge and skills that impact the time of initial treatment to enhance patient outcomes.

Problem Statement

Cerebral hemorrhages are medical emergencies requiring urgent assessment and immediate care in a timely fashion. Recent surveys were conducted with APNs in a large health care system in a CSC, and a gap in practice was identified on the lack of knowledge in the assessment of cerebral hemorrhages in stroke. APN's are key members in CSC who address the clinical status of hemorrhagic stroke patients and are first line clinicians to assess for clinical findings. Recognizing stroke signs/symptoms and understanding the cause of stroke is vital to determining management and treatment options to prevent further progression of hemorrhages. Clinical findings of hemorrhagic stroke include one-sided weakness, difficulty speaking, trouble finding the right word, sudden or worsening headache, neck pain, paralysis, facial drooping, memory issues, problems with coordination, balance difficulty, trouble walking, and visual loss or vision disturbances. APNs who know the classic symptoms of hemorrhagic stroke will be prepared to quickly assess and improve patient outcomes.

Cerebral hemorrhages occur at a rate of 13% per year across the nation (Sonni, Lioutas, & Selim, 2014). In the current CSC organization, there is a higher rate of

hemorrhagic stroke compared to the nation. In the current organization, during the last year, data showed a prevalence of 39% of strokes that were admitted in the ED stemming from hemorrhagic events (stroke coordinator, personal interview, July 10, 2017). The present CSC organization has three times the amount of hemorrhagic stroke patients as are seen on average nationwide. The CSC in the organization has highly skilled and trained expert clinicians and advanced technology to properly treat complex cerebral hemorrhagic patients to avoid the high morbidity and mortality rates that occur in this population (Centers for Disease Control and Prevention [CDC], 2014). Therefore, the project holds significance for organizational goals. It is imperative that APNs assess and accurately diagnose the high volume of cerebral hemorrhages.

Standard yearly education is mandated for all nurses in a CSC. According to the Joint Commission (2017), new regulations began on December 1, 2016, for CSCs to meet a higher number of cerebral hemorrhage patients for CSC certification requirements. However, in the current organization, additional nursing education has not been established. Presently, a gap exists due to the lack of nursing knowledge on hemorrhagic stroke. This educational project initiative will focus on validating a hemorrhagic stroke educational module on the most current hemorrhagic assessment skills and information.

Purpose

The nursing profession as a whole is committed to lifelong learning. It is nurses' responsibility to keep abreast of cerebral hemorrhage information in a CSC. Heightening education and validating an educational tool for APNs on cerebral hemorrhages is a key factor to sustain current advances in stroke assessment (Catangui, 2015). The purpose of

the educational materials was to provide an in-depth overview of cerebral hemorrhage, identify the presenting signs and symptoms, and introduce familiarity with current Joint Commission (2017) guidelines. The program validated the PowerPoint presentation targeting cerebral hemorrhage in regard to the early warning signs and assessment skills needed to improve APNs' skill set. The evidence-based practice change will validate and, in the future, disseminate assessment skills and exams on hemorrhagic stroke, view neuroimages correlating to hemorrhages, and reinforce previously known information. The project enables APNs to become experts in the field of stroke, better serve the patient population, and close the knowledge and skill gap in early recognition and treatment. In certain circumstances when patient care is delayed in stroke, the outcomes can be catastrophic. Every 30 minute delay that occurs when a stroke patient arrives in the ED causes a 10% decline in the status (Graves et al., 2013). It is imperative that APNs have the skills and advanced education on hemorrhagic stroke to avoid poor end results that may occur when early care is delayed and compromised due to the lack of knowledge.

CSCs were developed to transform the approach to stroke care, increase patient outcomes, lower morbidity, and minimize stroke health care costs. The Joint Commission (2018a) has certified over 100 CSC in the nation, and part of the performance measures require education for nurses (Lang & Yanko, 2013). Nursing education is an integral element for every CSC that aims to provide state of the art high quality stroke care. Each year APNs are required to obtain stroke education and acquire new knowledge on appropriate guidelines and standards of care. Despite the required

education, a meaningful gap in stroke knowledge was found after a needs assessment was performed in the present organization.

The guided practice-focused question for this project asked whether a validated educational program for APNs in the organization can improve knowledge in APN assessment of hemorrhagic stroke patients in the ED. The project objectives have the potential to address the current gap in practice and contribute to advance nursing skills and stroke training for better understanding of hemorrhagic stroke. Validating nursing stroke education will help amend the deficiency in stroke knowledge and support the educational requirements of the CSC certification.

In addition, the concept of validating the educational program is to increase nursing knowledge, engage nurses, impact positive patient outcomes, and increase the nurse-patient relationship in this complex patient population (Aslani, Alimohammadi, Taleghani, & Khorasani, 2016). The validated educational program change addresses the meaningful gap in nursing practice and aligns with evidence-based medicine to enhance patient care when determining treatment for stroke patients. Quality improvement projects on stroke education will organize stroke care and play a significant role in promoting positive patient outcomes (Gorelick, 2013).

Nature of the Doctoral Project

Strokes, including cerebral hemorrhages, are a burden and an epidemic in the nation accounting for the leading cause of disability worldwide (CDC, 2017a). Accurately assessing hemorrhagic stroke patients may lower the effects of long term disability and positively impact patient outcomes. CSCs in the United States are

established to efficiently triage, treat, and manage intricate stroke patients throughout their hospital course from the ED to discharge. Validating the education plays an integral role in CSCs, which are designated centers that support the need for APN stroke education and inform the staff on current guidelines and standards of care.

The CSC under examination is located on the East Coast of the United States and there is a 119 mile radius between other CSCs who treat acute stroke hemorrhagic patients. The site is located in a geographic area that can accommodate and accept patient transfers from a wide variety of locations, which increases the total number of treated patients. The organization is a 1,000-bed level 1 trauma tertiary hospital including a 16-bed neuro ICU with the capacity to simultaneously treat two acute hemorrhagic stroke patients at once. The CSC is equipped with skilled neuroscience clinicians who are specialized in stroke care and have advanced technology necessary to effectively treat stroke patients in a timely manner.

The general training for APNs in CSCs is limited on hemorrhagic education for the staff in regards to current stroke assessment and guidelines (Edwards, 2006). As a CSC, the organization is accountable to design and provide materials for stroke education. National stroke education programs focus on general diagnosis and lack in-depth approaches to assess and diagnose complex stroke cases (Lyden et al., 2002). The nature of the doctoral project will validate an educational module, which serves to maintain up-to-date guidelines that are established by the Joint Commission (2018a) and are based on evidence-based practice. The proposed project will validate an educational tool so APN educational requirements are met and organizational goals are achieved.

The proposed doctoral project will validate a hemorrhagic stroke PowerPoint educational module with a panel of experts in the neuroscience field in the organization. The educational module also includes two team case scenarios. Integrating case scenarios to the mix of instructional didactic sessions lends itself to increased communication and enhanced learning perceptions (Bonney, 2015). Radiographic neuroimaging will be added for instructional anatomy use and aid in visual learning. The project design will be systematically organized and continually be evaluated to focus on the evidence-based change in nursing practice.

The project is designed to validate an educational tool through a Likert 5-point questionnaire. Likert scales in the form of a 5-point questionnaire will be administered to the panel of experts after thorough review of the educational materials. The panel of experts in the neuroscience field include the stroke director, chief of interventional radiology, stroke coordinator, neuroscience nurse educator, and an APN in the ED. The results of the questionnaire will be statistically analyzed. Upon completion of the project the results will determine if the evidence practice change and validated educational initiative will increase knowledge on cerebral hemorrhages in stroke for APNs in the ED. The development and dissemination of educational programs on hemorrhagic stroke will benchmark evidence-based medicine and advance APNs in the field of neuroscience nursing in the organization.

At the end of the program, a summative evaluation will be conducted. Summative evaluations use the collected data to identify barriers and success of the planned program (Kettner, Moroney, & Martin, 2017). The evaluation will illustrate the

desired outcomes and analyze if project intentions make it worthwhile to pursue the validated educational program. The nursing practice change goal is to magnify the significance of stroke education and augment skills for assessing stroke hemorrhagic patients.

Sources of evidence in the literature support the endeavors for this educational project. Evidence in the literature expresses a need for education on hemorrhagic stroke to properly assess this patient population who requires specialized care (Theofanidis & Gibbon, 2016). The comprehensive literature review included the use of current guidelines developed by the American Heart and Stroke Association, the *Neuroscience Journal of Nursing*, *Stroke*, *Journal of Neurosurgery*, and *JAMA*. I utilized database searches from CINAHL, google scholar, PubMed, and ERIC. The Walden Library was instrumental to search and identify these resources on stroke data. I also conducted Boolean searches with similar terms to expand on the literature. Utilizing Boolean searches aids in identifying the relevance of the topic of interest (Calhoun, 2013). I thoroughly examined the multiple sources in discussion to add to the rigor of the project in meeting primary objectives.

