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THE EFFECTS OF ENHANCED DISCHARGE EDUCATION ON KNOWLEDGE  
RETENTION IN FIRST TIME STROKE/TIA PATIENTS

BY

EDWARD M. STINER, JR.

A THESIS PRESENTED TO THE GRADUATE FACULTY OF

THE COLLEGE OF NURSING

UNIVERSITY OF TEXAS AT BROWNSVILLE

IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE

MASTER OF SCIENCE IN NURSING

APPROVED BY:



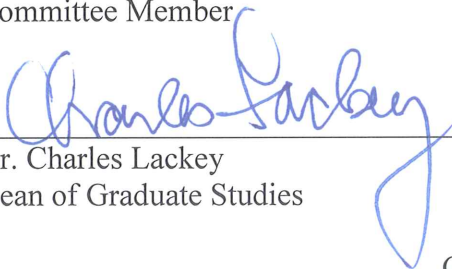
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NOVEMBER 2014

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## Abstract

The purpose of this study is to determine whether patients aged 40-65 years, who are admitted for stroke or a transient ischemic attack (TIA) for the first time and who receive enhanced stroke discharge education have higher levels of education retention than patients aged 40-65 years who are admitted for stroke/TIA for the first time who receive standard stroke discharge education without the enhancement. Forty male and female participants were randomly placed into either a standard discharge education  $N=20$  or enhanced discharge education group:  $N=20$ . The standard discharge education group received the usual stroke/TIA discharge education administered by the staff nurses on the stroke unit while the enhanced discharge education group received a one on one education session, with the principal investigator, in addition to the standard hospital discharge education provided by the staff. Participants were administered the Stroke Patient Education Retention (SPER) Questionnaire prior to the education, after the education (prior to discharge) and at 30 days after discharge. Utilizing an independent samples  $t$ -test it was determined that there was not a statistically significant difference between the two groups in relation to the pretest scores ( $p=.497$ ). However, a statistically significant difference did exist between the two groups on the posttest and 30-day follow-up with ( $p <.0005$ ) for both tests. Participants in the enhanced discharge education group had higher scores on their SPER questionnaire, which correlates to higher levels of knowledge retention.

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## CHAPTER I

### INTRODUCTION

Cerebrovascular accident, or stroke, is the third leading cause of death and the leading cause of disability in the United States. The two most common etiologies for stroke are *ischemic*, a loss of blood supply to an area in the brain from blockage by a blood clot or plaque and *hemorrhagic*, bleeding into an area of the brain from blood vessel rupture or leakage (National Stroke Association, 2014). Moreover, both types of stroke result in disability based on the area of the brain affected. According to the National Stroke Association (2014), 87% of strokes are ischemic in nature. Furthermore, modifiable and non-modifiable risk factors place individuals at higher risk of suffering a stroke. Modifiable risk factors include: previous stroke or transient ischemic attack (TIA), high cholesterol levels, high blood pressure, heart disease, atrial fibrillation, carotid artery disease, tobacco addiction, excess consumption of alcohol, and sedentary lifestyle. Non-modifiable risk factors for stroke include: being over 55, being a male, being of African-American, Pacific Islander, or Hispanic descent, having a history of diabetes, and having a family history of stroke (National Stroke Association, 2014). One fourth of strokes occur in people under 65 years of age (Westerby, 2011). People of middle age that survive a stroke may have longer to live with disability than their older counterparts. Furthermore, people in this age range may develop a feeling of stagnation if they are unable to contribute to the world (Myers, 2008).

According to the Texas Department of State Health Services (2013) in Texas the death rate for heart disease (22 deaths per 100,000 persons) and stroke (47 deaths per



100,000 persons) exceeds the national death rate averages (16.9 deaths per 100,000 persons for heart disease and 40 deaths per 100,000 persons for stroke). These statistics demonstrate that people in Texas are twice as likely to die from a stroke versus from heart disease. Surviving a stroke leads the risk factors for suffering another, possibly more serious or debilitating stroke (O'Connell & Hartigan, 2011). The National Stroke Association (2011) claims that 40% of people who suffer a TIA will go on to have an actual stroke. According to Bergman (2011) 45-65% of strokes occurring after a TIA transpire within 30 days. Furthermore, of the approximately 800,000 strokes occurring this year 160,000 (one in five) people will have a second stroke (secondary stroke) within five years. Additionally, secondary strokes often have a higher rate of death and disability because parts of the brain are already damaged by the original stroke and now may not be as resilient as they were previously (National Stroke Association, 2014). The magnitude of this health disparity along with the risk of suffering another stroke with more debilitating consequences indicates the urgent need to prevent recurrent stroke (O'Connell & Hartigan, 2011).

Stroke is a debilitating condition that requires further research to examine methods to decrease occurrence and recurrence. The purpose of this study is to determine whether patients aged 40-65 years, who are admitted for stroke/TIA for the first time and who receive enhanced stroke discharge education have higher levels of education retention than patients aged 40-65 years who are admitted for stroke/TIA for the first time who receive standard stroke discharge education without the enhancement. The research question for this study is: Do patients aged 40-65 years, who are admitted for initial stroke/TIA and who receive enhanced stroke discharge education have higher

Stroke Patient Education Retention (SPER) scores than patients aged 40-65 years who are admitted for initial stroke/TIA who receive standard stroke discharge education without the enhancement?

In their recent literature review Hafsteinsdottir, Vergunst, Lindeman, and Schuurmans (2011) found that in the acute phase of stroke 40% of patients and 67% of caregivers had unanswered questions related to the stroke. Few studies address stroke education and stroke patients' needs after discharge. Furthermore, because family members generally act as primary caregivers they frequently shoulder the patients' activities of daily living and new tasks related to their disability. Including the family in stroke education is imperative to improving patient outcomes (Cameron, 2013).

The Joint Commission (2014) states that discharge education must include the following factors: the importance of follow-up appointments, medications prescribed, personal risk factors, warning signs and symptoms of a repeat stroke, and activation of the emergency medical system. Nurses routinely educate patients and families about these factors via discussion, handouts, and brochures (Cameron, 2013). Despite education and public awareness campaigns those at highest risk for stroke consistently demonstrate poor understanding of stroke signs and symptoms. Furthermore, due to this lack of understanding, patients fail to seek early intervention with thrombolytic treatment (O'Connell & Hartigan, 2011).

Lennert (2009) found that stroke/TIA patients commonly struggle with their medication regimen adherence. The variety of reasons for non-adherence include: forgetting, cost, lack of understanding of the importance in relation to their overall health, or concern over side effects (Lennert, 2009). Ischemic strokes may result in learning



deficits associated with the area of the brain affected (Cameron, 2013). Non-adherence can lead to another stroke or even death (Lennert, 2009). Education should be tailored to the specific learning strengths of each individual patient (Cameron, 2013).

Designing tailored educational strategies to address some of these reasons, such as forgetting, provides an avenue to address non-adherence and its consequences.

Ebbinghaus's forgetting curve found individuals often forget initial information soon after it is learned. Factors such as the way in which the information is learned and how frequently the information is reviewed play important roles in the rate at which these memories are retained (Hu et al., 2013). Having a 90 day follow-up, may occur too long after the initial introduction to expect patients to be able to state warning signs of stroke, list personal modifiable risk factors, explain what to do if stroke symptoms develop, list medications prescribed to help prevent secondary stroke, and list the type of stroke they suffered.

According to Kind et al. (2008) about 20% of acute stroke patients experience at least one readmission within 30 days of discharge. Furthermore, these readmissions are typically preventable and signify potential health system failures. For example, Kind et al. (2008) found that patients are often readmitted for complications from stroke including seizures, aspiration, fall, and for recurrent stroke/TIA. Moreover, patients are also readmitted for conditions that could have been a cause of their stroke/TIA such as hypertensive emergency and atrial fibrillation (Nahab, Takesaka, & Helmers, 2012). Kind et al. (2008) concluded that patients experiencing readmissions within 30 days of discharge have poorer survival rates over those with no readmissions.

