Cerebrovascular Accident Behavioral Modification Education for High-Risk Women

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Abstract

Cerebrovascular accidents (CVAs) continue to be one of the leading causes of disability and death throughout the United States (U.S.). While both men and women are at risk for CVAs, more women have CVAs each year than men. Prevention, including CVA education and education regarding behavioral modifications, should be an essential aspect of health care to lower overall risk and incidence of CVAs in women. The primary purpose of this project was to develop and implement an educational session that would incorporate behavioral modification interventions for women who are at high-risk for CVAs. This project was conducted by a Doctor of Nursing Practice (DNP) student and implemented through an education and behavioral modification empowerment class. The class consisted of 30 women currently enrolled in the well-integrated screening and evaluation for women across the nation (WISEWOMAN) program at Jordan Valley Community Health Center. Outcomes of the interventions evaluated through the Stroke Knowledge Test and the Cerebrovascular Attitudes and Beliefs Scale and results were analyzed using a Wilcoxon signed rank-test. Results from this project showed that women did increase their knowledge related to CVA and the risk factors related to CVA. However, the women involved in the project were not more motivated after the educational session to make the behavioral modifications required to lower overall risk of CVA. More strenuous educational and behavioral modification research may be needed to understand the information necessary for these women to implement lifestyle behavioral modifications to lower their overall risk of CVA.

Keywords: cerebrovascular accidents, women, education, WISEWOMAN, behavioral modifications, cardiovascular disease, hypertension, atrial fibrillation, hyperlipidemia, tobacco abuse, and women identified as high-risk for CVA
Cerebrovascular Accident Education for High-Risk Women

Introduction of the Issue and Background of CVA

Cerebrovascular Accidents (CVAs) have been recognized as one of the leading causes of death in the United States (U.S.) and is a major cause of disability (Persky, Turtzo, & McCullough, 2010). CVAs account for nearly 10% of deaths worldwide and are ranked as a leading cause of disability around the world (Addo et al., 2012). It is estimated that someone in the U.S. has a CVA every 45 seconds. This statistic means that 700,000 Americans will experience a new or recurrent CVA this year alone, and over 163,000 people will die from CVA or complications related to CVA (Thom et al., 2006). While men and women are both at risk for CVA, 55,000 more incidents of CVA will occur in women than men each year (Thom et al., 2006).

The U.S. currently spends more than 10% of the Medicare budget and more than 1.7% of the overall national health expenditures on CVAs each year (Ovbiagele et al., 2013). Currently, the U.S. spends roughly $71.55 billion per year on CVA expenses, and it is expected to increase to approximately $184.13 billion per year by 2030 (Ovbiagele et al., 2013). According to these statistics, the indirect costs of CVAs will grow from $33.65 billion in 2012 to more than $56.54 billion by 2030 (Ovbiagele et al., 2013). However, these figures are not inevitable as most cardiovascular disease, including CVA, are “preventable [or] at least can be delayed until old age with less chronic morbidity, with potential for fewer events, less disability, and even lower costs” (Weintraub et al., 2011).

Local Issue of CVA and Diversity Considerations

Considering the statistics mentioned above on rising health care concerns and costs associated with CVAs in the U.S., it is vital to understand these figures at a local level for
Greene County, Missouri. In 2013, the entire state of Missouri reported 149,720 patients aged 18 and above were diagnosed with a CVA; 26,333 of these occurred in Greene County alone (“Stroke Data Profile: Missouri,” n.d.). The statistical data of these CVAs varied widely between Caucasian and African American patients and were correlated with significant preventable risk factors such as hypertension, hyperlipidemia, obesity, physical inactivity, and tobacco abuse (“Stroke Data Profile: Missouri,” n.d.). In Missouri, from 2003-2013, African Americans had a state CVA rate of 60.9 compared to Caucasian CVA rate of 46.4 per 100,000 adults (“Stroke Data Profile: Missouri,” n.d.). These figures also showed the disparity between sexes in Missouri and Greene County. In 2013, 68,355 male patients in Missouri were diagnosed with a CVA compared to the 81,366 females with the same diagnosis (“Stroke Data Profile: Missouri,” n.d.). This statistical data specific to Missouri shows a 19% increase in women diagnosed with CVA over men, and support the national data statistics (Mozaffarian et al., 2015; “Stroke Data Profile: Missouri,” n.d.).

**Problem Statement and Improvement with Purpose**

More than 80% of CVAs are preventable according to the National Stroke Association (NSA) (Mozaffarian et al., 2015; “National Stroke Association,” n.d.). However, the lack of CVA prevention education for women in the U.S. is significant. Women often do not have an accurate risk perception of CVA, are unable to identify their personal risk of CVA, and are not undertaking preventative measures, such as lifestyle modifications needed to lower their overall risk of CVA (Dearborn & McCullough, 2009). While the data shows the significant risk of CVA, especially for women, in the U.S.; CVA education for women related to risk factors and signs and symptoms are below optimal levels (Cheryl Bushnell, 2008; Ferris, Robertson, Fabunmi, &
The NSA also found that only 27% of women polled could name more than two of the six primary CVA symptoms ("Women and Stroke," n.d.).

The purpose of this project was the development, implementation, and initial evaluation of a community education presentation outlining the modifiable risk factors for CVAs in women who have been identified as high-risk for the disease. The American Heart Association (AHA) emphasizes the importance of awareness and to provide a more “rigorous education to women at younger ages… because of womens’ increased risk of stroke with age; the onset of stroke risk factors such as obesity, hypertension, and diabetes mellitus, which occur at younger ages” (Cheryl Bushnell, 2008, p. 31).

**Facilitators and Barriers**

Facilitators of this project are directly related to the Doctor of Nursing Practice (DNP) student working closely with Jade Manczuk, the site coordinator for the Well-Integrated Screening and Evaluation for Women Across the Nation (WISEWOMAN) program at Jordan Valley Community Health Center (JVCHC) (see Appendix U). WISEWOMAN is a program through the Centers for Disease Control and Prevention (CDC) that offers low-income women an opportunity for health risk screenings, educational information, and community support group referral(s) (“WISEWOMAN,” n.d.). Female patients are referred to the program by their primary care providers or through community outreach health screening services, such as blood pressure screenings or CVA risk screenings, facilitated through the staff at JVCHC (“WISEWOMAN Program Requirements,” 2013). The women already enrolled in the WISEWOMAN program constitute a large population of women who are motivated for change and who would benefit from additional education on CVA prevention (Cheryl Bushnell, 2008; “WISEWOMAN,” 2011).
The foreseen barriers for this program are many. First, this population is comprised of low-income women with little ability to ensure adequate transportation to bring them to educational sessions and, second, the women at JVCHC are not enrolled to WISEWOMAN on a set schedule nor do they have schedules set for the recommended educational sessions which could affect the attendance of the scheduled educational session (Jade Manczuk, personal communication, March 3, 2016). Considering the expansive size of JVCHC combined with large number of health care staff consisting of 20 physicians, 16 nurse practitioners, and two physician assistants, it is difficult to educate and encourage participation of all providers to enroll their female patients that qualify for WISEWOMAN (Jade Manczuk, personal communication, March 3, 2016). Health care providers often fail to refer potential participants due to lack of knowledge or lack of time in the appointment to complete the referral (Jade Manczuk, personal communication, March 3, 2016). Lastly, the WISEWOMAN program focuses on heart health, diabetes prevention, and many other diseases in addition to CVA; this could cause study confusion or be “informational overload” for many of these women with an already low health educational level (“WISEWOMAN,” 2011).

**Review of Evidence**

**PICOT**

This project was developed and implemented based on the following research question: In adult female patients, ages 40-65, who are at higher than average risk for CVA, does behavioral modification education increase the knowledge of CVA risk and increase behavioral modification motivation after receiving the education in the family practice setting?
Search Strategies

A comprehensive review of studies was done using various databases including Cumulative Index to Nursing and Allied Health (CINAHL), Medline, Cochrane, PubMed, and National Guidelines. The studies included were predominantly conducted in the U.S.; however, the evidence used did include one article from Denmark, and one report used data collected from Europe, Canada, and the U.S. The following search terms were then used; CVA, women, education, behavioral modification, CVA risk, hypertension, hyperlipidemia, cardiac arrhythmias, tobacco abuse, obesity, and diabetes mellitus. The search resulted in more than 500 articles. Inclusion criteria included those studies published from 2007-2017, full-text articles, and those articles published in the English language. Exclusion criteria included unpublished articles, studies that were published before 2007, those articles and studies that were not peer reviewed, studies not printed in the English language, and studies that were performed on non-human subjects.