Critically appraising the literature is a vital component for practice changes and gives meaning to decisions made in practice by bridging scientific underpinnings to the clinical arena (Mhaskar et al., 2009). The collection of reliable sources enables APNs to utilize valid and useful information to impact nursing practice. The data collected will allow stakeholders to answer the doctoral question. The validated stroke educational program and approach in analyzing the evidence minimizes the amount of bias and maps

a framework for the practice issue. The evidence benchmarks future proposals to further investigate the current gap in the practice of a lack of hemorrhagic stroke knowledge.

Significance

The American Stroke Association and the Brain Attack Coalition partnered to develop standard guidelines for hemorrhagic stroke care (Joint Commission, 2018b). Following the development of these guidelines, many EDs pushed to increase the door-to-needle time with stroke patients (Morrison, 2007). The door-to-needle time is when patients are screened, diagnosed, and undergo proper protocols to diagnose and treat stroke to determine who will receive treatment interventions to promote better outcomes. APNs significantly contribute to the clinical management and decision making for this critical patient population in the organization by efficiently assessing a hemorrhagic patient. APNs spearhead the initial call in the ED to the stroke team for patients who are identified with stroke signs and symptoms.

The organization is a large health care system encompassing multiple satellite facilities with the ability to transfer patients from other geographic regions through transportation methods including a helicopter or ambulance. Each year the volume of hemorrhagic stroke patients that were evaluated have increased. The stroke coordinator has seen a remarkable increase in hemorrhagic stroke admissions during the period from 2016 to 2017 with close to 400 new cases this year (Ms. S, personal communication, November 6, 2017). Cerebral hemorrhages are broken down into two categories incorporating intracerebral hemorrhage (bleeding in the brain) or subarachnoid hemorrhage (bleeding caused by a ruptured blood vessel from an aneurysm, which is a

bubble of a vessel wall). The prevalence of hemorrhagic stroke over a 2-year time frame in the current organization has significantly increased from 397 to 426. With the increased number of hemorrhagic strokes seen in the organization, the proposed validated educational program can make a significant impact on providing high quality care for the stroke patient population and make a difference in the level of nursing educational competencies and patient outcomes.

Time Period	SAH	ICH	Total
2016	120	277	397
2017	134	292	426

Figure 1: Total number of hemorrhagic strokes in the organization over time

With the dramatic rise in hemorrhagic stroke patients, APNs are critical stakeholders who initially assess patients with stroke signs and symptoms and are the largest group of providers to directly impact patient care (Stretch & Wyatt, 2013). Increasing hemorrhagic stroke knowledge and validating an educational tool will promote the development of experts in stroke care and provide insight to the highly specialized discipline. APNs involved in the educational program have the potential to become leaders in the neuroscience arena and enhance professional growth.

APNs who identify patients with stroke signs must notify the stroke team immediately for further assessment and collaboration. In the organization, the number of stroke codes were measured and showed a significantly high rate of false positive calls (Ms. Doe, personal interview, December 17, 2017). One strategic approach to lower the number of falsely elevated stroke codes is to educate stakeholders. Educational programs

for APNs in the organization on hemorrhagic stroke assessment will change the culture and lower the amount of false positive stroke calls.

The disease process in hemorrhagic stroke can be complex in nature and require many disciplines to address the practice issue. The intent behind the validated educational project was to safeguard APNs in properly recalling signs and symptoms of stroke, activating stroke codes appropriately, and triggering the proper resources for initial treatment (Graves et al., 2013). The stakeholders are a united team and will work instrumentally in collaboration to ensure patients receive appropriate care and to promote positive practice change. The validated educational project will contribute to the nursing practice by advancing skills and increasing stroke education to better serve the targeted population. The project also has the potential to be implemented into other service lines in the organization and the other 23 satellite health care systems; that is, the project may be transferable into similar practice areas.

Validating a hemorrhagic stroke assessment educational program has potential implications for positive social change include altering the minds and behaviors of APNs in the organization. Education can make students keenly aware of their actions and refine the way they think about the critical pathway for hemorrhagic stroke treatment. APNs who are educated on stroke assessment and treatment tools will hone in on the necessary skills to promote positive social change outcomes (Valentine, 2013). Validating educational objectives will change the present culture in the ED.

In today's health care arena, health care organizations are driving evidence-based practice changes to suit the needs of fiscal limitations and promote positive health

outcomes. The cost of stroke, including hemorrhagic events, for the nation can mount to 34 billion dollars per year in direct and indirect costs (CDC, 2017a). The cost of stroke can significantly be lowered when early identification and management occur. Patients being identified in a quick manner and receiving early management can minimize the length and number of hospital stays, which affect hospital expenses. The educational incentive can contribute to increasing utilization performance and improve the delivery and quality of care as a vehicle for positive social change (Salmond & Echevarria, 2017).

Summary

In sum, swiftly recognizing hemorrhagic stroke symptoms is essential for APNs who encounter patients with a suspicion for stroke. In the organization, nurses lack the fundamental skills to properly assess and triage hemorrhagic stroke patients during the critical period of assessment and diagnosis. The overall purpose and intention of the doctoral validated educational initiative is to bridge a gap in stroke education and improve APNs knowledge. The educational construct advances nursing proficiency and skills in identifying hemorrhagic stroke. The program will invest in developing APNs as leaders resulting in them becoming positive influences in a multidisciplinary approach (Fischer, 2017). The program design enhances the advanced practice nursing profession, procures a culture of change, and promotes positive social change while improving patient outcomes.

In the next section, I deeply explore the project development and design and benchmark it from a theorist's framework. The Patricia Benner theoretical model will be discussed as it relates to the validated educational forum being established. Scholarly

resources are closely examined and a literature impacting hemorrhagic stroke outcomes is analyzed. I define and explain local terms that have similar meaning along with defining the roles of each stakeholder and myself as the DNP student. I determine timelines and strategically align them with program objectives. To conclude, the next section builds on the infrastructure of the prior section and elaborates on the evidence-based proposed change.

Section 2: Background and Context

Approximately 1.9 million brain cells will die each minute when there is a delay in the course of stroke treatment (Maggiore, 2012). Nationwide, there is a growing concern about saving time when a hemorrhagic stroke patient enters the ED. Identifying a cerebral hemorrhage is complex due to the disease process and other diagnoses that can mimic stroke signs. APNs in the ED play a vital role when determining a hemorrhagic stroke diagnosis and disseminating the physical findings. The practice problem in the current organization concerns the deficiencies in assessing cerebral hemorrhage patients. My intent with the current DNP evidence-based project is to close the gap on the lack of assessment knowledge and validate education on hemorrhagic stroke. The practice-focused question that addresses this gap is: Can a validated educational program on cerebral hemorrhages for APNs in the ED improve knowledge of assessment of the hemorrhagic stroke patient? Becoming skilled in identifying cerebral hemorrhages will enable APNs to efficiently recognize the signs and symptoms of cerebral hemorrhages and optimize care.

The DNP project will validate education for APNs in the ED on assessment of cerebral hemorrhages with a Likert questionnaire and panel of experts. The primary objective will be to validate an educational program on hemorrhagic stroke and avoid a delay in treatment. Despite the required annual stroke education, there remains a lack of knowledge on rapidly identifying hemorrhagic stroke. When early recognition of hemorrhagic stroke is delayed, a broader problem manifests with the potential risk for hemorrhagic progression and clinical deterioration resulting in poor patient outcomes.

Delaying patient care in this population leads to a broader problem that can impact the length of patient stay and health care expenditures.

Concepts, Models, and Theories

Putting practice changes into action requires insight from strategic models or theories to frame project designs. Evidence-based practice changes necessitate theoretical frameworks to bridge the gap between knowledge and clinical practice (Dracup, Cronenwett, Meleis, & Benner, 2005). The Patricia Benner five-step novice to expert theory was chosen for this scholarly DNP project to unite the knowledge and evidence based practice into clinical nursing practice. The integration of the Patricia Benner theory will strengthen and enhance the development of this validated educational tool initiative by guiding the learner to better understand the project's incentive. The rationale is to use the scientific underpinnings of Benner's theory in the current doctoral project. In addition, the Benner theory will be utilized as a model and framework for program design and methodology process.

Patricia Benner utilized the Dreyfus model as a tool for skill assessment in nursing. The Dreyfus model observed in nursing supposes examination of the novice to the experienced clinician (Benner, 1982). The five levels of the Benner theory include novice, advanced beginner, competent, proficient, and expert. The concept was to establish clinical skill expertise by introduction of education and assessing experience. The doctoral project is specific to advancing nurses' knowledge on cerebral hemorrhage and raising clinical performance and expectations. Benner also incorporated the Heideggerian approach to synthesizing nursing practice with experience, science, and

observations (Altmann, 2007). The approach in the DNP project will address the educational gap and bridge stroke assessment skills with practice to enable APNs to expand on their own level of clinical expertise.