In summary, stroke remains a debilitating event especially for those under the age of 65. Recurrence of stroke and readmission for stroke after a TIA are common. Effective education encouraging early treatment for signs and symptoms of stroke, modifying personal risk factors, and understanding medication will produce more positive clinical outcomes.

### **Purpose of the Study**

The purpose of this study is to examine stroke education retention and determine if providing enhanced stroke discharge education and frequent follow-up is an effective method to increase knowledge retention in first time stroke/TIA patients.

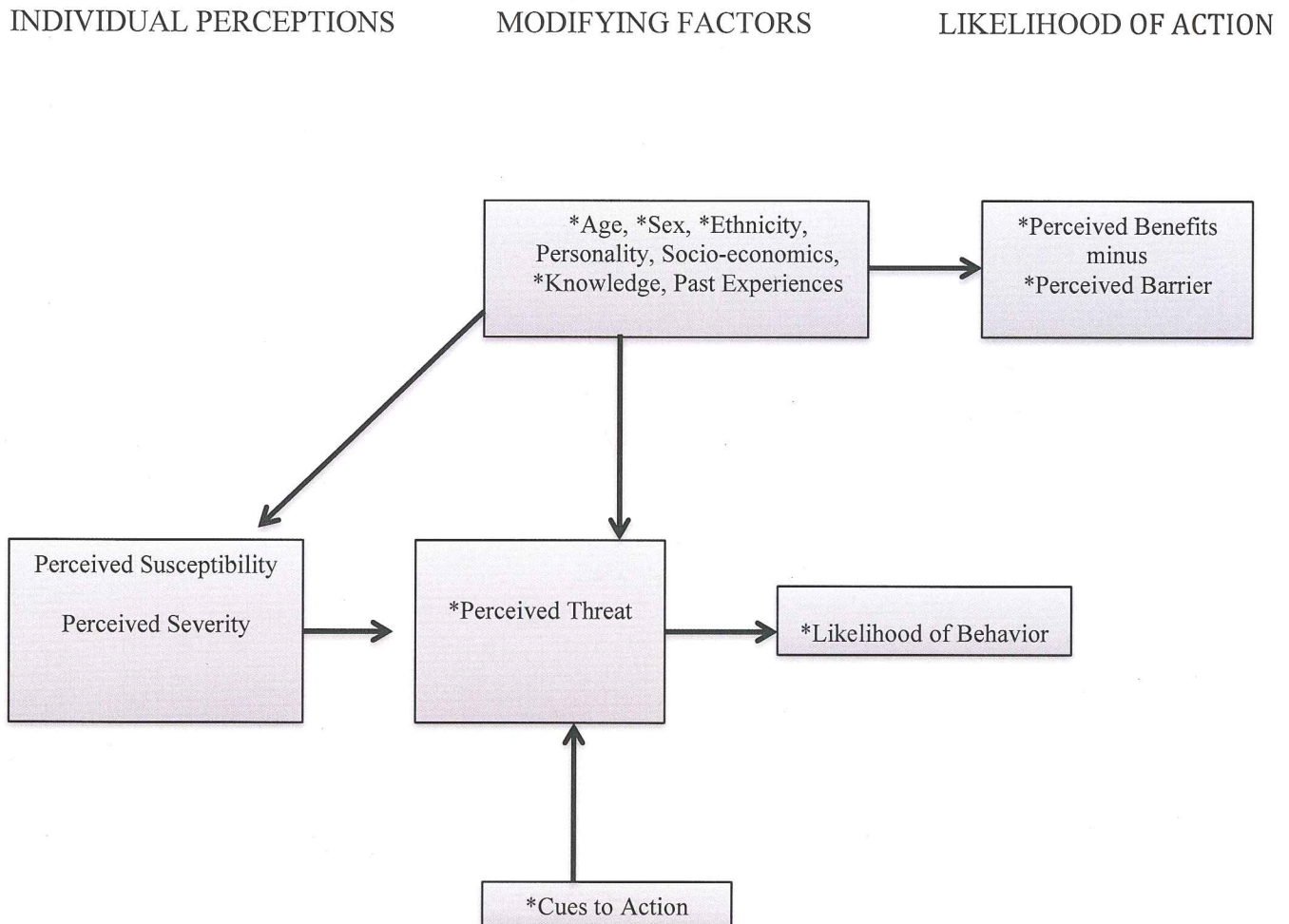
### **Hypothesis/Research Question**

The research hypothesis for this study is that patients, who receive enhanced stroke discharge education and frequent follow-up, will be more likely to retain stroke discharge education. The research question for this study is: Do patients aged 40-65 years, who are admitted for initial stroke/TIA and who receive enhanced stroke discharge education have higher SPER scores than patients aged 40-65 years who are admitted for initial stroke/TIA who receive standard stroke discharge education without the enhancement?

### **Conceptual Framework**

The conceptual framework utilized for this study was the Health Belief Model (HBM). The HBM is based on the understanding that a person will take a health-related action if that person feels that a negative health condition can be avoided, has a positive expectation that by taking a recommended action he/she will avoid a negative health

condition, and believes that he/she can successfully take a recommended health action (Becker, 1974). Figure 1 displays the major concepts of the HBM and their relationship to the desired outcome, taking action to improve health.



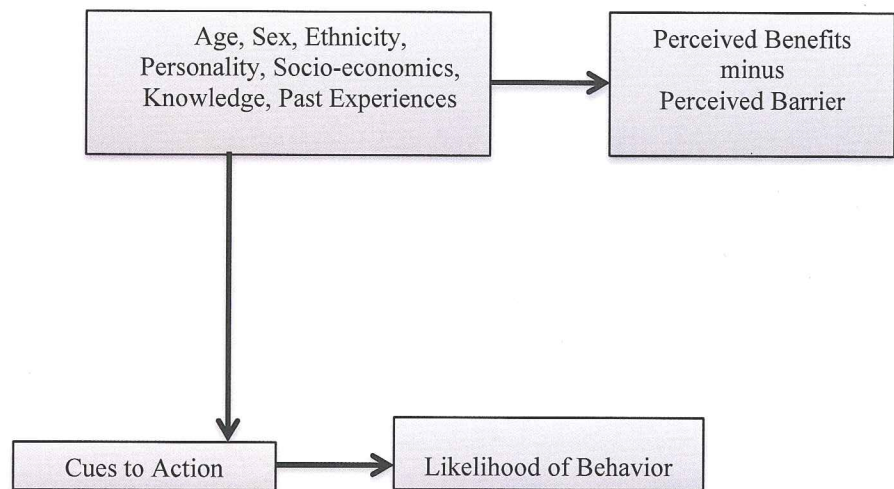
*Figure 1.* The Health Belief Model. Concepts with an asterisk are being measured in this study.

Figure 2 displays the HBM as it is adapted for this study. The concept shown in Figure 2 is to utilize cues to action such as patient education and frequent follow-up to increase participant's likelihood of action if they develop recurrent stroke/TIA symptoms in the future.

## INDIVIDUAL PERCEPTIONS

## MODIFYING FACTORS

## LIKELIHOOD OF ACTION



*Figure 2.* The Health Belief Model adapted for this study.

In a study of 126 men/women at risk for stroke, those who self-identified as overweight or obese demonstrated a change in behavior when taught the benefits of weight loss and exercise in preventing stroke (Sullivan, White, Young, & Scott, 2009). The HBM uses individual perceptions and modifying factors to explain the likelihood of taking action. Individual perceptions of the HBM focus on four concepts: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Sullivan et al., 2009). For instance, one person who has had a stroke may perceive they are more likely to have another stroke. Another person may believe that a second stroke is unlikely. Modifying factors such as age, sex, ethnicity, personality, socio-economics, and knowledge also play a part in behavior change. A patient that has hypertension and is knowledgeable about the increased risk for stroke may take action to control their blood pressure, while another person may not have the knowledge and is unlikely to take



appropriate action to control their blood pressure. The HBM has been used to understand the relationship between health beliefs and stroke (Sullivan et al., 2009). Sullivan's (2009) study aimed to determine the relationship between beliefs and intention to lower risk for stroke. By utilizing the Cerebrovascular Attitudes and Beliefs Scale (CABS-R) Sullivan determined that underlying beliefs are important in determining intention to reduce stroke risk (Sullivan et al., 2009).