An organized collection chart (see Appendix A) was used to hold the data for this project and included author, year, digital object identifier (DOI) of the article, purpose, research design and level of evidence, sample and setting, measures and reliability, results, and limitations and usefulness. This chart allowed for the methodological organization and was also used to classify the data into topic sections and for visualization of the level of evidence for the information. Melnyk and Fineout-Overholt present a hierarchy of evidence (see Appendix B) where each article can be organized to fit from Level I (a systematic review or meta-analysis) to Level VII (opinions from authorities or expert opinions) (2015). The search resulted in three Level I studies, five Level II studies, eight Level III studies, eleven Level IV studies, five Level V studies, six Level VI studies, and eight Level VII studies (Melnyk & Fineout-Overholt, 2015a).
Evidence by Sub-Topics

The U.S. Preventative Health Services Task Force (USPSTF), the Agency for Healthcare Research and Quality, and the CDC set health goals and health objectives for the U.S. in a framework outlined in Healthy People 2020. Healthy People 2020 summarizes a list of health objectives aimed to improve the health of patients across the U.S. (Weintraub et al., 2011). The following are some of the risk factors for CVA in women, as defined by Healthy People 2020; cardiovascular disease, such as hypertension (HTN), hyperlipidemia, cardiac arrhythmias, tobacco abuse, a diagnosis of diabetes mellitus (DM), and obesity/physical inactivity (Weintraub et al., 2011).

Cardiovascular Disease as a Risk Factor for CVA

Cardiovascular disease, such as HTN, hyperlipidemia, and cardiac arrhythmias, increases the risk of CVA (C. Bushnell et al., 2014; Mozaffarian et al., 2016). Healthy People 2020 found that controlling these factors can be difficult because of the lack of knowledge of these diseases and inadequate education regarding the importance of management of these particular cardiovascular diseases (2015). However, evidence-based guidelines show that overall CVA risk can be lowered by controlling cardiovascular disease (Laffin & Bakris, 2016; Mozaffarian et al., 2016). Synthesis of evidence for cardiovascular disease for this project included ten studies.

Hypertension

Hypertension (HTN), both systolic and diastolic elevation, are directly correlated with CVA (Meschia et al., 2014). Meta-analysis and random control trials have confirmed that controlling HTN can decrease the chance for CVA by 30% in patients (Meschia et al., 2014). While treatment of HTN with drugs has shown to be effective, the American Stroke Association (ASA) guidelines and current guidelines from the AHA also recommend the use of lifestyle
modification to manage HTN (Armstrong & Joint National Committee, 2014). Lifestyle changes include weight loss, dietary modifications to add more fruits and vegetables with a low-fat diet, and limiting alcohol intake (Furie et al., 2011).

**Hyperlipidemia**

Hyperlipidemia has been shown to be an independent risk factor for CVA in women (Lewis & Segal, 2010; Mozaffarian et al., 2016). Analysis of more than 90,000 patients showed that “the larger the reduction in LDL-C, the greater the reduction in stroke risk” (Furie et al., 2011, p. 6). Considering that more than 73.5 million Americans have high cholesterol, the USPSTF suggests lipid screenings and treatment with medication and lifestyle modifications for all patients, with particular interest in patients at high-risk for CVA (Lewis & Segal, 2010; Mozaffarian et al., 2016).

**Cardiac Arrhythmias**

Cardiac arrhythmias, including atrial fibrillation (Afib), have also been identified as high-risk factors for CVA (C. Bushnell et al., 2014). Statistics show that if a person has been diagnosed with Afib, their risk for CVA increases approximately five times compared with a person who does not have Afib (Camm et al., 2012). Recent research has even suggested that 25% of CVAs that have an unknown cause, called Cryptogenic Stroke, could be directly related to subclinical or undiagnosed Afib (Healey et al., 2012; Sanna et al., 2014). Therefore, new guidelines recommend assessing for Afib in all patients through a one-time electrocardiogram (Camm et al., 2012; Healey et al., 2012; Mozaffarian et al., 2016). By diagnosing Afib, many complications, including CVA, can be prevented and should be considered a priority in primary care (Camm et al., 2012; Healey et al., 2012; Sanna et al., 2014).
Diabetes as a Risk Factor for CVA

Diabetes mellitus (DM) is a growing concern throughout the world, including the U.S., and it is estimated that more than 374 million people across the world have DM (Peters, Huxley, & Woodward, 2014). It is also hypothesized that DM will increase by more than 50% in the next decade (Peters et al., 2014). Many individuals do not understand the increased risk for CVA when diagnosed with DM (Peters et al., 2014). Synthesis of evidence of DM for this project included four studies.

Elevated glycohemoglobin (HgbA1C), which is an average measure of blood glucose over three months, has been shown to be a high CVA risk factor (Zhao et al., 2014). Although the risk of CVA in patients with DM is universal regardless of age, the younger the patient is at diagnosis directly correlates with a higher risk of CVA (Khoury et al., 2013). Each year a patient has DM, the risk of CVA increases three percent (Banerjee et al., 2012). Thus, data continues to support a three to four-fold increase in the rate of CVA in patients who have DM compared with those patients who do not have DM (Khoury et al., 2013). It is imperative that patients understand the increase in the risk of CVA by having the diagnosis of DM and also understand the importance of controlling the disease and implementing behavioral modifications to lower CVA risk (Khoury et al., 2013).

Obesity as a Risk Factor for CVA

Obesity, defined as a Body Mass Index (BMI) over 30, has been identified as a precursor for HTN, DM, and hyperlipidemia (Strazzullo et al., 2010; Yatsuya et al., 2010). Synthesis of evidence on obesity for this project included five studies. There is also a correlation between the rise in obesity and the increase in HTN and hyperlipidemia, further increasing women’s risk of CVA (Towfighi, Zheng, & Ovbiagele, 2010). Therefore, obesity has been identified as a
modifiable independent risk factor for heart disease and CVA and is a predictor of premature mortality in patients at risk (Goldstein & Fu, 2015).

Women aged 35-54 years old are more likely, when compared to male patients, to be obese and the CVA incidences have almost tripled over the last two decades in women in this age group (Towfighi et al., 2010). Randomized control trials on the effect of obesity on CVA have shown that overweight women (BMI 25-29) are 22% more likely to have a CVA and obese women (BMI 30-39) are 64% more likely to suffer a CVA when compared to normal weight (BMI 19-24) individuals (Strazzullo et al., 2010). Obesity as a risk factor for CVA has been shown to be independent of race, age, and geographic region and should be a priority when discussing behavioral modifications that can lower CVA incidence in women (Yatsuya et al., 2010).

Physical activity has been identified as a solution to many of the cardiovascular risk factors for CVA such as HTN, hyperlipidemia, DM, and obesity (Sattelmair, Kurth, Buring, & Lee, 2010). There is an inverse relationship associated with daily physical activity and total risk of CVA; this shows that increasing physical activity for women at risk for CVA can lower their overall risk CVA risk and lower other factors such as HTN, hyperlipidemia, and DM (Sattelmair et al., 2010). By simply walking 15 minutes a day, or 90 minutes total per week, many female patients who have heart disease or who are obese can lower the risk of CVA (Sattelmair et al., 2010; Wen et al., 2011).

**Tobacco Abuse as a Risk Factor for CVA**

The Surgeon General reports have long identified smokers, including both those who smoke and those exposed to second-hand smoke, are at an increased risk of cardiovascular disease, including CVA (“50 Years of Progress: A Report of the Surgeon General,” 2014).
Synthesis of evidence for tobacco abuse for this project included five studies. In current analysis of data from more than four million patients, more than 42,000 CVAs, and more than 81 cohort studies worldwide confirmed cigarette smoking is a principal independent risk factor for CVA; and smoking drastically increases the risk for CVA when combined with other risk factors such as heart disease, obesity, or DM (Peters et al., 2014).