The Benner theory aligns the objectives of the educational project with similar philosophy in nursing practice and expertise (Altmann, 2007). The transition from learning new knowledge to advances in skills and an in-depth understanding of assessing hemorrhagic stroke patients aligns with the five-step approach of the Benner theory. Educational materials developed for this project will encompass new information and reinforce existing approaches to recognize the presence of stroke. The goal of the project will be to validate a tool to transform novice nurses into experts able to recognize hemorrhagic stroke emergencies in the ED. In sum, the project bridges the Benner theory as a strategic approach to embed nursing knowledge and scientific theory to improve clinical outcomes in evidence-based practice.

Definition of Terms

The term hemorrhagic stroke is known as a brain attack. Describing hemorrhagic stroke can be arduous as it has many meanings. The CDC (2017), defines hemorrhagic stroke as when a blood vessel in the brain ruptures (breaks open and leaks) causing bleeding in the brain. Two types of hemorrhagic stroke are subarachnoid hemorrhage (bleeding in the subarachnoid spaces in a certain part of the brain) and intracerebral hemorrhage (bleeding in the brain). Hemorrhages that occur in the brain are evaluated by the location in the brain, and it is essential for APNs to properly recognize symptoms so the underlying pathology or cause of the bleed can be determined.

Advanced practice nurse (APN): A registered nurse who has attained a master's degree in advanced practice nursing and gained advanced skill and expertise in clinical decision making to assess, diagnose, treat, prescribe, and manage patients in the context of a variety of medical diseases and disciplines (Fagerstrom, 2012). The APNs for this project work in the ED of a large health care system with expert services in critical and primary medical care on the East Coast of the United States.

Stroke: An injury to the central nervous system (brain and spine) that impairs a person's functional ability (Sacco et al., 2013). The two forms of strokes are ischemic (clot) and hemorrhagic (bleeding). Hemorrhagic stroke encompasses two types of bleeding in the brain known as an intracerebral hemorrhage and subarachnoid hemorrhage.

Cerebral hemorrhage: A serious condition described as a bleed in the brain. The terms intracerebral hemorrhage, cerebral bleed, and hemorrhagic stroke are interchangeable terms with the same meaning. According to the American Heart and Stroke Association (2017), a hemorrhagic stroke is a vessel that opens up and bleeds filling the brain and surrounding tissue with blood.

Subarachnoid hemorrhage: One form of cerebral hemorrhage that can occur from the presence of an aneurysm. An aneurysm is a bubble off of a blood vessel that has ruptured and caused bleeding in the subarachnoid spaces. The subarachnoid region in the brain are spaces that supply cerebral spinal fluid that bathe and protect the brain. When bleeding occurs from an aneurysm that ruptures, these spaces fill with blood.

Intracranial hemorrhage: Bleeding that occurs inside the brain due to a vessel that bursts. This form of cerebral hemorrhage is the more common of the two hemorrhages and is primarily caused by uncontrolled or high blood pressure (Qureshi et al., 2016). This term is also interchangeable with intracerebral hemorrhage.

Comprehensive stroke center (CSC): Certified hospitals designated by the Joint Commission (2018a) to recognize and treat complex stroke cases to improve the quality of care and afford better outcomes. The centers have clinical experts in the field of stroke with a specialized multidisciplinary team to diagnose, manage, and treat complex cases.

CSC nursing education: The responsibility of the CSC to educate nurses on stroke encompassing hemorrhagic bleeds on an annual basis. It is a requirement that new updates on stroke and reinforcement of stroke information be disseminated (Graves et al., 2013).

Literature Review

An extensive literature search indicated that cerebral hemorrhages are the second most common type of stroke. This type of stroke can be fatal, and many trials have shown that early intervention can improve survival rates and outcomes (Hanley, Awad, Vespa, Martin, & Zuccarello, 2013). When a cerebral hemorrhage patient arrives in the ED, the role of the APN is to prevent a delay in treatment and assess patients by monitoring them with constant surveillance for any sudden change in their condition. APNs must have a keen awareness of these changes and the skills to identify pertinent physical exam findings to avoid a delay in the management of cerebral hemorrhage

patients. Reducing a delay in identifying a change can mitigate the high mortality rates that can escalate during the first day of experiencing a cerebral hemorrhage.

I conducted a focused literature search on cerebral hemorrhages from multiple search databases of studies published from 2009 to 2018. Studies outside the United States were excluded. The incidence of cerebral hemorrhages nationwide are reported to be as high as 67,000 in a given year, and certain ethnic groups such as African Americans and Hispanica have shown the highest incidence (Caceres & Goldstein, 2017). Stroke remains the third leading cause of death in the United States and is the number one cause of physical disability (Lloyd-Jones et al., 2009). Similar to other diseases, the aged populations are more prone to strokes. Koton et al. (2014), stated that at present, the prevalence of stroke across the nation is on a decline, but hemorrhagic stroke continues to have a high mortality rate of 68%, which is a higher mortality rate than with ischemic stroke.

The American Heart and Stroke Association developed evidence-based guidelines for intracerebral hemorrhages that provide a framework and scientific underpinnings for managing this patient population (Hemphill et al., 2015). Once the diagnosis of cerebral hemorrhage is determined, the guidelines are implemented. The guidelines provide formal mapping or an algorithmic method to triage intracerebral hemorrhagic patients from the ED to the ICU or Stroke Unit. The validated project will focus on patient assessment and the current guidelines, which are paramount. Also essential is noting the time when the symptoms began. Collaboration with a neuro team is critical and consists of the following stakeholders:

1. stroke neuroscience nurse educator (DNP),
2. neurointerventionalist,
3. stroke director,
4. ED APN, and
5. stroke coordinator.

Evidence-based practice stroke guidelines were developed in 2003 by the American Heart Association (AHA) to improve stroke care, raise the quality of care delivered, and reduce poor outcomes with strokes (AHA, 2018). The current nursing practice utilizes the guidelines mandated in every CSC and has streamlined the process of identifying stroke to modalities of treatment. Extensive metareviews indicated that stroke guidelines are poorly adhered to and ways to improve strict adherence are necessary to boost the quality of care (Donnellan, Sweetman, & Shelley, 2013).

Researchers have examined different approaches to assess the outcomes of cerebral hemorrhage and lower the high mortality rates. Sreekrishnan argued (2016) that the location and side of the brain (either left or right) of the hemorrhage is a predictor for functional outcomes. After a meta-analysis of over 37 studies on this topic, the results indicated that assessing for quality of life was a better way to measure outcomes in patients using the Glasgow outcome score and the Modified Rankin Scale. Both of these standard tools to assess neurological function are strong predictors for outcomes.

In the ED, APNs rely heavily on advanced skills and training to assess for cerebral hemorrhage in stroke. The National Institute of Health developed the National Institute of Health Stroke Scale nationally known as the NIHSS. The stroke scale is

widely used in the United States and requires little or no training for a novice nurse (Dancer, Brown, & Yanase, 2017). Two algorithms that exist for assessing stroke symptoms that expedite the diagnosis of stroke are FAST and BEFAST. Utilizing these algorithms are an efficient way to assess for true stroke signs and symptoms along with other diagnostic tools. FAST stands for facial drooping, arm weakness, speech difficulties and time to call 911. While BEFAST stands for checking balance, eyes and vision, facial changes, arm weakness, speech disturbance, and time of onset of symptoms. It was determined that the use of the FAST acronym missed 9.9% of the patients with a stroke diagnosis (Aroor, 2017). In addition, Aroor (2017), determined that the utilization of FAST did not accurately depict stroke patients due to the lack of symptoms associated with the acronym. BEFAST encompasses both anterior (front) and posterior (back) circulation strokes and can avoid the mishaps of inaccurate stroke diagnosis. Both acronyms are utilized after suspicion for any type of stroke to determine if a deficit is present requiring immediate attention. The BEFAST mnemonic is integrated into the current DNP project as an efficient and quick assessment tool for novice and experienced APNs to quickly assess for cerebral hemorrhage that will fill one gap in the practice issue.

Despite the guidelines and established assessment tools, hemorrhagic stroke can cause many other complications and death leading to a gap in evidence based practice. In the current organization a gap in nursing education and a deficiency in cerebral hemorrhage knowledge has been identified. To avoid the cascade of poor outcomes it is essential that APN who are on the frontline of patient assessment in the ED be prepared

to accurately diagnose and assess cerebral hemorrhages. In a large qualitative study analysis, multiple medical professionals were interviewed about barriers related to implementing current stroke guidelines. McCluskey, Vratsistas-Curto, & Shurr (2013), pinpointed that knowledge and skills were a barrier to translate evidence into practice. This raises concern for stroke victims as being the number one disability across the nation and the need for a change in the current nursing practice to alter the mindset in assessing hemorrhagic patients in the ED. If APNs can effectively assess and map out the diagnosis and triage to critical environments for cerebral hemorrhagic patients the outcomes would improve and overall enhance patient care with patient satisfaction.