**Individual perceptions.** Individual perceptions of the HBM include the concepts of perceived susceptibility and perceived severity (Becker, 1974). Approximately 800,000 strokes happen every year with approximately 160,000 (20%) being recurrent in nature. These numbers equate to one person having a stroke every 45 seconds with one person dying from stroke every 3.3 minutes. Furthermore, men are 1.25 times more likely than women to have a stroke however, women are more likely to die from stroke (25% in the first year) (National Stroke Association, 2014). If an individual knows these facts, the perceived susceptibility for stroke may increase. Recurrent strokes are more likely to be fatal than first strokes and survivors are more likely to be left with major disability (Slark, 2010). If an individual knows these facts, the perceived severity of a secondary stroke may increase.

**Modifying factors.** Modifying factors associated with the HBM include: age, sex, ethnicity, socioeconomic status, knowledge, past experiences, perceived threat, and cues to action (Becker, 1974). Stroke is a disease that does not discriminate based on age. Stroke risks do however increase with age with risk doubling for each decade after age 55 (National Stroke Association, 2014). As previously mentioned males are more likely than females to suffer a stroke and those of Hispanic origin are more likely than

their Non Hispanic White counterparts to suffer a stroke. Socioeconomic status plays an important role in access to medical care and adherence to secondary prevention (Slark, 2010). Patients who experienced stroke/TIA symptoms should be able to identify them; however, literature reveals that those at highest risk for stroke consistently demonstrate a lack of understanding of the signs and symptoms of stroke (O'Connell & Hartigan, 2011). Young stroke/TIA patients will need to modify and control risk factors longer than older patients with stroke/TIA. Young stroke patients face more years of living with disability (Slark, 2010).

**Cues to action.** Cues to action designed to decrease secondary strokes include: mass media campaigns, education, and frequent reminders. Joint Commission standards require staff to inform patients that they should activate the emergency medical system if they experience warning signs and symptoms of stroke. It has been shown that patient reinforcement and reminding are beneficial in increasing patient behavior changes and adherence in stroke patients (Slark, 2010).

**Perceived benefits.** In order to change a behavior patients must find the value or usefulness of a new behavior in decreasing the risk of developing a disease (Sullivan et al., 2009). For example, in stroke patients that smoke the patient who values tobacco cessation as a strategy to prevent stroke is more likely to change their behavior.

**Perceived barriers.** Perceived barriers are the person's own opinion of obstacles in the way of him/her adopting a new behavior (Becker, 1974). In stroke education it is important to examine barriers to changing modifiable variables that increase a patient's risk for stroke. Supposing a person lives in an area with poor street lighting or in an

unsafe neighborhood, this may be a barrier to decreasing sedentary lifestyle (Sullivan et al., 2009). Overcoming barriers facilitates changes in behavior.

**Likelihood of action.** Likelihood of action associated with the HBM includes: perceived benefits of preventive action minus perceived barriers to preventive actions and likelihood of behavioral change (Becker, 1974). Perceived benefit arises from the belief that a new behavior is better than current behavior. Perceived barriers occur when the patients believe a situation hinders adoption of the new behavior (Becker, 1974). Stroke patients who perceive that benefits of preventing a secondary stroke outweigh barriers related to necessary lifestyle changes, change is more likely.

In closing, this study explored the concepts of modifying factors and the likelihood of action from the HBM as depicted in Figure 1. Modifying factors such as: age, sex, ethnicity, socioeconomic status, knowledge, and past experiences are modifiable and non-modifiable factors that may increase or decrease the risk of suffering a stroke/TIA. The enhanced stroke discharge education is a component of the cues to action, which aim to increase patient behavior changes and adherence through education. Educating stroke/TIA patients about risk of secondary stroke/TIA is aimed at increasing the likelihood of action by changing perceptions about the perceived benefits of change compared to the perceived barriers of adopting change.

### **Assumptions**

1. The sample population included in the study was representative of the general hospital population of stroke/TIA patients in the region.
2. Participants in both groups were still provided with standard stroke/TIA education from hospital staff nurses.

## **Limitations**

The following limitations that may have influenced results were identified:

1. The nursing staff of the stroke unit may have spent more time than usual in educating patients because they were aware of the study being performed.
2. Due to language barriers only participants that spoke, read, and understood English were included in the study.
3. Because those participants in the enhanced group received more time with the principal investigator, that may have played a role in their better SPER scores. To counter for this problem the principal investigator could have spent an equal amount of time with those in the standard group reviewing the standard hospital discharge information given to them by the stroke unit nurses.
4. Participants being admitted to the stroke unit from other units such as the Intensive Care Unit (ICU) may have already received some stroke education hence possibly altering their pretest scores. To counter for this limitation future research could focus solely on those patients admitted directly to the stroke unit.

## **Definition of Terms**

**Ischemic stroke.** Occurs when arteries are blocked by blood clots or by the gradual build-up of plaque and other fatty deposits (National Stroke Association, 2014).

**Transient ischemic attack (TIA).** A “mini-stroke” caused by low blood flow in a major artery, a blood clot that breaks off and travels to the brain and blocks a blood vessel, or narrowing of a smaller blood vessel in the brain due to plaque build-up; that has the same presenting symptoms of a stroke but last less than 24 hours before disappearing and do not cause permanent damage (National Stroke Association, 2014).



**Patient education.** Interventions that facilitate learning for individual patients and caregivers, families, and groups, or communities (Hafsteinsdottir et al., 2011).

**Self-efficacy.** The confidence a person has in their ability to perform a task or specific behavior (Korpershoek, van der Bijl, & Hafsteinsdottir, 2011).

**Middle adulthood.** As per Erickson's Stages of Psychosocial Development is a person age 40-65 in the stage of generativity versus stagnation. In this stage of development people discover a sense of contributing to the world, usually through family and work, or they may feel a lack of purpose (Myers, 2008).

**Perceived susceptibility.** One's opinion of chances of getting a condition (Sullivan, et al., 2009).

**Perceived severity.** One's opinion of how serious a condition and its consequences are (Sullivan, et al., 2009).

**Perceived benefits.** One's belief in the usefulness of the advised action to reduce risk or the seriousness of impact (Stonecypher, 2009).

**Perceived barriers.** One's opinion of the tangible and psychological costs of the advised action (Stonecypher, 2009).

**Secondary stroke.** A stroke occurring after a person has already suffered a previous stroke (National Stroke Association, 2014).

**Health belief model (HBM).** A model based on the understanding that a person will take a health-related action if that person feels that a negative health condition can be avoided, has a positive expectation that by taking a recommended action he/she will avoid a negative health condition, and believes that he/she can successfully take a recommended health action (Becker, 1974).

**Stroke patient education retention (SPER) questionnaire.** A questionnaire that measures stroke patient education retention and responses.

## CHAPTER II

### LITERATURE REVIEW

#### Supporting Literature

Modifiable and non-modifiable risk factors place individuals at higher risk of suffering a stroke. Modifiable risk factors include: previous stroke or TIA, high cholesterol levels, high blood pressure, heart disease, atrial fibrillation, carotid artery disease, tobacco addiction, excess consumption of alcohol, and sedentary lifestyle (National Stroke Association, 2014). Non-modifiable risk factors for stroke include: being over 55, being a male, being African-American, Pacific Islander, or Hispanic, having diabetes, and having a family history of stroke (National Stroke Association, 2014). Hypertension is the most important modifiable risk factor for prevention of stroke and repeat stroke (MacKenzie et al., 2013). In a meta-analysis of 61 studies and more than a million participants over 12 years of follow-up, MacKenzie et al. (2013) demonstrated that every 2 mmHg decrease in systolic blood pressure was associated with a 10% reduction in mortality from stroke.