It is imperative that women understand the dose-response relationship between cigarette smoking and risk of CVA (Bhat et al., 2008). Each cigarette smoked increases the risk factor of CVA by a factor 1.014 and for each additional pack per year of smoking, the overall risk of is raised CVA by approximately 1.035 times (Bhat et al., 2008). This relationship could be a vital modifiable risk factor for patients at risk for CVA (Bhat et al., 2008).

Conversely, it is also imperative that women understand that with smoking cessation, CVA risk can decrease significantly (Bhat et al., 2008). Studies have proven that CVA risk related to smoking can fall to the lowest level within five years of smoking cessation (“50 Years of Progress: A Report of the Surgeon General,” 2014; Bhat et al., 2008). According to recent statistics, more than 20% of women ages 25-44 continue to smoke; therefore, women need to understand that by quitting smoking, CVA risk decreases considerably at three years and by five years of smoking cessation, the risk of CVA for these former smokers is actually equal to the level of risk in patients who have never smoked (Bhat et al., 2008).

**Theory**

**Health Belief Model**

Hochbaum and his colleagues developed the Health Belief Model (HBM) in the 1950s (Green & Murphy, 2014; “The Health Belief Model,” 2016). There are four main concepts related to the HBM: the individual’s perceptions, modifying factors, the likelihood of action, and
self-efficacy. These concepts can offer aid in the predictions of the behavior of patients when faced with a potential health problem (Syx, 2008). The model’s ability to explain and predict patients’ behaviors demonstrates its repeated use in the development of community health educational and interventional programs to improve health behaviors (Carpenter, 2010).

According to the HBM, the determinates of behavior change in patients are dependent on two main factors; if a patient believes that they are at risk of a CVA and if the patient perceives the seriousness of the disease (Sullivan, White, Young, & Scott, 2009).

Using the HBM, recent research has demonstrated that health beliefs of patients can predict the intention of behavioral modifications to lower overall CVA risk (Sullivan et al., 2008, 2009). The HBM has been repeated numerous times in studies and community health program(s) and still is associated with numerous cases of behavioral modification and many positive health outcomes (Carpenter, 2010). Researchers suggest that CVA educational programs based on the HBM and targeted toward beliefs about perceived benefits of behavioral modifications aimed specifically at women who are at high risk of CVA will increase prevention-seeking behavioral education and increase preventative behavioral modifications (Mosca et al., 2006; Sullivan et al., 2008).

Methods

Approval and Site Approval

The University of Missouri-Kansas City (UMKC) Institutional Review Board (IRB) was involved in approval of the proposed project (see Appendix S). The proposed CVA educational and behavioral modification program fits into the UMKC IRB category of expedited review category seven and therefore underwent strenuous review and approval by the IRB before implementation of the project (OHRP, n.d.). The IRB of the CDC had already approved JVCHC
as a health care organization to facilitate the WISEWOMAN program (“WISEWOMAN Program Evaluation Toolkit,” 2015). The aim of the IRB approval is to protect the researcher, the institutions involved, and all potential project participants (Moran, Burson, & Conrad, 2014). According to Jade Manczuk of JVCHC, the purpose of the project coordinates completely with the goals of the WISEWOMAN program and Ms. Manczuk officially offered to accept the proposed project in to be conducted at JVCHC on March 3, 2016 (personal communication, March 3, 2016).

Ethical Issues

CVA affects women across all ages, races, and geographic locations. The incidence of CVA is three times higher in low-income patients when compared to patients who have middle-to-high income (Addo et al., 2012). This is an important aspect because those included in this particular study are in lower socioeconomic classes. Protection of the vulnerable patient population was a priority in this project (Melnyk & Fineout-Overholt, 2015b). In order to protect patient confidentiality and potential author bias, the data collected was completed through a numbering system designed by Jade Manczuk, which will also include demographic information that was reviewed and analyzed following the data collection phase of the project (Jade Manczuk, personal communication, March 3, 2016).

According to the CDC, geographic location in the U.S. also plays a significant role in the risk for CVA (2015). Patients living in the in Central and Southeastern regions of the U.S., including Missouri, are at a higher risk of CVA compared to those living in other areas of the U.S. (“National Heart Disease and Stroke Maps,” n.d.). All of these aspects were important to keep in mind when developing this research project. It is vital to keep geographic location, race, and culture in mind when developing a research project because culture has a strong impact
during interventions and the overall experience (Bueno, Ghafoor, Greenberg, Mukerji, & Yeboah, 2013).

**Funding**

The total cost for the proposed DNP project is $983.59, which was provided by JVCHC (See Appendix C). The majority of the expenses were related to the development and implementation of the project. PowerPoint presentation development and development of patient handouts for the classroom were estimated at $800.00. Printing and test taking equipment cost approximately $142.00, and snacks and beverage options for participants during the educational session(s) were $41.00. The teaching environment, including the room, tables, chairs, projector, and screen were all donated by the JVCHC through the WISEWOMAN program. Data analysis for the project was conducted by the UMKC statistician, Dr. Cheng, free of charge. The data was then reported back to the DNP student implementing this project.

**Setting and Participants**

The majority of the project occurred in a classroom located on the JVCHC main campus in Springfield, Missouri. Participants for this educational project included women enrolled in the WISEWOMAN program. The WISEWOMAN program requires that women, aged 40-65, qualify for categories related to low income and be uninsured or underinsured (“About the WISEWOMAN Program,” 2015). The sampling method for the project was purposeful/purposive sampling because the female patients were already enrolled in the WISEWOMAN program and are encouraged to participate in at least three educational sessions while enrolled (Melnyk & Fineout-Overholt, 2015b; “WISEWOMAN Program Requirements,” 2013). The goal of this project was to have at least 30 women involved.
Additional inclusion criteria for the sample of participants included women who had a diagnosis of HTN, hyperlipidemia, Afib, DM, obesity, or tobacco abuse. Exclusion criteria was already set by the WISEWOMAN program and included women of high socioeconomic status or those who had health insurance (“About the WISEWOMAN Program,” 2015). Additional exclusion criteria used in this project was women who were non-English speaking and women without a diagnosis of HTN, hyperlipidemia, Afib, DM, obesity, or tobacco abuse.

**Evidence-Based Practice Intervention**

The EBP intervention evaluated the effectiveness of the education to female WISEWOMAN participants related to CVA risk factors and behavioral modifications that female patients can do to lower their overall risk for CVAs (“About the WISEWOMAN Program,” 2015; Boden-Albala & Quarles, 2013; Fernandez, Davidson, Griffiths, Juergens, & Salamonson, 2009). The evaluation of the effectiveness of the education was completed and analyzed through pretests and posttests taken by each female participant (see Appendix I).

The first step in this EBP project intervention involved participant recruitment. Female participants were recruited by the health care providers at JVCHC and enrolled in the WISEWOMAN program (“WISEWOMAN Program Requirements,” 2013). Once these women have been enrolled in WISEWOMAN, the female participants who signed a consent to participate took the pretest on CVA knowledge using the Stroke Knowledge Tool (SKT) (See Appendix E). The evaluation of their current perception of CVA risk and the desire or likelihood of changes in their beliefs and potential implementation of these behavioral modifications measured through the Cerebrovascular Attitudes and Beliefs Scale (CABS-R) tool (See Appendix F) (Sullivan et al., 2008; Sullivan, White, Young, & Scott, 2010).
After the initial enrollment and pretests had been completed, the DNP student conducted a 30-minute educational session. This educational class consisted of a lecture and PowerPoint presentation format along with printed educational materials given to each participant (See Appendix L, Appendix M, and Appendix N). During the PowerPoint presentation, the participants received education on CVA, risks, modifiable risk factors, behavioral modifications, and the importance of controlling co-morbid diseases for women who are at high-risk for CVAs.

A question and answer session was offered at the end of class. The participants then took the same tests again (SKT and CABS-R) immediately following the question answer conclusion. Once completed, the participants were free to leave the session. All pretests and posttests were evaluated, documented, and given to the statistician through UMKC to conclude if these women have 1) increased their knowledge regarding CVAs and 2) were motivated to implemented behavioral modifications to control their co-morbid conditions to reduce their overall CVA risk. The timeline of the project ranged from August 1, 2016 until February 22, 2016 (see Appendix D for details).