Local Problem

In the local region on the east coast of the United States, according to the CDC, (2017), cerebral hemorrhage rates have diminished by 1.9% over the last seven years per 100,00 residents living in the region but have increased in mortality from 5,961 in 2013 to 6,429 in the year 2015. In an overall evaluation of assessing global stroke services, many countries including the United States, would benefit from additional stroke assessment skills (Tse et al., 2016). There is a needs assessment for stroke skills for APNs in the organization who evaluate the stroke patient population on the east coast of the USA. In conjunction with the needs assessment of the region, the organization identified the same practice issue to increase knowledge of APNs in regards to hemorrhagic stroke and validating the educational tool will aid to lower the statistical data of high mortality rates.

Relevance to Nursing Practice

As the patient age population increase and the amount of physicians decrease, there is an increased demand for APN's in the ED and critical care (Woo, Lee, & Tam, 2017). In the ED, patients who present with hemorrhagic stroke signs and symptoms are initially evaluated by an APN. APNs are on the forefront of patient care and have a responsibility to acquire the necessary knowledge in utilizing clinical judgement and expertise when determining patient decisions. Nationwide there is a driving force for APNs to work to our fullest potential and transform the way we deliver care. To align with these changes, APNs will need to aspire and attain a higher level of knowledge and education to focus on elevating the quality of care around patient's well-being (Salmond & Echevarria, 2017). Overall, the project holds relevance to the nursing profession and contributes to evidence based practice while centering on patient outcomes and satisfaction and meeting organizational goals.

Role of the Doctor of Nursing Practice Student and Project Team

As a transformational leader changing a nursing paradigm in a clinical setting can pose many challenges. After identifying the practice issue, establishing a strategic plan for change, and reviewing the literature, IRB approval was obtained to implement this project. During project execution, my role will be the primary lead stakeholder to develop an educational power point program with team work case scenarios and have a panel of experts validate the educational module. A Likert questionnaire tool will be developed and validated by a multi-disciplinary team consisting of a panel of specialized neuroscience expert clinicians.

As the DNP student, I will disseminate the educational sessions and collect Likert questionnaires after completion of the educational session. Data will be collected by myself and descriptive statistical analysis of the results will determine if the educational sessions were effectively validated. The multidisciplinary project team will evaluate and appraise the evidence of the project and discuss barriers and obstacles that require additional improvement. The team will collaborate and discuss if objectives of the project have been met and effective to increasing the knowledge of the APNs in the ED. Measuring outcomes in an evidence based project is vital in assessing and documenting if the project end results impact quality of care and better outcomes (Fine-Out Overholt et al., 2001). Future endeavors for the project will be considered for dissemination and practice utilization in other satellite organizations across the large health care system.

The current organization is a large health care system that includes a CSC and has state of the art technology as one of the leaders in cerebrovascular disease. Over the years, I have witnessed tremendous expansion of the neuroscience department by staff growth and various levels of specialties within neuroscience patient care arenas. My personal motivation to implement this DNP project stems from a desire to raise awareness of cerebral hemorrhages and avoid the adverse events due to misdiagnosis through a validated educational framework. In collaboration with the stroke team and other key stakeholders in the neuroscience department, it was determined that the current practice issue on the lack of knowledge and assessment of cerebral hemorrhage needs to be addressed. In conclusion, my passion lies to validate hemorrhagic stroke education

and act as a liaison for the stroke team and APNs for education on hemorrhagic stroke.

At present no potential bias exists.

The doctoral educational initiative will incorporate experts in the neuroscience field from the organization who are key stakeholders to validate an educational tool. Effective communication between members will be an integral part of the project. Sources of evidence for this project will be extrapolated from the current guidelines and standards of care in hemorrhagic stroke developed by the American Heart and Stroke Association. The current guidelines provide a framework for evidence based practice on hemorrhagic bleeds (Hemphill et al., 2015). Scholarly neuroscience journals will be explored that are specific to the topic and nature of the DNP validated educational project on cerebral hemorrhage.

Summary

Assessing patients for signs and symptoms of stroke remains a challenge for APNs in the current organization and is aligned with global deficiencies. High rates of mortality are a concern along with sustainability of disability estimates. The literature supports the need for additional avenues to fix the gap on the lack of knowledge and assessment skills to rapidly identify hemorrhagic patients. Guidelines and standard assessment tools need to be strictly adhered to for the quality of care to ascend. The utilization of the Patricia Benner theory and current guidelines are tools and well developed frameworks that lay the foundation for the project design and will stimulate the learner to attain the desired validated program outcomes. To sum, the main concern is the current knowledge level on cerebral hemorrhage in the ED and the approach in

assessing the highly complex stroke patient. The project design utilizing a validated educational initiative and a Likert post questionnaire will be developed to prepare APNs with the clinical manifestations of stroke that present in the ED. The literature was reviewed in section 2 and a needs assessment was identified. In the next section to follow, the research methods, the analysis, evaluation, and project summary will be addressed.

Section 3: Collection and Analysis of Evidence

Introduction

The main problem identified in the current organization located on the East Coast of the United States is the need for additional validated educational materials on hemorrhagic stroke assessment and management. The purpose of this project is to validate hemorrhagic stroke education and strengthen assessment skills, which will expedite admission for patients who exhibit signs and symptoms of cerebral hemorrhage. The construct of the project was delivery of a PowerPoint presentation with teamwork case scenarios and provide a 5-point Likert questionnaire to a panel of experts in the field for validation. The practice-focused question asked whether an educational session that is validated for APNs in the ED can improve knowledge of assessment of hemorrhagic stroke patients. Advancing APNs' education with a validated educational tool will address the gap in cerebral hemorrhage knowledge and minimize delays in treatment, a refinement in stroke care. The educational quality improvement project aligns with national goals set forth by the Centers for Medicare and Medicaid Services (CMS) to improve the delivery of quality care by allowing APNs to practice at the highest level of their academic potential (CMS, 2016). In addition, the organization is driven to heighten validated educational forums to increase the quality of care provide by APNs. The mission will be to change the current behavior of cerebral hemorrhage assessment and elicit a positive social change.

Methodology, Analysis, and Synthesis

The targeted organization is a large tertiary level 1 trauma CSC located in the United States on the East Coast. According to the stroke coordinator, at least 1–2 stroke patients are assessed and screened for signs and symptoms of stroke on a daily basis (Ms. S, personal interview, November 6, 2017). The focus of the DNP project is to validate hemorrhagic stroke education for APNs who are the initial providers assessing patients in the ED presenting with signs and symptoms of cerebral hemorrhage. The validated educational program is designed specifically for APNs who staff the ED. The APNs will contribute to the project change by improving patient outcomes. The project will afford a higher level of utilization of the APNs' neurological skill set (Woo et al., 2017).

The methods designed for the validated educational initiative are logical and allow for stakeholders to easily understand the program plan design. Strategic models aid in guiding evidence-based practice changes and form a step-by-step process for implementation. The Patricia Benner staged model is a five-step approach that will be utilized in this project change. The five-step approach incorporates patient care and quality improvement through discovering new knowledge, summary of the evidence, translating evidence in to practice, integration of the change, and evaluating the process (Schaffer, Sandau, & Diedrick, 2012). The theory fits with the objectives of the project and will contribute to the strategic planning of this quality improvement program.

The PowerPoint presentation is developed with an introduction on neurological anatomy following a descriptive explanation of the pathophysiology of cerebral hemorrhages, including intracerebral and subarachnoid hemorrhages. An in-depth view

of neurological examination and findings will be explained. The mnemonic BEFAST will be discussed; this aligns with the acronym used by the organization. The National Institute of Health Stroke Scale is a validated tool established by the American Heart and Stroke Association that will reinforce neurological assessment skills during the didactic sessions. The organization's stroke contact information that is activated once a hemorrhagic stroke patient is identified will be included, and two mock trials of team case scenarios will be integrated.

The validated educational module will be evaluated by a panel of experts for program effectiveness and support the evidence-based practice change. Validating an educative tool involves measuring the reliability of the data collected (Alyusuf et al., 2013). The five-point Likert questionnaire will be administered and analyzed. Each question will address the educational activity and evaluate the objectives of cerebral hemorrhage materials addressed in the program through ratings on a scale of 1 (strongly disagree) to 5 (strongly agree) in a clear and concise format.

To ensure ethical protection and confidentiality for the participants, the project was presented to the Institutional Review Board (IRB) at Walden University for approval prior to the beginning of the program. Due to the nature of this project, it qualified for expedited board review. For this specific project change, a consent from participants will not be required. Likert questionnaires will be collected in a confidential manner without bias and require no personal health information.