According to Bloie (2011) 15% of all ischemic strokes due to embolism can be attributed to atrial fibrillation. In atrial fibrillation the heart beats irregularly and, usually, faster than normal. Furthermore, atrial fibrillation is the most common cardiac arrhythmia and many patients are asymptomatic until a stroke occurs (Bloie, 2011). According to the National Stroke Association (2014) atrial fibrillation may cause a clot to form subsequently traveling to the brain causing a stroke or TIA. Furthermore, this condition increases a person's risk for stroke by 500%. If diagnosed, atrial fibrillation

risk for stroke decreases significantly (National Stroke Association, 2014). Managing vascular risk factors such as atrial fibrillation and hypertension reduces stroke recurrence by 70-80% (Joubert et al., 2009).

The National Stroke Association (2014) recommends treating and managing all lifestyle stroke risk factors to decrease a person's chance of having a stroke or TIA. For non-modifiable risk factors such as diabetes, it is important to control blood glucose levels, have a nutritious diet, and exercise to decrease stroke and TIA risks. Educating patients about personal risk factors after a stroke offers a strategy widely acknowledged to support a comprehensive plan to decrease morbidity, mortality, and recurrent stroke (National Stroke Association, 2014).

Bergman's (2011) literature review revealed that close to 25% of the approximately 800,000 strokes that occur annually are recurrent in nature. Additionally, 30-40% of patients are likely to suffer recurrent stroke within five years of the initial stroke. Bergman (2011) also reported that stroke is higher in patients who have suffered a TIA. Furthermore, studies in Bergman's (2011) literature review reveal that 3-6% of patients will experience a stroke within two days of a TIA, and about 45-65% of strokes will occur in the first 30 days after a TIA if not treated appropriately.

Chuang, Wu, Ma, Chen, and Wu, (2005) and Kind et al. (2008) report factors and costs associated with readmission among stroke patients. Chuang's study group (2005) used a longitudinal study design to determine that 24.3% of stroke patients were readmitted to the hospital within one month of discharge in Taipei. Reasons for readmission focused on the underutilization of institutions post discharge (Chuang et al., 2005). The study found that compared to patients with other chronic conditions, stroke

patients had longer length of stay, more readmissions, and higher medical costs (Chuang et al., 2005). Kind et al. (2008) utilized a retrospective analysis of administrative data to determine that patients that were readmitted within 30 days after a stroke had poorer survival rates and higher healthcare costs than those with no readmission. Furthermore, patients with multiple readmissions may signify potential health system failures and represent a target for improving quality care. The authors found that 20% of acute stroke patients experience at least one readmission and 16% of those experiencing two or more readmissions within 30 days of hospital discharge. Moreover, the study found that while some readmissions were preventable some are a reflection of complex, difficult to measure factors such as social support, healthcare access, and cultural factors (Kind et al., 2008).

O'Connell and Hartigan (2011), using a secondary data analysis, found that the majority of stroke survivors could not identify stroke warning signs. Seven of the ten participants in the study failed to recognize the association between their symptoms and stroke. Failure to recognize signs and symptoms of stroke and act early prevents adequate therapy, because patients will be ineligible for thrombolytic therapy. O'Connell and Hartigan (2011) also showed that despite public awareness campaigns those at highest risk for stroke consistently demonstrated the poorest level of knowledge. The use of the acronym FAST (face, arm, speech, and time) highlights focal signs of stroke and reiterates the importance of contacting emergency medical services for transport to a primary stroke center for immediate treatment. Joint Commission and the American Stroke Association's *Get with the Guidelines* campaign both support using the acronym.



A cross-sectional descriptive study showed that despite having a previous stroke or TIA little was known about the warning signs and risk factors of stroke (Zeng et al., 2012). Fewer than 4% of the 1200 respondents in the study by Zeng et al. (2012) were able to identify all the signs and symptoms of stroke. Moreover, fewer than 10% of the respondents understood that stroke was an emergency requiring immediate attention.

Eissa, Krass, and Bajorek (2012) report that strokes occur every 40 seconds in the United States with only 2% of ischemic stroke patients receiving thrombolytic therapy with recombinant tissue plasminogen activator (rt-PA). Furthermore, evidence supports the premise that patients treated with rt-PA are at least 30% more likely to have minimal or no disability at three months. Additionally, the study found that the most common reasons for treatment delay were the ability to recognize stroke signs and symptoms and failure to react appropriately. Despite public awareness campaigns, knowledge of stroke has not noticeably improved (Eissa et al., 2012).

A study by Almborg, Ulander, Thulin, and Berg (2009) utilized a prospective cross-sectional study to describe relatives' perceived participation in the discharge planning for stroke patients. They found that 46-53% of the 152 participants perceived that they did not receive any information about post hospitalization care, medications, rehabilitation, or support. Additionally, 80% perceived no participation at all in setting the goals and needs of the patient (Almborg et al., 2009). Based on this study it is evident that nurses should give more attention to educating family members when planning for discharge. Because stroke leaves patients with limitations, including family in the discharge planning process provides necessary support for the patient.

Another study by Almborg et al. (2008) used a cross-sectional design to explore stroke patients' perceptions of their participation in the discharge process. The authors reported that most patients recalled receiving information about stroke but 15-47% of the 188 participants did not recall participation in the planning of medical treatment or goal setting. It was found that participation in discharge planning enhanced patient quality of life, self-esteem, personal responsibility for their health and own care, and their satisfaction with outcomes (Almborg et al., 2008). Including patients in their discharge process helps improve self-efficacy and provides for patient-centered care and improved patient outcomes.

Cameron (2013) reports a lack of research addressing stroke education needs of patients following stroke in a review article about stroke research. Furthermore, the study focuses on caring for a chronic disease and takes into consideration the special needs of the stroke population including: disease prevention, disease specific education, and self-management. Cameron (2013) also discussed the importance of educating the family as well due to possible role changes experienced after a stroke. In their systematic review of the literature Hafsteinsdottir, Vergunst, Lindeman, and Schuurmans (2011) reveals that a lack of education for patients and caregivers can lead to misconceptions, anxiety, fear, poor health status, and emotional problems like depression. The systematic review also found that many stroke patients and their families express a lack of understanding about the causes and the consequences of stroke, about secondary preventive measures, and about the availability of support agencies and support groups (Hafsteinsdottir et al., 2011). This review also presents multiple unmet needs of young

stroke survivors in the chronic phase such as stroke prevention, treatment, recovery, and returning to work.

Stroke education should include: the importance of follow-up appointments, medications prescribed, personal risk factors, warning signs and symptoms of a repeat stroke, and activation of the emergency medical system (Joint Commission, 2014). Nickles et al. (2013) collected data on acute stroke admissions ( $N=9609$ ) and found that only 68.9% of patients were educated about stroke warning signs and 66.8% were educated about emergency medical service activation. Furthermore, it was noted that stroke education was delivered less often to patients admitted with TIA. Only 60% of patients received stroke education consistent with Joint Commission standards (Nickles et al., 2013).

Studies from (Korpershoek et al., 2011; Hackett, Yapa, Parag, & Anderson, 2005) discuss the concept of self-efficacy in stroke patients. Self-efficacy is the confidence in one's ability to perform a task or specific behavior (Korpershoek et al., 2011). It is concluded that patients with high self-efficacy function better in daily activities than patients with low self-efficacy (Korpershoek et al., 2011). Stroke has an immense impact on the physical, psychological, and social functioning of patients. Most people who suffer a stroke face some form of limitation in functioning (Hackett et al., 2005). Nurses help improve patient self-efficacy by offering encouragement during daily care and by communicating and educating patients about physiological factors such as the signs and symptoms of stroke and limitations that may occur due to their specific type of stroke (Korpershoek et al., 2011).