**Change Process and Evidence-Based Practice Model**

The Evidence-Based Practice Change Model used both the Change Process Theory and the Evidence-Based Practice Model (Melnyk & Fineout-Overholt, 2015b). By using this model, the providers involved with WISEWOMAN can observe the intervention and evaluate the effectiveness of the education on motivation related to behavioral modifications that will lower women’s risk for CVA among participants in the program. This model follows the EBP with the following steps 1) assess the need for change in current practice, 2) locate the best evidence to support change, 3) critically analyze the evidence, 4) design practice change, 5) implement and
evaluate changes in practice, and 6) integrate and maintain the change in the practice (Terry, 2015).

**Study Design**

The study design is a simple interrupted time series design (Terry, 2015). This type of Quasi-Experimental research design allows for a one-group pretest/posttest design that can allocate for multiple pretest and posttest evaluation tools (Terry, 2015). Participants who were enrolled in WISEWOMAN were given two pretest tools, the SKT and CABS-R, to evaluate the educational level regarding CVA and the knowledge of behavioral modification strategies necessary to make the changes needed to lower overall CVA risk. The DNP student provided the educational aspect of the project and then administered the immediate posttest to evaluate the effectiveness of the education on CVA knowledge and the motivation of behavioral modifications recommended for women to lower overall risk of CVA.

**Validity**

The validity of the project was an essential aspect. The internal validity of this project was established through the DNP student adhering to the WISEWOMAN program protocols and by using the well-established and standardized evaluation tools (SKT and CABS-R) to evaluate the efficacy of the Cerebrovascular Accident Behavioral Modification Education for High-Risk Women (CABME) project (Melnyk & Fineout-Overholt, 2015a; Moran et al., 2014; Terry, 2015). The SKT and CABS-R provides 20 multiple-choice questions that will decrease the possibility of error or bias in a way that might be present with a short answer or fill in the blanks section (Melnyk & Fineout-Overholt, 2015a). Considering there was no control group for this project, the DNP student was unable to accurately measure the threats to internal validity, for example, selection bias or bias in the actual testing (Terry, 2015).
External validity is the ability to generalize the findings from a particular research project or sample of participants and be able to replicate the same results in a much larger population (Melnyk & Fineout-Overholt, 2015a). The population, as stated above, was women who are currently enrolled in the WISEWOMAN program. These women must fit certain criteria, both medically and financially, that may not allow the results of this proposed project to be generalized to the broader public or population outside of this project (Melnyk & Fineout-Overholt, 2015a). External validity was enhanced in this project by using the SKT and CABS-R tools that have been measured for validity and have been included in numerous studies similar to this project (Sullivan et al., 2008, 2009, 2010).

**Outcomes to be Measured and Measurement Tools**

The primary outcome measured in this proposed project was the improved knowledge of CVA and the behavioral modifications associated with lower overall CVA risk in women at high-risk. A secondary outcome was the disease control of co-morbid conditions of women involved in the study. While the primary outcome is the main goal of the study, it was hypothesized that co-morbid conditions could also be reduced along with CVA risk.

The measurement tools used for this project were the SKT and the CABS-R. The SKT, developed by Sullivan and Dunton, contains 20 multiple-choice questions regarding general knowledge of CVAs; this test was developed with input and guidance from the National Stroke Foundation (NSF) (Sullivan et al., 2008). The SKT has been evaluated during many projects and has shown high reliability and validity (Sullivan et al., 2008).

The CABS-R is designed to measure the CVA-related health beliefs that patients currently have (Sullivan et al., 2008). The CABS-R assesses the beliefs on CVAs related to the four dimensions from the HBM, which is also being used to guide this project (Sullivan et al.,
The CABS-R tool was also constructed with input from the NSF and has undergone rigorous testing and has shown to be a valid and beneficial evaluation tool (Sullivan et al., 2008, 2010). Dr. Karen Sullivan, author of both the SKT and CABS-R, was contacted and released both the SKT and CABS-R tools for use with modifications to fit the patient population of this proposed project (see Appendix G) (Karen Sullivan, personal communication, April 27, 2016).

**Quality of Data**

The quality of the data in this project was significantly limited by the low sample size of the participants involved (Melnyk & Fineout-Overholt, 2015a). The original goal of the project was to have a large sample size, approximately 30 women, to increase the confidence of the data (Melnyk & Fineout-Overholt, 2015a). However, ten female participants were enrolled and completed the project. Low sample size had a significant effect on the quality of data for this project and also affected the statistical significance that the educational interventions increased knowledge and behavioral modification motivation for the women involved in the project (Button et al., 2013).

**Analysis Plan**

The analysis plan for the demographic data and pretest versus posttest data was collected and sent to the UMKC statistician for statistical analysis. The pretest and posttest data were analyzed using a Wilcoxon Signed Rank Test. This allowed the benefits of education, the improvement of behavioral modification trials, and successes of the overall project to be evaluated (Moran et al., 2014). The Wilcoxon Signed Rank Test allows for multiple test comparisons in a small volume sample size (McDonald, n.d., personal communication, Dr. Lyla Lindholm, February 27, 2017).
Results

Setting and Participants

The setting of the project was at JVCHC. The project implementation phase started in August 2016 with the initiation of participant recruitment. Recruitment was done through advertisement flyers that were placed in each exam room, common patient areas, and provider lounges throughout JVCHC to promote the class and the content to be covered (see Appendix Q). Patients were also verbally recruited through WISEWOMAN classes, patient appointments, and word of mouth at JVCHC. Patient recruitment continued from August 2016 to November 2016. The CVA educational class sessions were initiated on November 30, 2016. It was anticipated that the class would consist of approximately 30 women, however, enrollment was low at only five women. An IRB amendment was completed to allow for more educational classes to increase enrollment. Participant recruitment continued through February 2017. Additional educational classes were taught January 11, 2017, zero participants enrolled, and February 22, 2017, with five participants enrolled.

A total of ten female participants were enrolled in the classes and in turn the project. The participants enrolled in the project were all Caucasian women with ages ranging from 43-65. The women involved in the project qualified due to the following conditions; low report of exercising, tobacco abuse, diagnosis of diabetes mellitus, women taking heart medications, diagnosis of hypertension, diagnosis of hyperlipidemia, women diagnosed as being overweight, and women who drank alcohol.

Intervention Course

The intervention for the project consisted of an educational class conducted through a lecture and PowerPoint presentation. When the women first arrived at the class, they received an
SKT and a CABS-R to fill out as a pretest, 30 minutes was allotted for the women to arrive, fill out the necessary forms, and get a plate of healthy snacks and water that were provided by the DNP student. Once completed, the educational intervention began; during the intervention, women received printed educational material as well as the lecture with PowerPoint. This type of delivery was aimed at targeting all of the women who may have differing learning styles, either auditory learning or visual learning (“Learning Styles,” n.d.). During the PowerPoint presentation, the participants received education on CVA and CVA types, risk factors, modifiable risk factors, behavioral modifications to lower risk of CVA, and the importance of controlling co-morbid diseases. Thirty minutes was allotted for the PowerPoint presentation and lecture aspect of the project.

Once the PowerPoint presentation was completed, a question and answer session was done. After all questions had been answered, which took on average of five to ten minutes, the women were given an SKT and CABS-R packet to fill out as a posttest. 30 minutes was allotted for this part of the project. Once these tools were completed, the women were free to leave the class. This exact process was implemented with each educational class that was scheduled and taught.

**Outcome Data by Sub-Topic**

Statistical analysis of the pretest and posttest data showed that the women involved in this project did improve their overall knowledge of CVA, which was evaluated through the SKT. The statistical data showed a significant result for the SKT, p=0.005, for the ten female participants involved (see Appendix R). This shows that the educational session with material provided did improve the participants’ overall knowledge of CVA, risk factors, and behavioral modifications and lifestyle changes necessary to lower overall risk. The other aspects of the project however,
did not show any statistically significant improvement in the women’s intention and motivation to change, which was measured through the CABS-R.