Analysis and synthesis of the data will be performed once the Likert questionnaires are collected at the end of the session. It will take approximately one

week to conduct the descriptive statistical significance analysis. Descriptive statistical analysis is commonly utilized in data analysis to add rigor to the scientific underpinnings of the evidence-based practice change (Thompson, 2009). Over the course of project, the program will be evaluated on a continuum and reevaluated upon completion of the program change. If positive outcomes present after the analysis, future endeavors will be to extend the project change to other APN disciplines in the large health care system.

The following process addresses the summary and flow for a sustainable project change:

- Establish a project change: A needs assessment was identified and the current literature reviewed.
- Lead stakeholder will be the DNP student: The lead DNP student will coordinate the project and implement the validated education program. During development of the project, multiple disciplinary teams consisting of end users (APNs), IT, stroke coordinator, neuroradiology physician, stroke neurologists, neurointerventionalists, ED physicians, and a neuroscience educator will collaborate in their level of expertise to align the goals of the project and organization.
- Integrate theories and models: The Patricia Benner theory will provide the framework for implementing change.
- Develop a time line: Time lines keep the project on target with small predicted goals and frequent evaluations.

- Motivate and cultivate change: Effectively communicating and interdisciplinary collaboration through routine meetings and discussing identifiable barriers cultivate change.
- Educational materials: Educational materials will be developed by the student with the expert panel.
- Validation of an educational tool: Expert neuroscience stakeholders will validate an educational tool including a stroke neurologist, neurointerventionalist, stroke coordinator, clinical neuroscience educator, and an experienced APN in the ED.
- Roll out and implement the proposed project change.
- Collect the Likert questionnaire.
- Statistically analyze the data: Analyzing the data will be an integral aspect of this quality improvement program and will identify statistically significant findings of effective educational initiatives (Portela et al., 2015).
- Conduct summative and formative evaluation: This evaluation allows for engagement with the learner and instructor to conduct strategic evaluation of judgments and feedback of the program to elicit approaches to make impactful changes in the future. (Chappuis & Chappuis, 2005).

Summary

The evidence-based practice change will promote advanced skills and early identification of signs and symptoms of stroke. The methods, analysis, and synthesis developed for the project are sequential with a broad understanding of the proposed

project. APNs play a crucial role in recognizing stroke, and with a newly developed validated education tool on cerebral hemorrhages, APNs can significantly contribute to initiating rapid treatment decisions. According to Middleton et al. (2015), each stroke patient with a 15 minute delay in treatment had an additional month of disability. Therefore, the sources of evidence utilized reflect a strong correlation to EBP and implicate the need for projects of this nature. Early recognition of stroke can prevent the dangers of prolonged disability and lengthy hospital stays. Additionally, APNs in the ED who streamline workflow in triaging stroke patients will improve timely access to care for patients and raise the standards for other quality improvements.

In this section I described the methodical approach to the DNP project and capstone improvement process. I presented the timeline with specific criteria for meeting project goals. The sources of evidence are in alignment with the focus of the desired outcome and practice-focused question as to whether a validated educational program for APNs in the ED can improve knowledge of assessment and diagnosis of cerebral hemorrhagic stroke patients. The evaluation of the educational program will potentially reveal that the program is effective and serve to develop a consistent and recurring avenue for educating future APNs in the ED. The next section will include the statistical findings, evaluation, and proposed dissemination plan.

Section 4: Findings and Recommendations

Introduction

Cerebral Hemorrhages can be a life threatening event with over 20% of patients declining within several hours of presentation (Dastur & Yu, 2017). In addition, Dastur and Yu (2017), claimed that early intervention is key to increasing any chance of survival. Therefore, it is imperative for APNs in the ED to have assessment skills and knowledge to identify patients who exhibit signs and symptoms of cerebral hemorrhages. In the organization, a needs assessment was conducted and a deficit in the knowledge and assessment skills of cerebral hemorrhage was identified in the targeted nursing population. An educational initiative project was developed to answer this question: Will a validated educational module increase APNs' knowledge of assessment and management of cerebral hemorrhages in the ED?

In compliance with Walden's Doctoral Educational Staff Manual, I contacted the IRB at Walden and obtained approval to formally conduct this project of significance. Obtaining approval from an accredited IRB is a vital step for conducting and publishing quality improvement projects in a safer health care environment (Patel, Stevens, & Puga, 2013). The current organization where the project was conducted did not require any IRB approval, allowing for exemption due to the nature of the project and absence of exposing patient contact and health information.

A multidisciplinary team of five experts in neuroscience in the organization were established to validate an educational session on a cerebral hemorrhage PowerPoint program. The team included a stroke director, stroke coordinator, chief of

neurointerventional radiology, neuroscience nurse educator, and an experienced APN in the ED. Each member of the panel were invited to attend a PowerPoint and case scenario presentation that I developed. Having a diverse multidisciplinary team of experts to review the educational module uniquely contributes to this project, providing a broad approach with a variety of expertise and opinions to assess the educative materials (Fong et al., 2015). The expert multidisciplinary panel was strategically chosen to enhance the goals of the project to increase APNs' knowledge by offering valuable information that will impact high quality patient care.

After delivering the rigorous PowerPoint with case scenarios to the panel of experts, a 5-point Likert questionnaire was administered. The questions on the 5-point Likert form addressed the value and significance of the educational module and substantial stroke materials to advance assessment skills. The Likert scale included 6 questions to address the gap of nursing knowledge of cerebral hemorrhage. Each question was rated from 1 (strongly disagree) to 5 (strongly agree). The questionnaire collects data and displays the results in a reliable way to present metrics validating an educational module and performance (Sullivan & Artino, 2013).

Findings

The questionnaire was administered after the educational module was presented to the panel of experts and collected in a confidential manner through an electronic form. The end results of each question were statistically analyzed, calculating a mean score. Overall the panel strongly agreed that the educational program addressed the practice issue on the lack of knowledge and aligned with evidence-based clinical practice. After

the descriptive statistical analysis of data, the practice issue of cerebral hemorrhages was easily understood, concise, and prepared the APN for rapidly identifying and assessing a hemorrhagic patient in the ED. Furthermore, the collaborative team of experts voiced recommendations to enhance the value of the educational program. The feedback provided by the team afforded an opportunity to strengthen the project in achieving the project goals and attaining optimal outcomes (Wiggins, 2012).

I analyzed the 5-point Likert questionnaire outcomes by descriptive statistics and measured them by using a standard mean calculation. The project revealed statistically significant results to strongly impact APNs' knowledge of cerebral hemorrhage. Overall, each expert on the panel strongly agreed that the educational materials addressed the deficiency of stroke knowledge with APNs in the organization. The information provided in the PowerPoint was displayed in a format easy to understand and conveyed the significance of assessing and managing hemorrhagic stroke patients. Members of the panel provided various comments that were constructive and built on the scientific foundation of the project.

The panel responses revealed the project is supported by evidence-based practice and the educational material strongly supports bridging the evidence and clinical practice. Utilizing supporting evidence in clinical arenas with front line staff leads to better outcomes (Jeffs et al., 2013). With positive feedback and statistically significant results, the doctoral evidence-based project contributes to promoting nursing excellence and quality patient outcomes.

A display of basic to advanced educative tools were incorporated into the module. The Patricia Benner theory displays a five step model approach from novice, advanced beginner, competent, proficient, and evolving into experts in the field. The team discussed the importance of the underlying framework of the project. The project covered teaching strategies from basic neurological assessment skills to advanced critical thinking, which aligns with the Benner theory utilized in the project design. The educational module promoted understanding of cerebral hemorrhages, and combined with Benner's theory-based practice through education is highly beneficial to the nursing discipline (Lutjens & Horan, 1992).

The primary outcome of the project was increased APN knowledge and assessment skills to rapidly identify signs and symptoms of hemorrhagic brain bleeds. Other relevant outcomes were attained such as lowering hospital costs that will benefit the current organization. Cerebral hemorrhage patients often suffer from neuromuscular weakness when assessment is delayed, leading to longer intensive care unit stays and raising the overall health care cost of each admission (Parker, Sricharoenchai, & Needham, 2013). Secondary outcome measures for this project include impacting a social change for the nursing profession, lowering the incidence of poor patient outcomes, and minimizing hospital financial expenditures in this patient population.