### **Hypothesis/Research Question**



The research hypothesis for this study is that patients, who receive enhanced stroke discharge education and frequent follow-up, will be more likely to retain stroke discharge education. The research question for this study is: Do patients aged 40-65 years, who are admitted for initial stroke/TIA and who receive enhanced stroke discharge education have higher SPER scores than patients aged 40-65 years who are admitted for initial stroke/TIA who receive standard stroke discharge education without the enhancement?

### **Importance of the Study/Nursing Implications**

A stroke is a medical emergency that requires immediate medical attention. However, research shows that only approximately 2% of stroke patients that qualify for thrombolytic therapy receive the treatment (Alspach, 2013). The literature demonstrates that stroke is a debilitating condition that can lead to other health problems and poor quality of life for survivors. Patients that suffer a second stroke and survive are more likely to have poorer outcomes than their counterparts. In addition, transient ischemic attacks are precursors for a stroke and a great number of patients that suffer from a TIA will go on to have a stroke. Nurses play an integral role in educating patients, family members, caregivers, and the community about the signs and symptoms of stroke/TIA and the need to seek immediate medical attention. Educating patients based on Joint Commission guidelines prior to discharge can improve patient outcomes and help to prevent readmissions and recurrent strokes. Surveying patients prior to discharge and frequent follow-up gives nurses the chance to find missed opportunities and ensure that patients, family members, and caregivers are knowledgeable about stroke/TIA.

## **CHAPTER III**

### **METHODOLOGY**

#### **Design**

The design of the study was a quantitative quasi-experimental pretest and posttest with two comparison treatments. One group received the standard stroke discharge education and the other received the enhanced stroke discharge education.

#### **Setting**

The sample for this study was selected from a 214-bed for profit acute care hospital located in deep south Texas designated by the Joint Commission as a certified Primary Stroke Center. The stroke unit utilized for this study attempts to involve the family in the education process.

#### **Sample**

Based on a performed power analysis, using a sample size calculator from DSS Research, a sample size of 40 male/female participants of middle age who met the study criteria was selected. Of the selected participants, 20 received standard stroke discharge education and 20 will received enhanced stroke discharge education. Participants were included if they were: 40-65 years old, diagnosed with ischemic stroke or TIA, discharged to home, and able to speak, write, and understand English. Individuals, who had a previous ischemic stroke, were being discharged to an agency rather than home, did not speak or understand English, and/or suffered from cognitive impairment that inhibits learning or comprehension were excluded.

The investigator approached 51 potential participants. Seven refused and four were excluded based on the established criteria. The study consisted of 40 total participants ( $N = 40$ ). Twenty participants were included each of the two groups, enhanced and standard. The study consisted of 18 males and 22 females. The enhanced group consisted of 10 males and 10 females, while the standard group consisted of eight males and 12 females. Of the 40 participants 24 had suffered a TIA and 16 had suffered a stroke. The enhanced group was comprised of 13 TIA participants and seven stroke participants. The standard group was comprised of 11 TIA participants and nine stroke participants. Three of the participants, that did not complete the study, were in the standard group. Two were female ages 52 and 61 respectively and one was a 58 year-old male. One 62 year-old female participant from the enhanced group did not complete the study. A total of 37 participants identified themselves as Hispanic, while three participants identified themselves as White. The mean age of the participants in the enhanced group was  $M = 51.10$  ( $SD = 7.79$ ), while the mean age of the standard group was  $M = 51.50$  ( $SD = 7.79$ ).

### **Institutional Review Board**

The investigator approached eligible participants to offer the opportunity for participation in the study. Participants were randomized into either the enhanced stroke discharge education group or the standard stroke discharge education group. Initial approach and consent of the participants took place with the investigator acting as a Master of Science in Nursing student of the University of Texas at Brownsville and not an employee of the participating hospital. Participants were asked to participate in a confidential study of stroke education in middle-aged patients planning discharge to

home. Participants were asked to sign the consent. Setting of the discharge education took place in the patient's room. Possible risks of participation include psychological issues, fatigue, pain, and cognitive issues. A possible benefit of the study is an increased knowledge about stroke/TIA, which has been shown to improve patient response to stroke/TIA and improve patient outcomes. Human subjects' approval from both the participating hospital and the University of Texas at Brownsville's Institutional Review Board was granted.

### **Instruments**

Data was collected using the Demographic Data Collection Tool and the SPER Instrument. Demographic data collected included: participant's name, date of birth, gender, ethnicity, number of family members, primary caregiver, date of admission, date of stroke/TIA, discharge date, and functional ability will be obtained from the medical record.

The SPER measures stroke patient education retention and responses. Participants were scored (range 0-10) using the SPER score. Questions 1 and 2 are scored as follows: 0 = no correct content in response to the question, 1 = the patient provided some but not all of the correct content in response to the question, and 2 = patient provided all key content in response to the question. Questions 3-5 are scored as follows: 0 = no correct content in response to the question and 2 = the patient provided the correct response to the question. A score of 10 indicates all correct responses to key content in the education process. The higher the patient scores on the SPER the better retention of the discharge education.



## **Procedure**

The investigator made daily rounds to invite patients hospitalized for the diagnosis of stroke/TIA to participate. The study was explained to interested individuals and if they chose to participate, the consent process was initiated and the consent to participate in the study was explained. Written consent was obtained prior to collection of any data.

Data collected included demographic information, answers to the SPER survey, standard hospital survey, and responses from follow-up phone calls. Demographic data was collected on all 40 participants. All participants received standard stroke discharge education. Standard stroke discharge education begins at admission and includes handouts and verbal education on all of the Joint Commission standards which includes: the importance of follow-up appointments, medications prescribed, personal risk factors, warning signs and symptoms of a repeat stroke, and activation of the emergency medical system.

Twenty participants received enhanced stroke discharge education in addition to the standard stroke discharge education. The enhanced stroke discharge education attempted to include family in the enhanced stroke discharge education process. The enhanced stroke discharge education included a session with the investigator, the patient, and the family/significant other whenever possible. The objectives of the enhanced stroke discharge education included: Table 1 displays a detailed description of the content, teaching strategies, time frame, and evaluation methods.

Table 1  
*Enhanced Stroke Discharge Education Content Outline*

Content Area	Education to be given
1. Personal Risk Factors	Individualized handouts on all of the patient's personal risk factors as well as education on how to prevent complications from them will be given. Education will also be given on how the risk factors increase risk for stroke emphasizing the importance of managing risk factors. (15-20 minutes)
2. Warning signs for stroke	Patients will receive the Reminder Magnet about the signs and symptoms of stroke. Verbal discussion of the signs and symptoms will be given in addition to the standard handouts provided by the hospital. Patients will then be asked to provide a teach back of the signs and symptoms so that remediation can be given if needed. (5-10 minutes)
3. Activation of emergency medical services (EMS)	Patients will receive the Reminder Magnet that discusses calling EMS if symptoms are noticed. Patients will be given verbal and written education on the importance of calling EMS immediately at the onset of symptoms to receive possible treatment. (5 minutes)
4. Need for follow-up after discharge	Verbal and written education will be administered stressing the importance of follow-up after discharge. If the patient is on an anticoagulant such as Coumadin the importance of routine blood work will be stressed. Patients are routinely given appointments prior to discharge from the hospital so that practice will continue. (5 minutes)
5. Medications prescribed for stroke	Verbal and written education will be administered informing the patients of the medications prescribed to prevent stroke reoccurrence. Patients will be given the opportunity to ask questions about their medication regimen and the importance of medication compliance will be stressed. Patients will then be asked to verbally tell the investigator which medications are being taken for stroke prevention.

Participants in the enhanced stroke discharge education group received the Reminder Magnet during their enhanced stroke discharge education (See Figure 2).