The CABS-R was divided up into nine categories with the number of participants who reported each category respectively; exercise with ten participants, smoking cessation with one participant, diabetes mellitus with one participant, cardiovascular medications with one participant, hypertension with 2 participants, hyperlipidemia with four participants, obesity with six participants, and alcohol intake with six participants. The categories of diabetes mellitus, cardiovascular medications, and hypertension each only had one to two participants and statistical analyses were unable to be completed in those categories. Due to the small sample size in each of the other categories, a Wilcoxon sample rank test was used for evaluation of each area of motivation and intention to implement behavioral modifications. None of the categories listed above showed statistical significance in the pretest versus posttest scores on the CABS-R tool. This meant that the educational information provided did not prove to motivate these women to make changes in their daily activities to lower their overall risk of CVA.

**Discussion**

**Successes**

Overall the CABME project was successful. The implementation aspect of the project was quite successful with female participants joining the class with the sessions provided. While the participant counts were not at the projected numbers, the number of participants did allow for the completion of the project statistical analysis was enough to provide statistical analysis. This analysis shows that the female participants in this program did benefit from being enrolled and involved in this project. The analysis and evidence gained from this class implementation and
investigation have shown that educational information can improve knowledge of CVA, risk factors for CVA, and behavioral modifications necessary to lower overall CVA risk.

**Study Strengths**

The strengths of this study were many; the setting of JVCHC was very conducive to this project and encouraged patients from all surrounding area clinics to attend. The staff was willing to assist these participants in reminder calls and letters for the class. The staff at JVCHC was interested in participating themselves, although not enrolled in the project, to understand the information provided. The staff stated that they wanted to be able to clarify questions at other WISEWOMAN or follow-up appointments for these participants if they had any on their next visit(s). The physicians, health care providers, and other JVCHC staff were eager to refer patients, pass out educational flyers for the project, and willing to learn the information that was provided. The JVCHC also provided the space for the project to be implemented, which made the location convenient for the participants to attend, as it was at the main campus and centrally located on the campus.

The implementation of the project was successful due to several factors. First, the pretests and posttests were completed in the same setting. Second, the setting allowed for the ease of follow-up for the female participants and reduced the risk of non-compliance with the posttests. Third, the patient population often had difficulties with transportation and/or financial issues that prevented them from attending follow-up meetings at their regular primary care visits and would only be enhanced at elective educational sessions (J. Manczuk, personal communication, January 11, 2017).
Results Compared to Evidence in Literature

In the past few decades there have been many transitions in CVA care provided to patients; the shift from acute CVA management and recovery to CVA prevention and education have been introduced by the World Health Organization and the Global Stroke Services Action Plan (Lindsay, Furie, Davis, Donnan, & Norrving, 2014). Research and published studies have shown that CVA educational program can improve knowledge on CVA and education on behavioral modifications to lower overall risk of CVA (Rasura et al., 2014). These programs have been shown to be most effective when implemented in community settings to specific patient populations (Rasura et al., 2014).

The recent studies demonstrate that the effectiveness of CVA education programs has benefits regarding improved outcomes related to increased patient knowledge, risk perception, and health beliefs, in particular for those patients in high-risk populations; however, limited evidence of patient compliance and behavioral modifications for primary prevention of CVA have been shown in the literature (Meschia et al., 2014; Yuki & Kudo, 2011). One example of success in educating women on CVA is the Beauty Shop Stroke Education Project (Kleindorfer et al., 2008). In this study, women were educated on CVA risk, CVA signs and symptoms, and when to call 9-1-1 all while getting their hair done in a local beauty shop (Kleindorfer et al., 2008). Results showed that even in a casual environment, such as a beauty shop, womens’ knowledge on CVA improved (Kleindorfer et al., 2008). This study also had limitations in their female participants understanding CVA risk factors and therefore not able to understand how to implement behavioral modifications, which correlates with the findings from the CABME project implemented at JVCHC (Kleindorfer et al., 2008).
Limitations

Internal Validity Effects

The control of the effectiveness of the internal validity of this project was established through the DNP student adhering to the WISEWOMAN program protocols at JVCHC and by using the well-established and standardized evaluation tools (SKT and CABS-R) to evaluate the efficacy of the CVA educational and behavioral modification project. The internal validity was also preserved as these female participants had never seen or used the SKT or the CABS-R (Moran et al., 2014; Terry, 2015). The threats were kept to a minimum by the DNP student sticking strictly to the script approved for the educational session, using the same PowerPoint presentation and handouts for each class, and using the standardized tools for evaluation of knowledge and behavioral modification motivations. The threat to the internal validity of this project was that there was no control group for this project so the measurement of threat was unable to be calculated. (Terry, 2015). The bias of emphasizing aspects of the educational PowerPoint or handouts could have also occurred during the educational sessions, which would threaten the internal validity of the project (Pannucci & Wilkins, 2010). Another area of data collection that could have affected internal validity was that the women involved in the project were given their educational materials during the PowerPoint presentation and that material was not collected during the posttest SKT and CABS-R; potentially women could have looked up the answers to the posttest evaluation tools on the material provided and altered the statistical data obtained for this project (Skelly, Dettori, & Brodt, 2012).

External Validity Effects

There were many factors influencing the external validity of this project. The first threat to external validity was that there were three different educational sessions offered. Each
educational session had new and different female participants. Each of these participants had different disease processes, which led them to the referral for the program. With the differing of the patient population in each educational session, each female participant brought varying questions and topics of conversation to the question and answer aspect at the end of each educational session. This meant that each class consisted of discussions related to different topics on CVA in general and the behavioral modifications to lower overall risk. These differing participants and various aspects of conversation could have been a threat to the external validity of this project.

**Sustainability of the Project**

Sustainability of this project is underway at JVCHC. According to Jade Manczuk, the handouts and information provided during the project are being handed out to women who would have qualified for this project (personal communication February 22, 2017). The class sessions however, are not going to be continued at JVCHC at this time. Due to the low participant numbers for the project, it is anticipated that the enrollment numbers would still lower overtime and would not prove to be a sustainable scheduled educational class at JVCHC (Jade Manczuk, February 22, 2017). However, since the results of the project showed that women’s knowledge on CVA and CVA risk factors did increase with the intervention, providers would continue with a quick educational intervention during patient appointments with the handouts that were used in the project (Jade Manczuk, personal communication, February 22, 2017).

**Efforts to Minimize Study Limitations**

The limitations of the project were vastly related to the limited number of participants in the project. Due to the low enrollment, many categories of the CABS-R data could not be analyzed and, therefore, were excluded from this discussion. If more participants had enrolled, it
would be anticipated that the motivation to make behavioral modifications to lower overall risk of CVA would have improved to allow for the statistical data to be analyzed. Further improvement for this project would have been to implement the project at many sites or to add more educational class sessions to increase the enrollment number to allow for more participants, which could have allowed for statistical analysis of many CABS-R categories. The low participant number also could have affected the generalizability to the female patient population at high-risk for CVA (Terry, 2015). Efforts to reduce this limitation include modifying the project design and IRB approval to allow for more educational sessions. Originally, the project consisted of only one educational session; however, after the first class there were only five female participants, so the project was modified to allow for more participants to enroll.

**Interpretation**

**Expected and Actual Outcomes**

The objective of the CABME project was to enroll 30 female participants who were currently enrolled in the WISEWOMAN program and were identified as having diagnoses that placed them at higher risk for CVA. The primary desired outcome for the project was that the women would improve on both their knowledge of CVA and CVA risk factors (evaluated through the SKT) and would improve on their motivation to make the necessary lifestyle changes to reduce their overall risk of CVA (assessed through the CABS-R) (Sullivan et al., 2008, 2009, 2010).

Ultimately, the total enrollment consisted of ten participants; which could be one of the reasons for the variation in expected outcomes and observed outcomes. The female participants that were involved did show increase in knowledge of CVA and CVA risk factors through the SKT. The women enrolled in the program also varied on the diagnoses that referred them to the
program, which meant that the statistical analysis of the CABS-R was inconclusive for some sections, such as hyperlipidemia, smoking, hypertension, and those patients taking cardiac medications.