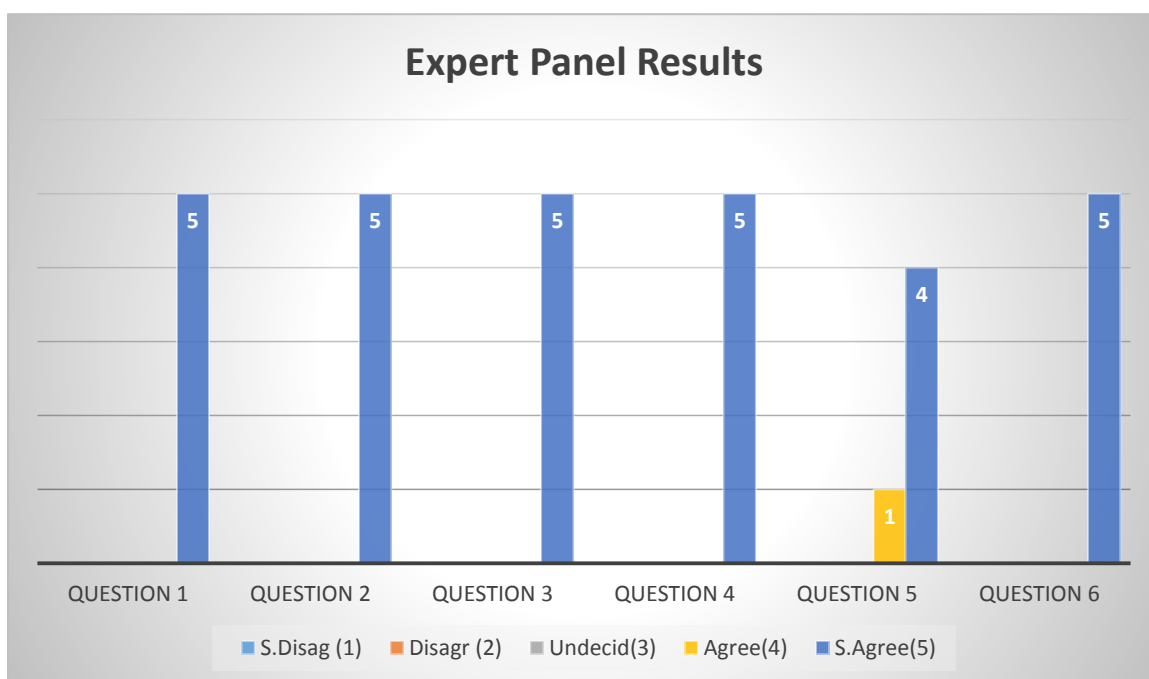


Figure 2. Display of analysis of the 5-point Likert questionnaire.

Recommendations

After the educational initiative was presented, the team expressed their viewpoints and perspectives to validate and improve the materials demonstrated. PowerPoint presentations are common methods to communicate educational materials. I chose a PowerPoint presentation for this project because the program could reach a large audience and be easily disseminated. However, introducing a webinar for cerebral hemorrhage educational sessions was highly recommended by the core team. Webinars capture larger audiences and are easily accessed 24 hours a day for staff availability (Ms. G, personal communication, June 4, 2018). Insights from the panel of experts included the suggestion to include anticoagulation therapy and blood pressure monitoring during the initial assessment

and intake. Blood pressure parameters are vital for assessing cerebral hemorrhage patients (Sonni et al., 2014). Additional suggestions related to the Joint Commission (2017) requirements for an APN to be incorporated into the stroke team, making this project's purpose more substantial.

Nonetheless, it would be beneficial to incorporate a larger and more diverse group of APNs to receive this educational tool. In other disciplines across the large health care system, APNs are exposed to assessment of patients with signs and symptoms of cerebral hemorrhage. Establishing and sustaining a comprehensive stroke center in the organization requires APN staff to be educated on a continuum and become experts while rendering care (Ringelstein et al., 2013). Additionally, each certified comprehensive stroke center is responsible to report yearly education for APNs to the Joint Commission (2017). The validated specialized cerebral hemorrhage educational program is significant to continuing education on a yearly basis and supports educating nursing experts in the field. Future recommendations would be to extend the program to the other satellite health care systems in the organization and expand the original initiative nationwide.

Contribution of the Doctoral Project Team

The project team was led by the doctoral student. The core panel were chosen for their expertise, clinical background, leadership ability, and knowledge on content. The two physicians on the panel are renown in the field of Neuroscience and the stroke coordinator and APN from the ED have over 20 years of combined neurology and critical care experience. The project team is committed to organizational goals and a mission to improve the quality and outcomes of hemorrhagic stroke patients. The organization is a

comprehensive stroke center which aims to assess, manage, and treat complex cases in a large geographic territory on the north east coast of the nation.

Interdisciplinary collaboration was a vital aspect to the workflow of this educational initiative. Catangui (2015), concluded that the use of interdisciplinary teams is vital in program designs to reach educational goals and increase positive patient outcomes. The experts were instrumental in validating this educational tool to increasing knowledge for APNs. Constructive comments and return feedback were regarded as valuable input received by experienced professionals on the panel.

Enhancing Social Change

The doctoral educational initiative project is paramount and creates an introduction to a variety of positive social changes. The approach and framework of the project alters the APN mindset in early assessment of cerebral hemorrhage signs and symptoms. The project pioneers APNs to become experts in the field in neuroscience and exposes reinforcement of old and new knowledge to increase and master neuro assessment skills. Expert opinions guided the significance of the project and further developed validation of the module for future use. The end users were engaged who initially assess cerebral hemorrhage patients and identify the need for imaging, provide management, and select appropriate treatment modalities.

Presently, there is a constant revolving door in the nursing profession in relation to health care policy, guidelines, standards of care, and new approaches to evidence based practice changes. For APNs to keep abreast of these evolving changes education becomes paramount. Nursing education is a lifelong commitment which fosters

professional growth, cultivates discipline, and remains an ethical concern towards our career (Read, Betancourt, & Morrison, 2016). Utilization of the educational program will enhance the knowledge and skill set of APNs in the ED setting of cerebral hemorrhage (Stehouwer et al., 2017). The educational module empowers APNs to transform their mindset and effectively meet improved ways to attain human needs leading to positive social changes (Patil, 2012). The current doctoral project boosts knowledge and professional growth of the audience aligned with a culture for change.

Social changes that impact patient care run parallel to the doctoral project goals and involve lowering the high rates of morbidity and mortality. According to Nguyen et al. (2016), aggressive management from early assessment of cerebral hemorrhages can spiral the high rates of morbidity and mortality in a downward fashion. In the vast literature, support of early intervention of cerebral hemorrhage patients can lower death rates and minimize physical disability. The current project is vital to improve outcomes in this patient population and leads to transforming quality care through evidence based practice changes (Silver et al., 2016).

Operational costs for the doctoral project were minimal and patient outcomes show favorable financial gains for the organization. The execution of the project comprised of internal resources and leadership support to minimize financial expenses. The cost of the power point, project supplies, and capital expenses were nominal without interfering in allocated funds of the service budget. The cost of paper for the project was the only expense allocated from the neuroscience service line. The panel of experts volunteered their time and the educational module was developed by the doctoral student.

Besides maintaining a low project budget, cerebral hemorrhage patients who are treated and assessed early can have lower rates of disability and reduce hospital costs (Burns et al., 2018). By intervening early and properly assessing cerebral hemorrhage patients the outcomes effect positive social changes.

Strengths of the Project

The current evidence based project change was to validate an education module and recognize early warning signs and symptoms of hemorrhagic stroke through increasing knowledge and skills. The educational practice change afforded an opportunity for APNs to expand their skills and knowledge as well as update national hemorrhagic guidelines and reinforced standards of care. The educational program was strategically developed to be a timely project.

Besides increasing knowledge, the project's strong point is to change the current paradigm of identifying cerebral hemorrhagic strokes. Understanding the clinical features and mimics of hemorrhagic stroke is crucial in the complex targeted patient population for improved outcomes. The delivery of the educational module refines staff development. The goals of the project met expectations for the role of APNs to evolve into experts which is needed for stroke care to promote better practices and outcomes (Edwards, 2013).

The doctoral student driven project utilized an arrangement of a power point and case scenario educational module. The use of applying case scenarios into an educational forum strengthens the learner's ability for an in depth understanding of the materials and aids in applying skills (Trujillo-Jenks, 2014). The setting engages APNs to interact and

increase inter-professional communication. The benefits of the power point design of the doctoral project stimulates the audience to engage in a participatory way to foster clinical reasoning which advances nursing practice (Latif, 2014).

Additionally, an apparent strength of this project is the group of experts who participated to validate the education of cerebral hemorrhages. The stakeholders incorporated into this effective educational endeavor where vital team members who strengthened and enriched the gap in the health care organization. The team members are vested in the quality of hemorrhagic stroke patient care from an evidence based practice model. According to Hoffman et al. (2010), each expert who shares common goals and a connection to improve outcomes in a specific patient population will stimulate and sustain engagement of the team.

Limitations of the Project

In the current organization, APNs play a major role in assessing patients on distinct service lines with signs and symptoms of cerebral hemorrhages. Limitations presented in this project include the narrowed focus of the ED advanced nurse practitioner. Expanding the educational module to many other APNs throughout the organization would increase knowledge and improve patient outcomes throughout the large 1000 bed tertiary health system. To magnify the impact of this doctoral project a total of two hundred APNs exist in the organization which would impact the significance and amplitude of the project.