*Figure 3.* Reminder Magnet

Participants completed the SPER on their initial visit prior to the education session and then prior to discharge. The investigator assured that participants received the standard stroke discharge education packet that addresses the mandated Joint Commission topics: the importance of follow-up appointments, medications prescribed, personal risk factors, warning signs and symptoms of a repeat stroke, and activation of the emergency medical system. Stroke signs and symptoms as well as the personal risk factors the patient has for stroke were reviewed. Individualized educational handouts from standard education services and electronic standard medication education were given to the patient about the modifiable risk factors that they have and ways to prevent complications. Patients received personalized education about their medications used to prevent stroke such as their antiplatelet or anticoagulation medication. Patients were educated on the importance of compliance with medications and follow-up appointments with their

physician. Patients and family/significant others were given an opportunity to ask questions about their condition and received feedback from the investigator. Follow-up phone calls for the enhanced stroke discharge education group took place at three days, 14 days, and 30 days and tested the patient's retention of the education taught. The standard stroke discharge education group received follow-up phone calls at the same three days, 14 days, and 30 days time interval but were only asked the questions on the standard hospital discharge questionnaire until the 30 day follow-up when the participants were asked the questions from the SPER questionnaire.

Patient/family/significant other assessment occurred before and after the enhanced stroke discharge education. The SPER is a five-item survey administered to each participant. A Reminder Magnet was provided to patients and families prior to discharge. The remaining reminder strategies were the follow-up phone calls that occurred at three days, 14 days, and 30 days. The follow-up phone calls used a specific script to assure that each call conveys the same information. The SPER was administered again during each of these phone calls.

For this study the consequences of suffering a secondary stroke were discussed as well as the self-efficacy of stroke survivors to help decrease barriers to adopting preventive action. Enhanced stroke discharge education included repeated reassessment and reinforcement follow-up calls lasting 10-20 minutes utilizing the SPER at three days, 14 days, and 30 days post discharge. The investigator conducted the enhanced stroke discharge education while the staff of the Stroke Unit conducted the standard stroke discharge education. Figure 4 shows an outline of the interactions the principal investigator had with participants.



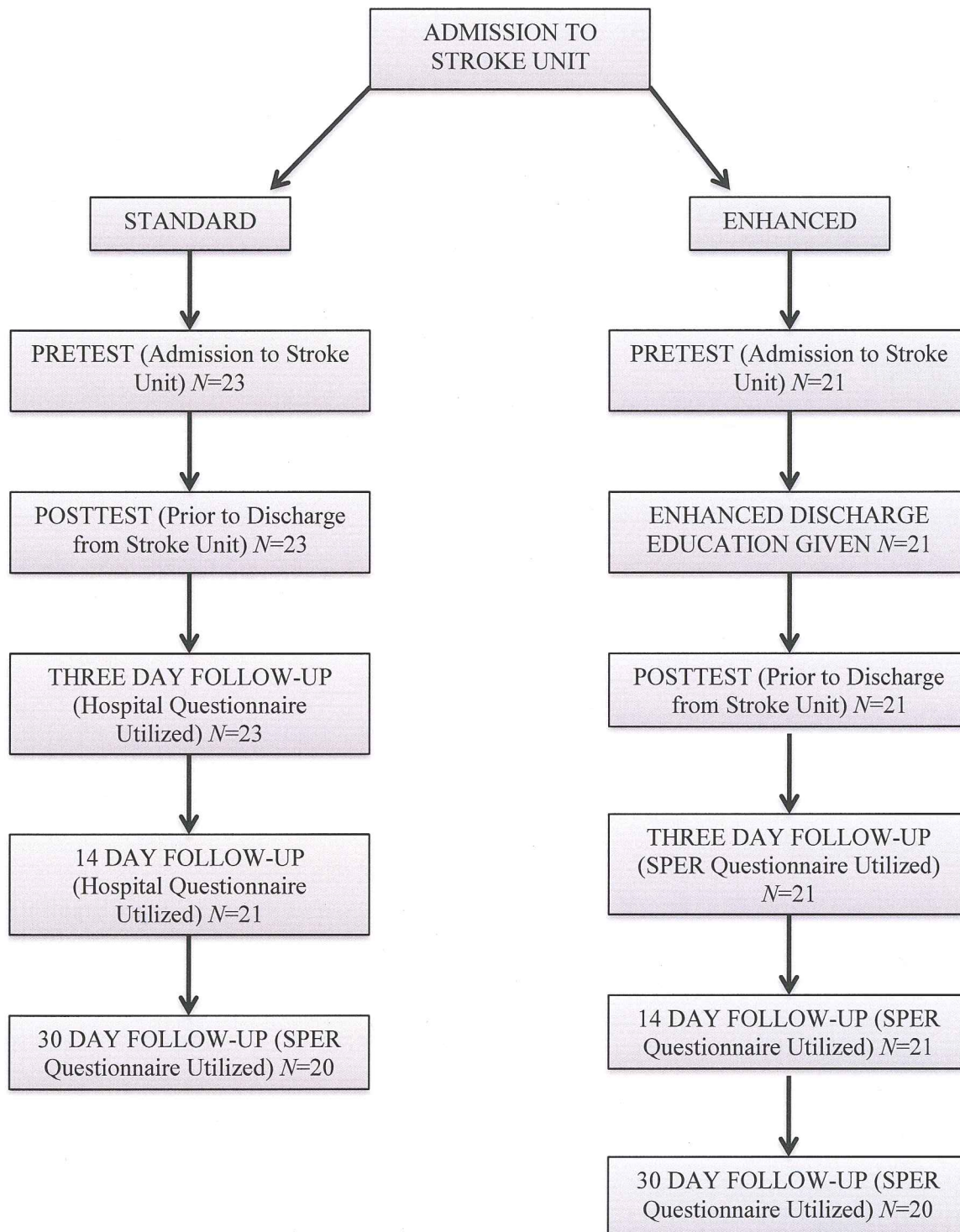


Figure 4. Outline of Interactions with Participants

**Data Management**

Data from each of the instruments was entered onto an Excel sheet and double-checked for accuracy of data input. Data collected is stored on a password-protected personal computer and backed-up to a password protected external hard drive. Research records will be stored securely in a locked file cabinet for three years after completion of the study and only approved researchers will have access to the records and data with personal identifiers.

## CHAPTER IV

### RESULTS

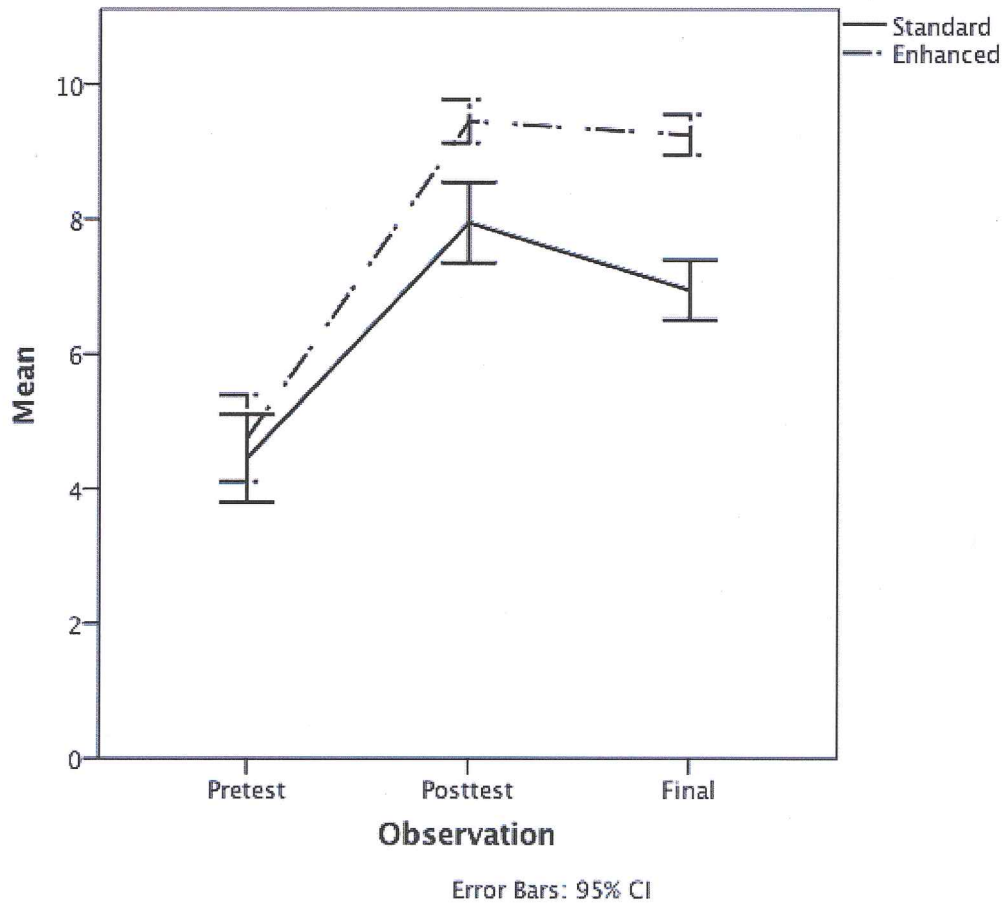
Table 2 shows the mean scores with standard deviation for the standard and enhanced group over the three observations.