**Intervention Effectiveness**

The CABME project was a success because of the supportive environment at JVCHC. JVCHC instills the importance of education for their patients at each patient interaction, which fosters multiple opportunities for patients to learn and understand their healthcare and disease processes. JVCHC offers multiple classes for different disease processes, but had never had a class specifically focused on CVA and CVA risks. This new class was well received by both the providers and patients at JVCHC, despite the low enrollment of the actual project.

Another aspect that assisted with the effectiveness of the project was that the educational intervention program for these women was a voluntary class, which meant that these women chose to come because of their desire to learn more about CVA, CVA risks, and behavioral modifications to lower their overall risk for CVA. The voluntary aspect could be directly related to the success of the improvement in knowledge on CVA for these female participants. The educational information provided during the intervention of the project was another aspect of the success of this project. The educational information was derived from credible and evidence-based sources such as the AHA, the CDC, and the NSA. These educational materials have been peer reviewed and approved for patients of all literacy levels.

**Intervention Revision**

Upon completion of the project, there were many aspects that could be revised for further research and educational interventions for women with high CVA risk. The intervention outcomes might have improved with the statistical significance in the behavioral modification
aspect if the educational class was more personalized through one-on-one educational sessions, perhaps at the end of a routine medical visit or WISEWOMAN interaction, rather than group education. The quick intervention and education may have proved to be more effective because the information provided could have been tailored to that individual’s specific CVA risk and modifications that would be needed to lower their specific risks for CVA. Studies have shown that a personalized educational intervention plan is preferred by patients and has shown to improve patient outcomes over group-based education (Kim, Caine, Currier, Leibovici, & Ryan, 2014).

Another possible aspect of revision of this study was that the method in which the measurement tools were provided to the patients. In this project, the pretest and posttest were given in the same educational session. Perhaps if female participants could have been evaluated immediately following the educational session, as they were in this project, and then assessed at their next provider appointment or WISEWOMAN educational session the results may have differed. It would also be interesting to note if the participants improved knowledge sustained a length of time, such as three months. Further study would be needed about the amount of information retained from the class. Studies have shown that patients are only able to retain information on CVA and CVA risks for approximately one week regardless of their CVA risk (Sullivan et al., 2009)

**Expected and Actual Impact to Health System, Costs, and Policy**

The AHA has developed a method to project the future costs of CVA and related care; the AHA estimates that by 2030, approximately 4% of the population in the US older than 18 will have a CVA. This means that the direct costs of caring for those patients with CVAs will increase from $72 billion to over $184 billion dollars (Ovbiagele et al., 2013). Indirect annual
costs related to CVA and CVA complications are expected to increase as well; Overall, total annual costs of CVA are expected to increase to $240.67 billion by 2030, which equates to approximately a 129% increase (Ovbiagele et al., 2013). Due to the startling increase in medical costs relate to CVA, the AHA has placed greater emphasis on executing effective preventive healthcare services, including education, will have both medical and societal benefits related to CVA that are cost-effective to the patients, providers, and healthcare institutions as a whole (Ovbiagele et al., 2013).

The CABME project was successful from a financial aspect. The total project costs at the end of the project was a total of $1,175.07. If this cost is divided among the ten participants, the total cost per patient enrolled in the project equates to approximately $117.50 per patient. According to the AHA, the average cost of a CVA per patient is approximately $150,000. This data shows that the educational intervention offered to these patients was a cost-effective way to potentially prevent a CVA and in turn potentially reduce the high medical costs associated with CVA and other devastating health complications related to the CVA (Luengo-Fernandez, Gray, & Rothwell, 2009).

The majority of the costs associated with this project were directly related to the development of the program, the printing of the educational material and evaluation tools, and the food and beverages supplied for the program participants. The funding for the project was provided through the Advance Practice Nurses of the Ozarks (APNO) Scholarship, which was awarded to the DNP Student in November 2017, with the total amount of $2,500. According to Jade Manczuk, the costs of the printing for the educational materials and the sustainability of the project will be incorporated into the patient educational budget at JVCHC provided through the facility FQHC grants funded through the federal government (personal communication, February
However, the project has yet to be implemented at JVCHC and is pending based on future meetings regarding the benefits of the project and the benefits to the patients involved (Jade Manczuk, personal communication, February 22, 2017).

Conclusions

Practical Usefulness of Intervention and Further Study

CVAs continue to be a leading cause of severe disability and death in the U.S.. Considering that more than 80% of CVAs are preventable, women need to understand CVA risk factors and the behavioral modifications, which can be implemented to lower overall CVA risk (Mochari-Greenberger, Towfighi, & Mosca, 2014; “Stroke facts,” n.d.; Towfighi et al., 2010). The effectiveness of CVA educational classes and education on behavioral modifications has been reviewed in many scientific projects; however these projects do not take gender, specifically women, into consideration (Jamieson & Skliut, 2009; Maas & Appelman, 2010). Since more women suffer from CVA when compared to male patients, future projects should focus more on women who are at high-risk of CVA (Mozaffarian et al., 2016; Thom et al., 2006). More CVA educational programs and programs directed toward women of diverse races, health statuses, and socioeconomic classes, would also be necessary to ensure external validity of this type of proposed project (Melnyk & Fineout-Overholt, 2015b; Mozaffarian et al., 2016).

Dissemination of this project started in the fall of 2016, with a poster presentation at the APNO Cradle to Grave conference in Branson, Missouri. Dissemination of this project will continue in April 2017 at the UMKC Health Science Student Research Summit and the University of Missouri-Kansas City School of Nursing. Considering that the statistical analysis of the data did show that educational intervention improves CVA knowledge, it is anticipated
that the results will be disseminated with groups which focus on women’s health at JVCHC and other local organizations focusing on women’s health and CVA.
References


https://doi.org/10.1161/STROKEAHA.109.566299


https://doi.org/10.1298/jjpta.Vol14_001

Appendix A
Synthesis of Evidence Table

<table>
<thead>
<tr>
<th>Author, Year, and DOI of Journal</th>
<th>Purpose</th>
<th>Research Design and Evidence Level</th>
<th>Sample &amp; Sampling, Setting</th>
<th>Measures &amp; Reliability (if reported)</th>
<th>Results</th>
<th>Limitations &amp; Usefulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Bushnell et al., 2014) 10.1161/01. str.0000442 009.06663. 48</td>
<td>Guidelines for the prevention of CVA in women from the AHA</td>
<td>Level= VII</td>
<td></td>
<td></td>
<td></td>
<td>Summarize data on CVA risk factors that are unique to and more common in women and give HCP EBP guidelines</td>
</tr>
<tr>
<td>(Mozaffarian et al., 2015) 10.1161/CIR.0000000 000000350</td>
<td>The guidelines and statistics of the AHA, CDC, NIG, and other government agencies on heart disease</td>
<td>Level= VII</td>
<td></td>
<td></td>
<td></td>
<td>Statistics, figures, preventative measures, and data on all cardiovascular disease and current recommendations for both male and female patients</td>
</tr>
<tr>
<td>(Lundburg and Volgman, 2016) 10.1016/j.tc</td>
<td>Discuss the burden of CVA in women and preventative measures</td>
<td>Level= VII</td>
<td></td>
<td></td>
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<td>Discusses awareness, risk factors, atrial fibrillation, treatments,</td>
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</tbody>
</table>
needed for a-fib and other diseases.

Discusses the Importance and Effect of Primary Prevention of Cardiovascular disease in men and women.

Limits: Not specific to women!