The use of a 5-point Likert questionnaire is a valid instrument to assess the effectiveness of program changes. The Likert questionnaire is utilized in educational

research and is a common and reliable tool (Joshi et al., 2015). However, the 5-point Likert scale remains controversial and raises the question if a 7-point Likert scale questionnaire would be more beneficial. Responses such as strongly agree and agree can be difficult to analyze and interpret. Calculating the normal distribution of results from a 7-point Likert scale may increase the magnitude of the statistical significance and end results (Bishop & Herron, 2015).

In addition, the advanced practice nursing staff in the organization can be resistant to change presenting another challenging obstacle. Sustaining and engaging project changes can be a challenging task for health care leaders. According to Gesme and Wiseman (2010), shifting the paradigm in this project to alter the current assessment strategies require a culture of change and effective leadership. In order to overcome this limitation in the future, nurse leaders must engage in staff education from an innovative approach. Creating educational modalities that stimulate end users is an important element to sustain motivation. As an educator and transformational leader one must play a pivotal role to understand the audience and values in order for educational programs to be effective (Salam & Alghamdi, 2016).

Limitations during project execution included a challenge to display the power point and present the information to the panel of experts. Setting aside time for education in the organization was an obstacle and adherence to schedules delayed program development. As a leader, the project was strategically planned and efforts were made to effectively use time in an efficient manner (Said, 2014). Presenting the educational

module requires leaders to be accommodating and flexible to capture audiences at a given time.

Section 5: Dissemination Plan

Disseminating evidence-based quality improvement projects is essential for impactful changes to occur. The doctoral project was focused on disseminating knowledge to frontline APN staff in the ED. The project study included the purpose of the study, the problem in practice, methods, project results, and implications.

I selected case scenarios and a PowerPoint presentation for disseminating this valuable project. Incorporating case scenarios deepens the learner's ability to critically think, imparts a clear understanding of the information provided, and enhances communication regarding the scientific underpinnings presented (Latif, 2014). The ED is equipped with a large conference room suitable for educational presentations, accommodates up to 100 participants, and is secluded from the main ED. The quiet environment where the educational project was disseminated encouraged multidisciplinary collaboration and effective communication. Utilizing these strategic methods for disseminating information can enhance basic training and advance concepts while engaging with assessment skills (Villiyate, Robinson, & Goodman, 2012).

Analysis of Self

The doctoral project provided an opportunity to display my knowledge as a pioneer in the field of cerebral hemorrhages. Working with an experienced panel of experts in the organization aided in developing my role as a transformational leader. Today, there is growing awareness for leaders to extend their role from the clinical arena to economic and quality of care issues in order to attain better outcomes (Salmond &

Echevarria, 2017). As a novice DNP student, the project implemented has advanced my role as a student to an advanced beginner and robust leader in the field of neurosciences.

The doctoral degree prepares students to appraise evidence and identify practice issues that will enhance outcomes and develop strategies to translate evidence into the clinical arena (Brown & Crabtree, 2013). The current educational project enabled me as a student to search academic literature relevant to the gap in nursing practice, which was a lack of knowledge of cerebral hemorrhages among APNs in the ED. The forum enabled me to introduce a scientific foundation to the environment inside a CSC where clinical decision making in treating complex cases is vital. Being a scholar enabled me to empower APNs to emerge as experts in the field.

The DNP American Association of Colleges of Nurses (AACN) Essentials play a significant role in the profession of nursing and are core competencies that have been embedded in this DNP curriculum. The core competencies of the DNP AACN Essentials are specific and focused on the APN in regard to health care policy, administration, academia, and leadership roles (AACN, 2006). In relation to this doctoral project, the DNP AACN Essentials prepared me for an academic teaching role. The DNP project has heightened my professional growth as an experienced APN in the specialty of neurosciences and established interprofessional collaboration among accomplished leaders in the current organization.

Summary

In summary, this DNP project holds significance to the nursing profession and promotes quality for the current CSC organization. The use of this educational module

enhances APNs' knowledge and improves patient outcomes. The project provides learners the ability to act quickly during emergencies in the ED in regard to patients with cerebral hemorrhages. The construct of the program affords a meaningful approach to evidence-based practice through the analysis of stroke literature and guidelines that support the project's endeavors. The doctoral project was focused on strengthening academic partnerships and professional growth for the targeted APN population in the ED inside the organization. The educational project implemented a multidisciplinary team approach to advance the nursing profession and align with the DNP AACN Essentials.

In conclusion, the project question asked if a validated educational module of cerebral hemorrhages will increase knowledge on assessment and management for APNs in the ED. The results and outcomes of the doctoral educational initiative project answered this question by showing a significant positive outcome. The project increases APNs' knowledge and may mitigate the additional costs of extended hospital stays when rapid identification and early intervention are implemented. According to McKinney, Cheng, Rybinnik, & Kostis (2015), CSCs are shown to have better patient outcomes for cerebral hemorrhagic patients when their symptoms are recognized in the early acute phase. Increasing awareness of this disease process and following current modalities to assess cerebral hemorrhages are key factors for APNs in the ED.

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Appendix A: Early Identification of Cerebral Hemorrhages

Early Identification of Cerebral Hemorrhages

Kimberly Lombardo

Inside the Organization

- Gap in nursing stroke knowledge
- 64% of nurses do not recognize stroke signs and symptoms
- 39% of strokes evaluated are intracerebral hemorrhages (ICH)
- ICH is the forgotten stroke due to the focus on ischemic territory
- High stroke admission rates (1.5 stroke cases a day)
- Designated stroke center and JC Stroke certified
- Organization's goals is to improve quality of stroke care

Comprehensive Stroke Center (CSC) Requirements

- Necessary resources to treat complex stroke patients
- Expert team of neuro-interventionalists available 24/7
- Trained and certified stroke nurses
- Availability of Tele stroke
- In 2016 The JC mandated CSC to have higher cases of ICH (JC, 2017)
- Mandatory annual 8 hour nursing stroke education

Change of Culture

- Past
 - Average number of hemorrhagic events (15%)
 - Required 8 hours learning module (APEX)
 - No focused stroke education for APN
- Current
 - Increased number of hemorrhagic events and on the rise each year (39%)
 - Additional education needed to close the gap in knowledge
 - Focused for APN and applies team case scenarios
 - Updated information

Defining Stroke

Hemorrhagic

- Ruptured blood vessel causing bleeding in the brain
- Accounts for 15 to 20% of all strokes (Sonni et al, 2014)
- Highest mortality rate of stroke occurrence

Ischemic

- Clot disrupting flow blood in a vessel inside the brain
- Accounts for 80 % of all strokes (Sonni et al, 2014)

Hemorrhagic Facts

- Affects 795,00 people a year in the USA
- ICH has higher mortality and morbidity rates than ischemic stroke
- Overall health care costs of stroke are 34 billion dollars/year
- Every 30 minute delay in diagnosis leads to 10% physical decline
- 1.9 million brain cells die each minute treatment is delayed

(AHA/ASA, 2017)

Hemorrhagic Stroke Statistics

- **Mortality**
 - High mortality rate (Safatali et al, 2016)
- **Cost**
 - Cost varies (Wang et al, 2014)
- **Disability**
 - Mobility is lowered by ½ in survivors (CDC, 2014)



Two types of hemorrhages

ICH Intracerebral Hemorrhage

- Usually caused by uncontrolled HTN
- High mortality rate
- Twice as common as SAH
- More common in men

SAH Subarachnoid Hemorrhage

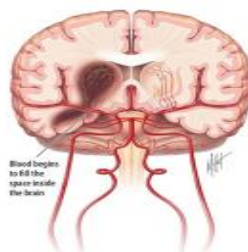
- Usually caused by ruptured aneurysm
- 40% of patients die after a rupture
- No screening for brain aneurysm
- More common in women

Location of Hemorrhage

- **ICH-- Intracerebral Hemorrhage**
- Blood vessels inside the brain bursts
- Blood accumulates in the brain parenchyma and may evolve into the ventricles and subarachnoid spaces (Aronowski & Zhao, 2011)
- Most common locations are basal ganglia, thalamus, midbrain or pons (Manoel et al, 2016).
- **SAH—Subarachnoid hemorrhage**
- Blood pools in the pial and subarachnoid space after injury of vessel
- Can be caused by other vascular abnormalities

Neuroimaging (Cerebral hemorrhage, n.d.).