Table 2

*Mean Scores with SD for Both Groups Over Each Observation*

Group	Pretest	Posttest	Final
Standard	$M=4.45$ ( $SD = 1.40$ )	$M=7.95$ ( $SD = 1.28$ )	$M=6.95$ ( $SD = 0.95$ )
Enhanced	$M=4.75$ ( $SD = 1.37$ )	$M=9.45$ ( $SD = 0.69$ )	$M=9.25$ ( $SD = 0.64$ )

Figure 5 shows the mean scores for both the standard and enhanced groups over the three observations with 95% CI.



*Figure 5. Mean SPER Scores With 95% CI over each observation*

Independent samples *t*-tests were performed to determine if a statistically significant difference between mean scores existed for each observation in both groups. A significance level  $p .05$  was utilized for all tests. Levine's *F* test was utilized to confirm homogeneity of variances. Furthermore, Cohen's *d* was utilized to determine effect size for each observation with .2 being a low effect, .5 being a medium effect, and .8 being a large effect based on Cohen's (1992) guidelines. A paired-samples *t*-test was performed to test the hypothesis that the final test and posttest means were equal.

### **Pretest**

Levine's *F* test:  $F(38)=.001, p=.970$ . Independent samples *t*-test:  $t(38)=.686, p=.497, d=.22$ . Thus the two groups were associated with statistically similar pretest scores with a small effect.

### **Posttest**

Levine's *F* test:  $F(38)=7.457, p=.010$ . Due to the results of Levine's *F* test equal variances was not assumed. Independent samples *t*-test:  $t(29.1)=4.629, p<.0005, d=1.46$ . Thus the enhanced group was associated with statistically significantly higher SPER posttest scores with a large effect.

### **Final Test**

Levine's *F* test:  $F(38)=.72, p=.401$ . Independent samples *t*-test:  $t(38)=9.02, p<.0005, d=2.85$ . Thus the enhanced group was associated with statistically significantly higher SPER final test scores with a large effect size.

### **Change in SPER Scores Over Time**

The standard education group demonstrated a significant decline in education retention between the posttest and the 30 day follow-up,  $t(19)=-4.156, p=.001, d=-.89$ .

The enhanced education group showed no significant decline in education retention between the posttest and the 30 day follow-up,  $t(19)=-1.00, p=.330, d=-.30$ .

### **Summary**

It was assumed that the sample population was representative of the general hospital population of stroke/TIA patients in the region. Data obtained from participants that did not complete the study was excluded from the statistical analysis associated with the study. All four participants that did not complete the study were not available for all of the follow-up phone calls and questionnaires as shown in Figure 4. Based on the above statistical analysis, it is evident that participants in the enhanced stroke discharge education group had statistically significantly higher scores on the SPER questionnaire than those in the standard stroke discharge education group at the posttest stage and at the 30-day follow-up. These results demonstrate that providing enhanced stroke discharge education and performing frequent follow-up with patients enhances their stroke knowledge and retention of the information taught (cues to action in HBM).



## CHAPTER V

### CONCLUSION

The purpose of this study was to determine if providing enhanced stroke discharge education and frequent follow-up would increase patient retention of the education they were taught. The following research question was addressed and conclusions were drawn based on the findings of the current study: Do patients aged 40-65 years, who are admitted for initial stroke/TIA and who receive enhanced stroke discharge education have higher SPER scores than patients aged 40-65 years who are admitted for initial stroke/TIA who receive standard stroke discharge education without the enhancement?

**Research hypothesis 1. Participants, who receive enhanced stroke discharge education and frequent follow-up, will be more likely to retain stroke discharge education.**

Yes, participants who received the enhanced stroke discharge education and frequent follow-up were more likely to have better SPER scores and therefore better retention of the discharge education.

**Research hypothesis 2. Participants, who receive stroke education, standard or enhanced, will have higher posttest score and higher 30-day follow-up scores.**

Yes, both methods of educating participants resulted in increased SPER scores. Those in the enhanced group performed even higher than those in the standard group.

**Implications of the Study**

The study demonstrates that providing enhanced stroke discharge education can increase retention of discharge content. This is significant because suffering a stroke/TIA is the number one risk factor of suffering a second stroke. Secondary stroke prevention is extremely important because patients that suffer a second stroke and survive are more likely to have poorer outcomes than their counterparts. Ensuring that patients comprehend and retain the education taught to them may improve patient outcomes and help to prevent readmissions and recurrent strokes.

### **Suggestions for Future Research**

Future research should be done in order to determine if providing enhanced stroke discharge education and frequent follow-up can help: 1) prevent hospital readmissions 2) increase compliance with medications 3) increase stroke/TIA survivors self-efficacy 4) increase the number of recurrent stroke/TIA patients that receive thrombolytic therapy 5) increase the likelihood of action by a patient experiencing a stroke/TIA 6) reduce risk factors for recurrent stroke/TIA. Educating patients based on Joint Commission standards and ensuring that patients are able to retain that knowledge can have health implications that should be explored further such as: increased use of thrombolytic therapy, earlier recognition of stroke signs and symptoms, and increased use of emergency medical services for transportation to a certified stroke hospital.

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## **APPENDICES**

**Appendix A.** SPER Questionnaire

**Appendix B.** Follow-up Phone Call Script

**Appendix C.** Informed Consent

**Appendix D.** IRB Approval Letter

**Appendix E.** Hospital Stroke Discharge Follow-up Questionnaire

## Appendix A. SPER QUESTIONNAIRE

Question	Acceptable Responses
1. Do you know the warning signs for stroke?	<ul style="list-style-type: none"><li>-Sudden weakness/numbness on one side of the body</li><li>-Confusion/trouble speaking (slurred speech)</li><li>-Trouble seeing</li><li>-Facial droop</li><li>-Sudden unexplained severe headache</li></ul>
2. What are your personal risk factors for stroke that can be modified to lower your risk of another stroke?	<ul style="list-style-type: none"><li>-Hypertension</li><li>-Diabetes mellitus</li><li>-High cholesterol</li><li>-Tobacco use</li><li>-Carotid artery disease</li><li>-Atrial fibrillation</li><li>-Sedentary lifestyle</li><li>-Excessive alcohol consumption</li></ul>
3. What will you do if you develop symptoms of a stroke?	<ul style="list-style-type: none"><li>-Seek emergency services by calling EMS or 911</li></ul>
4. Do you know the medication you were prescribed to prevent another stroke?	<ul style="list-style-type: none"><li>-Name of antiplatelet drug or anticoagulation drug</li></ul>
5. What type of stroke did you have?	<ul style="list-style-type: none"><li>-Ischemic stroke</li><li>-Brain infarction</li><li>-Stroke due to an occluded blood vessel</li></ul>

Subject responses are scored (range 0-10) using the SPER score. Questions 1 and 2 are scored as follows: 0 = no correct content in response to the question, 1 = the patient provided some but not all of the correct content in response to the question, and 2 = patient provided all key content in response to the question. Questions 3-5 are scored as follows: 0 = no correct content in response to the question and 2 = the patient provided the correct response to the question. A score of 10 indicates all correct responses to key content in the education session.