<table>
<thead>
<tr>
<th>Author, Year, and DOI of Journal</th>
<th>Purpose</th>
<th>Research Design and Evidence Level</th>
<th>Sample &amp; Sampling, Setting</th>
<th>Measures &amp; Reliability (if reported)</th>
<th>Results</th>
<th>Limitations &amp; Usefulness</th>
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</thead>
<tbody>
<tr>
<td>Melloni et al., 2010</td>
<td>Review the representation of women in clinical control trials r/t CVA</td>
<td>Review of 156 randomized clinical trials cited by the 2007 women’s prevention guidelines Level = III</td>
<td>Increase of women in studies, but it still remains low and could be unable to represent disease in larger population</td>
<td>CVA recommendations are not equal in gender. Most research can be attributed to male research participants, non-gender specific, and not applicable to female</td>
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<tr>
<td>(Petrea et al., 2009)</td>
<td>Reviews CVA incidence and disability in the Framingham Heart Study Participants</td>
<td>Analysis of Literature and Study Level= I</td>
<td>Participants in the Framingham Original (n=5119; 2829 women) and Offspring (n=4957, 2565 women).</td>
<td>1136 incident strokes (638 in women) over the study.. Women were significantly more disabled from CVA than men. Longitudinal (45 years) with all genders to review CVA statistics</td>
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<tr>
<td>(Dehlcendreff, Anderson, &amp; Olsen, 2015)</td>
<td>Studied differences between men and women with regard to CVA severity and survival</td>
<td>Review of Danish Stroke Registry, Register of Causes of Death. Level = V</td>
<td>Denmark between 2003 and 2012 (N=79, 617)</td>
<td>Women are more affected by CVA than men. The older the participant the worse the outcome after stroke. Information was available related to: age, sex, marital status, CVA severity, CVA subtype, socioeconomic status, and cardiovascular risk profile.</td>
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<tr>
<td>(Persky, Turtzo, McCullough, 2010)</td>
<td>Review of literature on women specific factors including CVA, risk factors, treatment, quality of care, outcomes and</td>
<td>Level = V</td>
<td></td>
<td>Good information and review of literature on all aspects of CVA specifically for women.</td>
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<tr>
<td>Author, Year, and DOI of Journal</td>
<td>Purpose</td>
<td>Research Design and Evidence Level</td>
<td>Sample &amp; Sampling, Setting</td>
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<td>Results</td>
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<tr>
<td>(Mochari-Greenberger et al., 2014)</td>
<td>(Reeves et al., 2008)</td>
<td>Study of sex differences in CVA presentation, severity, treatment, and early mortality.</td>
<td>Cohort Study Level = IV</td>
<td>1,136 participants from 1996-1999</td>
<td>Sex differences were mostly seen in women who were at an older age.</td>
<td>Shows differences in mortality in women compared with men, however only shows differences at older ages.</td>
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<tr>
<td>(Mochari-Greenberger et al., 2014)</td>
<td>(Reeves et al., 2008)</td>
<td>10.1212/WNL.0b013e3181d5a48f</td>
<td>Cohort Study Level = IV</td>
<td>1,136 participants from 1996-1999</td>
<td>Sex differences were mostly seen in women who were at an older age.</td>
<td>Shows differences in mortality in women compared with men, however only shows differences at older ages.</td>
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<tr>
<td>10.1016/S1474-4422(08)70193-5</td>
<td>Discusses the epidemiology, clinical presentation and outcomes of CVA Not specific</td>
<td></td>
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<td>Gives good statistical data on CVA in women in the US</td>
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**WOMENS CURRENT KNOWLEDGE OF CVA**

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<thead>
<tr>
<th>Author, Year, and DOI of Journal</th>
<th>Purpose</th>
<th>Research Design and Evidence Level</th>
<th>Sample &amp; Sampling, Setting</th>
<th>Measures &amp; Reliability (if reported)</th>
<th>Results</th>
<th>Limitations &amp; Usefulness</th>
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</thead>
<tbody>
<tr>
<td>(Mochari-Greenberger et al., 2014)</td>
<td>Evaluate contemporary knowledge of CVA warning signs and knowledge of when to</td>
<td>Cross-sectional survey of women in the United States aged ≥25 years identified through random-digit</td>
<td>English-speaking US women ≥25 years</td>
<td>Knowledge of CVA warning signs was low among a nationally representative sample of women, Use of English speaking participants only—no confirmation of race b/c telephone</td>
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<tr>
<td>10.1161/STROKEAHA.113.004242</td>
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<tr>
<td>Call 9-1-1</td>
<td>Level = IV</td>
<td>Dialing N = 1205</td>
<td>Especially Hispanics</td>
<td>Survey was used. Good because all women participants</td>
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<tr>
<td>(Dearborn &amp; McCullough, 2009)</td>
<td>Uses a theoretical model to understand CVA risk perception in high-risk women</td>
<td>A questionnaire addressed CVA knowledge, risk perception, risk factors, access to health care and demographics</td>
<td>Risk perception was low in women of all races and many women were not undertaking primary prevention behaviors.</td>
<td>The cohort was mostly white and higher income and had small sample size. Could not equate to overall female patient populating.</td>
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<tr>
<td>10.1161/STROKEAH.108.543272</td>
<td>Cohort study with questionnaires</td>
<td>805 women, ages 50 to 70, were selected with at least one risk factor for stroke N = 215</td>
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<tr>
<td></td>
<td>Level = IV</td>
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<tr>
<td>(Kling et al., 2013)</td>
<td>Studying the contradiction between awareness and perceived risk of cardiovascular disease in women</td>
<td>All attendees of the Go Red for Women events in 2007, 2008, 2010, and 2011 in Rochester, Minnesota, Optional participation</td>
<td>Screening was a brief survey to collect historical information and provide a health assessment and answering a questionnaire on stroke and stroke risk unique to women</td>
<td>99% were aware that CV disease is the leading cause of death in women. 50% perceived themselves to be at personal risk, although 65% were at risk by MDs and 12% were at high risk. Limited to only those who attended Go Red events. 98% of women were white and little diversity in the participants.</td>
<td></td>
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<tr>
<td>10.1089/jwh.2012.3744</td>
<td></td>
<td>From 2007 through 2011, 294 women underwent screening for blood chemistry, body mass index, and blood pressure. Participants also did general CV disease knowledge and risk factors and what to do to prevent</td>
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<tr>
<td>Author, Year, and DOI of Journal</td>
<td>Purpose</td>
<td>Research Design and Evidence Level</td>
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<td>Measures &amp; Reliability (if reported)</td>
<td>Results</td>
<td>Limitation &amp; Usefulness</td>
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<tr>
<td>(Mosca et al., 2006) 10.1161/CIRCULATIONNAHA.105.588103</td>
<td>This study examines barriers to women’s awareness, preventative health, and risk modifications related to risk.</td>
<td>Random-digit dialing N=1008</td>
<td>Rate of CVD awareness is greater in whites than women of color. And fewer than half of participants knew the risk reductions of stroke.</td>
<td>Good example of the need of education r/t CVA in women.</td>
<td></td>
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<tr>
<td>(Rosura et al., 2014) 10.1111/en e.12266</td>
<td>To describe the literature on the knowledge of stroke s/s and the need to contact EMS</td>
<td>Review of literature from 1996-2014 from Medline, EMBASE, Cochrane Library data bases. 22 intervention studies were reviewed</td>
<td>Questionnaires, to various sample sizes using various media methods and on site classes.</td>
<td>Mass media = expensive and not helpful. Community settings work best.</td>
<td>Only review of previous educational programs. Did not suggest new campaigns or offer</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Setting</td>
<td>Sample Size</td>
<td>Limitations</td>
<td>Sample size was low = possible skew results. Gives good theoretical model to use for program development.</td>
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<tr>
<td>Sullivan et al., 2008</td>
<td>Qualitative non-experimental with questionnaire</td>
<td>L = III</td>
<td>276 surveys distributed, 101 surveys were returned—76 used in the study total</td>
<td>Self report only on questionnaires (CABS-R &amp; SKT) Cronbach’s alpha: &gt; 0.67</td>
<td>Health beliefs are likely a high component of CVA prevention HBM is good tool to predict outcomes</td>
<td></td>
</tr>
<tr>
<td>(Sanders et al., 2014)</td>
<td>Prospective cross-sectional study</td>
<td>L = IV</td>
<td>Patients older than 18 admitted to the hospital unit with a diagnosis of acute ischemic stroke N=100</td>
<td>Test of Functional Health Literacy in Adults</td>
<td>Health literacy was most predictive form of education outcome retention</td>
<td></td>
</tr>
<tr>
<td>(Ferris et al., 2005)</td>
<td>Telephone survey using random-digit dialing June and July of 2003 N=1024 of women ages 25 and older. L= IV</td>
<td>37% stated they were not at all informed about CVA. It was higher than women 45 and older. 50% of the women underestim</td>
<td>Standardized 32-item questionnaire that included a mixture of Likert scale, open-ended, and recognition questions was administered</td>
<td>Good study with various races/ethnicities included. Limitations he study was conducted in English only, and</td>
<td></td>
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</tr>
<tr>
<td>Study</td>
<td>Description</td>
<td>Population</td>
<td>Methods</td>
<td>Results</td>
<td>Limitations</td>
<td></td>
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<tr>
<td>(Schneider et al., 2003)</td>
<td>To examine trends in public knowledge of CVA warning signs and risk factors</td>
<td>Population-based random-digit telephone survey in July-November 2000 in the greater Cincinnati, Ohio, region.</td>
<td>2173 survey respondents (were randomly identified based on their demographic similarities to the ischemic CVA population with regard to age, race, and sex.)</td>
<td>The survey was 29 questions (open ended, and then answering 3 CVA warning signs and 3 risk factors)</td>
<td>Results may not be generalizable to non-English-speaking women.</td>
<td></td>
</tr>
<tr>
<td>(Bhatt, Safford, and Glasser, 2015)</td>
<td>Review the REGARDS is a longitudinal study to determine the disparities in CVA-related mortality.</td>
<td>REGARDS was a longitudinal cohort study of 30,239 US AA and white adults ≥45 years of age to providing national data on CVA incidence</td>
<td>Looks at the differences in CVA-related mortality across USA.</td>
<td>Risk factors (traditional and non-traditional) were all supported related to CVA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Study was limited only in one city and the participants were not excluded based on English speaking ability.
and prevalence of CVA risk factors and to assess geographic and racial differences.