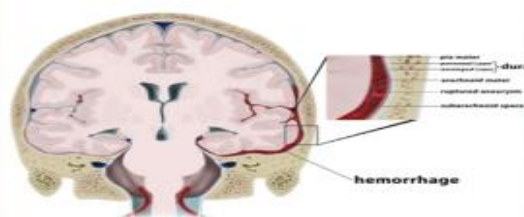
Intracerebral Hemorrhage



SAH (Subarachnoid hemorrhage, 2018)

➤ Bleeding into the subarachnoid space (space between pia & arachnoid layers) where blood vessels lie & CSF flows

Subarachnoid Hemorrhage



Current Hemorrhagic Guidelines

- Developed by the AHA/ASA
- Trained personnel (APN) required to diagnose and treat cases
- Presently APN stroke education is an elective 8 hour session
- APNs begin neuro assessment and orders with head CT
- APNs in ED initiate BP control and lowering agents
- Frontline ED personnel (APNs) converts anticoagulation
- Constant surveillance of hemodynamics and possible seizures
- Glucose, temperature, aspiration, and cardiac monitoring
- Transfer to Neuro-Critical care area

(Hemphill et al, 2015)

Signs and Symptoms

- One sided weakness
- Difficulty speaking
- Word finding difficulty
- Headache/ Neck pain
- Facial droop
- Memory change
- Trouble walking
- Balance & coordination issues
- Vision changes

Seconds matter...

- **Recognize risks**
 - Age, gender, smokers, co-morbidities
- **Hemorrhagic strokes can be treated**
 - Act fast and initiate aggressive early management
- **Recognize signs stat**
 - Sudden onset of neurological change, WHOL

Hemorrhagic Mimics
(Yew & Cheng, 2009)



Assessment Tools

- **BEFAST**
Rapidly identifies stroke signs
Includes both posterior/anterior circulation findings
No certification necessary to perform
- **NIH Stroke Scale (NIHSS)**
Measures level of stroke severity
Performed by trained stroke staff on code team
0 = no signs of stroke up to 42 = severe disability

Mnemonic: BEFAST

- Developed by Intermountain Healthcare

- **B**alance
- **E**yes
- **F**acial
- **A**rms
- **S**peech
- **T**ime



("BEFAST was developed by Intermountain Healthcare, as an adaption of the FAST model implemented by the ASA. Reproduced with permission from Intermountain Healthcare. Copyright, 2011, Intermountain Healthcare").

Continued Assessment.....

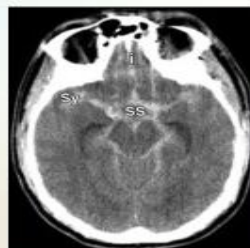
- **Initial**
First 60 minutes
 - ABC
 - Neuro exam
 - BP
 - Head CT
 - Timing
- **Continuous Monitor**
Between 1 -20 hours
 - Neuro exam
 - Look for s/s secondary bleed
 - VS
 - Early surgical evaluation
 - Dysphagia

(Manoel et al, 2016)

Head CT Non-Contrast Gold Standard



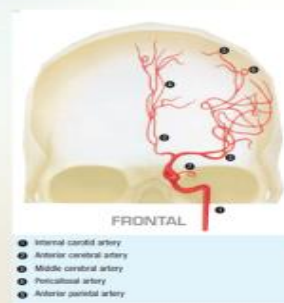
(AHRQ, n.d.)



(Marder et al, 2014)

Neuro Imaging

- CTA (Angiocalc, 2018)



- Internal carotid artery
- Anterior cerebral artery
- Middle cerebral artery
- Posterior artery
- Anterior posterior artery

Process of Timeline to Diagnosis

- Recognize BEFAST abnormal findings
- Contact stroke team
- Evaluate airway compromise
- Interpret EKG
- Obtain labs for sugar level, BMP, CBC, coag panel
- Insert IV (18 to 20 gauge preferred)
- Order head non contrast CT
- Deliver report to team (SBAR)
- Reduce hypertension if present
- Recognize neurological deterioration and continually re-assess

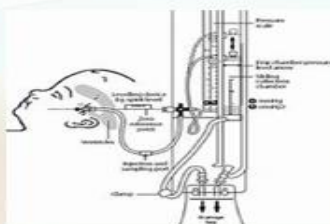
Endovascular Intervention

- **Coil Embolization** (Angiocalc, 2018)

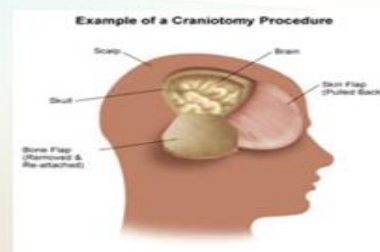


Surgical Options

- **EVD** (Gardner, 2009)



- **Craniotomy** (Hopkinsmedicine, n.d.)

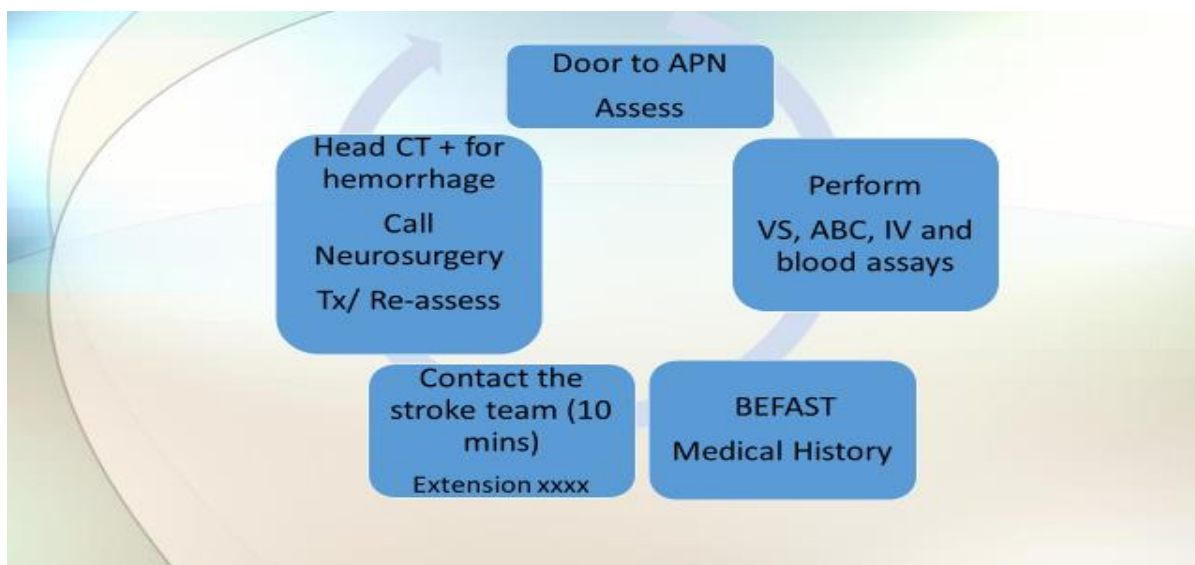


Case 1

- 40 year old female who presents to the gym on the treadmill and suffers a sudden, severe headache. She drives home and collapses in the bathroom. 911 is called by her family and she is taken via helicopter to a CSC.
- In the ED she is arousable to her name, lethargic, and only follows simple commands. She can not perform commands of the NIHSS exam.
- VS: 148/92, 88, 10, 97.8. Pulse ox 99%. Medical history is negative and she takes no medications.
- As the APN team stands by....what are next vital steps....

Case 2

- A 76 year old male is sleeping and snoring who is gently woken up by his spouse. He is not responding to his name and continues snoring. The spouse calls 911 and EMS arrives. He is taken to the nearest CSC hospital and you are the only APN on duty attending to this patient.
- What detailed history intake will you explore and what is the plan of care.



Summary

- Cerebral Hemorrhages are life threatening
- APNs play a vital role in early recognition
- **Increasing frontline APNs knowledge on early assessment and recognition is critical for improving clinical decision making**
- Key factors impacted with rapid diagnosis:
 - Avoids progression of hemorrhage
 - Minimizes disability
 - Lowers health care costs
 - Decreases hospital stays
 - Better patient outcomes (Clarke & Foster, 2015)

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Appendix B: Expert Panel Validation Form

Early Identification of Cerebral Hemorrhage

Please complete the form below and place your best answer by choosing the number describing how you rate the educational information provided. Please enter your expert opinion and comments below each question.

1. Does the education provided meet criteria for APNs to recognize early hemorrhagic stroke in the ED?

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

Comments:

2. Is the educational module addressing the gap in stroke knowledge with APNs in the ED?

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

Comments:

3. The material presented will prepare APNs in the field when initially assessing a hemorrhagic stroke patient.

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

Comments:

4. Does the education provide a clear and concise approach to easily understand the significance of properly assessing hemorrhagic stroke patients?

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

Comments:

5. Is the educational material in succinct with organizational protocol and order sets when a diagnosis of a cerebral hemorrhage is made?

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

Comments:

6. Is it obvious that the program will increase APN knowledge as supported by evidence based practice?

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

Comments:

Thank you for your time and feedback.