## **Appendix B. Follow-up Phone Call Script**

Good (Time of Day) Mr/Mrs/Ms \_\_\_\_\_ this is Edward Stiner, the graduate student from UTB calling for your (3, 14, 30) day follow-up. How are you doing today? I am calling to administer the Stroke Patient Education Retention questionnaire again. Is this a good time for you? (If the patient agrees the questionnaire will be administered at this time. If not I will seek a more convenient time to call back).

\*If the patient has questions about medications, symptoms, or any other issues they will be instructed to speak with their health care provider.

\*If the patient wishes to withdraw from the study at any time their request will be granted.

\*Follow-up phone calls should take approximately 10-15 minutes.

## **Appendix C. Informed Consent**

### **University of Texas at Brownville Institutional Review Board Informed Consent to participate in a Research Study**

**Project Title:** The Effects of Enhanced Discharge Education on Knowledge Retention in First Time Stroke/TIA Patients

**Principal Investigator:** Edward Stiner

**Department:** College of Nursing

You are being asked to volunteer for this research study. This study is being conducted at Valley Regional Medical Center. You were selected to participate in this study because of your diagnosis of stroke or transient ischemic attack (TIA).

Please read this form or ask any questions that you may have before agreeing to take part in this study. If you would prefer and/or are unable to read the form the principal investigator will read the form for you.

#### **Purpose of the Research Study**

The purpose of this study is to determine if enhanced discharge education improves patient knowledge retention about stroke or TIA better than the standard discharge education. Participants will be randomly placed into either the enhanced discharge education group or the standard discharge education group.

#### **Number of Participants**

42 males and females, ages 40-65, will participate in this study

#### **Procedures**

If you agree to be in this study, you will be randomly placed into either the enhanced discharge education group or the standard discharge education group. You will then be asked to complete the Stroke Patient Education Retention questionnaire. If you are in the standard discharge education group you will be given the routine discharge education that all patients with stroke or TIA are given by the nursing staff and then asked to complete the same questionnaire prior to your discharge home. If you are in the enhanced discharge education group, you will receive the standard discharge education that all patients receive however; prior to your discharge the principal investigator will meet with you and administer enhanced discharge education. Prior to discharge you will also be asked to complete the same questionnaire again. Both groups will receive follow-up phone calls 3 days, 14 days, and 30 days after discharge in which either the questions contained in the standard hospital discharge questionnaire or the Stroke Patient Education



Retention questionnaire will be asked. Results from the questionnaires will be analyzed to determine participant's level of retention of their discharge education and if a relationship exists between those that receive the standard discharge education versus the enhanced discharge education.

### **Length of Participation**

The questionnaire will take approximately 10 minutes to complete each time. You will be required to complete the questionnaire all 5 times to be included in the study. The enhanced discharge education will take approximately 1 hour to complete prior to your discharge from the hospital.

### **Risks of the Study**

Risks of the study may include: psychological issues, fatigue, pain, and cognitive issues.

### **Benefits of the Study**

You may benefit from increased knowledge about stroke or TIA, which has been shown to improve patient response to stroke or TIA and improve patient outcomes.

### **Confidentiality**

Your confidentiality is a top priority in this study. Participant's responses to the questionnaires will be tracked by an identification number given to you at the beginning of the study. Only the principle investigator will know your identification number. All questionnaires will be confidential and no identifying information such as name or date of birth will be utilized in the report. Research records will be stored securely in a locked cabinet for 3 years after completion of the study and only approved researchers will have access to the records.

### **Costs**

There is no cost for participation in the study.

### **Compensation**

You will not be paid to participate in this study.

### **Rights**

Your participation in this study is completely voluntary and you have the right to withdraw at any time without penalty.

### **Contacts and Questions**

If you have any concerns or complaints about the research you may contact the principal investigator at (956) 545-4980 or [edward.stiner38@utb.edu](mailto:edward.stiner38@utb.edu). For any questions or concerns about participant's rights you may contact the UTB Office of Research Integrity and Compliance at (956) 882-7731.

### **Statement of Consent**

You are voluntarily making the decision to participate in the above research study. Your signature below indicates that you understand the information provided and have had the opportunity to ask questions. Again, you may withdraw from the study at any time without penalty. You will receive a copy of the informed consent for your records.

---

Signature

Date

## Appendix D. IRB Approval Letter



### Research Integrity and Compliance The University of Texas at Brownsville

Matthew Johnson, Ph.D.  
IRB Chair

June 23, 2014

Edward Stiner  
The University of Texas at Brownsville  
One West University Blvd.  
Brownsville, Texas 78520  
RE: IRB-HS Approval

Study Title: "The Effects of Enhanced Discharge Education on  
Knowledge Retention in First Time Stroke/TIA  
Patients"

Protocol #: 2014-062-IRB

Dear Mr. Stiner,

In accordance with Federal Regulations for review of research  
protocols, the Institutional Review Board – Human Subjects of  
The University of Texas at Brownsville has reviewed your study as  
requested.

The IRB-HS grants its approval for this project contingent on compliance with the following items. You may make as many  
copies of the stamped consent form as are necessary for your activity. All consent forms MUST bear the UTB IRB stamp  
indicating approval.

Responsibilities of the Principal Investigator also include:

- Inform the IRB-HS in writing immediately of any emergent problems or proposed changes.
- Do not proceed with the research until any problems have been resolved and the IRB-HS have reviewed and approved any changes.
- Report any significant findings that become known in the course of the research that might affect the willingness of the subjects to take part.
- Protect the confidentiality of all personally identifiable information collected.
- Submit for review and approval by the IRB-HS all modifications to the protocol or consent form(s) prior to implementation of any change(s).
- Submit an activity/progress report regarding research activities to the IRB-HS on no less than an annual basis or as directed by the IRB-HS through the Continuing Review Form.
- Notify the IRB-HS when study has been completed through submission of a Project Completion Report.

Should you have any questions or need any further information concerning this document please feel free to contact me at (956) 882-8888 or via email at [Matthew.Johnson@utb.edu](mailto:Matthew.Johnson@utb.edu).

Sincerely yours,

*Matthew Johnson, Ph.D.*

Matthew Johnson, Ph.D.  
IRB – Chair

Approval Type:

- ☐ Full Board Review
- ☒ Designated Member Review
- ☐ Continuing Review
- ☐ Change request/Modification/Amendment
- ☐ Exempt Category
- ☒ Expedited Category 7

Approval Period:

Start Date: June 23, 2014

End Date: June 22, 2015

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## Appendix E. Hospital Stroke Discharge Follow-up Questionnaire

Date: \_\_\_\_\_ Time: \_\_\_\_\_

### Person Participating in Survey

- ☐ Patient
- ☐ Family \_\_\_\_\_  
Relationship
- ☐ Other: \_\_\_\_\_  
Relationship

Surveyor: \_\_\_\_\_

1. Have you followed up with your doctor? Or do you have an appointment?
  - ☐ Yes
  - ☐ No
2. Was your stroke information packet helpful?
  - ☐ Yes
  - ☐ No

If no, what information would have been helpful?

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3. Do you understand the medications you are on?
  - ☐ Yes
  - ☐ No, If NO, encourage the patient to call their physician
4. Can you tell me the signs of Stroke? (The patient or family member should tell you, **FAST**-facial droop, arm weakness or drift, speech problems, and time of last known normal and to call 911).

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Comments:

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