<table>
<thead>
<tr>
<th>Author, Year, and DOI of Journal</th>
<th>Purpose</th>
<th>Research Design and Evidence Level</th>
<th>Sample &amp; Sampling, Setting</th>
<th>Measures &amp; Reliability (if reported)</th>
<th>Results</th>
<th>Limitation s &amp; Usefulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Boden-Albala and Quarles, 2013)</td>
<td>Defines new approaches to CVA prevention and CVA education</td>
<td>Opinions of Authors</td>
<td>Level = VII</td>
<td></td>
<td></td>
<td>Great educational aspects of CVA education!</td>
</tr>
<tr>
<td>(Strazzullo et al., 2010) 10.1161/STROKEAH.109.576967</td>
<td>Shows that obesity as an independent risk factor for</td>
<td>Meta-Analysis of Cohort</td>
<td>Level = IV</td>
<td>Twenty-five studies with n=2,274,961 participants</td>
<td>Overweight and obese patients are at higher risk for CVA. This was independent of age, lifestyle, and other cardiovascular health.</td>
<td>Huge Sample size and supports PICOT of obesity as a modifiable risk factor for CVA</td>
</tr>
<tr>
<td>(Towfighi et al., 2010) 10.1161/STROKEAH.109.577510</td>
<td>Study looked at if there was a differences men versus women related to obesity as a CVA risk factor</td>
<td>Level = II</td>
<td>Individuals aged 35 to 64 years who participated in the study that was conducted in 2 waves: 1988 to 1994</td>
<td>Women had higher change in risk related to obesity, but the differences in years were not noted in men.</td>
<td>Whites only, but does give women specific data</td>
<td></td>
</tr>
<tr>
<td>Author, Year, and DOI of Journal</td>
<td>Purpose</td>
<td>Research Design and Evidence Level</td>
<td>Sample &amp; Sampling, Setting</td>
<td>Measures &amp; Reliability (if reported)</td>
<td>Results</td>
<td>Limitations &amp; Usefulness</td>
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<tr>
<td>(Yatsuya et al., 2010) 10.1161/STROKEAH.A.109.566299</td>
<td>Evaluates CVA in relation to obesity</td>
<td>Data from Atherosclerosis Risk in Communities Studies Level = VI</td>
<td>13,549 black and white participants aged 45-65 between 1987-1989</td>
<td>Obesity is a significant risk factor for CVA regardless of race</td>
<td>Limit: Results from old years, but still supports PICOT that obesity as a risk factor for CVA</td>
<td></td>
</tr>
<tr>
<td>(Sattelmair et al., 2010) 10.1161/STROKEAH.A.110.584300</td>
<td>Evaluates the effect of physical activity on lowering stroke risk</td>
<td>Level = III N= 39, 315</td>
<td>Shows that increased leisure time is associated with increase risk of CVAS, but the greater the physical activity the lower the risk of CVA</td>
<td>Shows modifiable risk factors for CVA includes obesity and losing weight can lower risk for CVA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Level</td>
<td>Study Description</td>
<td>Articles</td>
<td>Findings</td>
<td>Meta Analysis Category</td>
<td></td>
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<tr>
<td>----------------------------------------------</td>
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<td>-----------------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>(Peters, Huxley, and Woodward, 2014)</td>
<td>III</td>
<td>Estimate the relative effect of DM on CVA risk in women compared with men.</td>
<td>Systematic review and meta-analysis of published</td>
<td>The CVA risk associated with DM is higher in women than men.</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>(Shou, Zhou, Zhu, 2015)</td>
<td>IV</td>
<td>Studies from databases of PubMed, EMBASE, and Cochrane library</td>
<td>Eighteen studies containing totally 43,899 participants were included in the meta-analysis.</td>
<td>Showed that CVA recurrence risk of all stroke patients with DM was higher than patients without DM</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>(The Emerging Risk Factors Collaboration, 2010)</td>
<td>III</td>
<td>Looked to correlate with increased FBG to CVA risk</td>
<td>Meta Analysis of individual records</td>
<td>N= 698, 782</td>
<td>IV</td>
<td></td>
</tr>
<tr>
<td>(Banerjee et al., 2012)</td>
<td>IV</td>
<td>Examines DM duration and its affect on CVA risk</td>
<td>Case Control Cohort Study</td>
<td>N= 3,928 CVA free participants who were diagnosed with DM were assess annually</td>
<td>IV</td>
<td></td>
</tr>
</tbody>
</table>

Good evidence that DM risk factor is higher in women! Supports PICOT

Diabetes is an independent risk factor for CVA

Large Sample Size and still supports PICOT

Each year of diagnosed DM increased stroke risk by 3% Supports DM as a risk factor and that by having it for years can increase the overall risk for CVA Shows
need to control sugars when pre-diabetic

( Zhao, Katzmarzyk, Horswell, Wang, Johnson, and Hu, 2013)
10.1007/s00125-014-3190-3

Examines the sex differences in DM as a risk factor for CVA

Prospective analysis

N= 31,000
Over 6.7 years

High correlation of DM2 and stroke

Supports PICOT and large sample size!

CARDIOVASCULAR DISEASE AS A CVA RISK FACTOR

<table>
<thead>
<tr>
<th>Author, Year, and DOI of Journal</th>
<th>Purpose</th>
<th>Research Design and Evidence Level</th>
<th>Sample &amp; Sampling, Setting</th>
<th>Measures &amp; Reliability (if reported)</th>
<th>Results</th>
<th>Limitations &amp; Usefulness</th>
</tr>
</thead>
</table>
| (Healey et al., 2012) 10.1056/N EJMoa1105575 | Prospectively to evaluate subclinical episodes of rapid atrial rate could be r/t increased risk of ischemic CVA in patients who do not have evidence of AFIB | Retrospective study and randomized trial
Level = I and III | 2580 patients, 65 years of age or older, with HTN and no history of AFIB and followed them for 2 years | Study would have 90% power to detect an increase in the annual risk of ischemic CVA | 11 of the 261 subclinical AFIB had been detected before 3 months had an ischemic CVA or systemic embolism | Useful to show that subclinical A-fib is r/t CVA in men and women |
| (Sanna et al., 2014) 10.1056/N EJMoa1313600 | Current guidelines suggest performing 24 hour ECG | Cryptogenic Stroke and Underlying AF | Patients were enrolled at 55 centers in Europe, Canada, | | | Did not directly relate all CVAs to undetected AFIB. |
monitoring to rule out AFIB in new CVA patients and the United States between June 2009 and April 2012.

### TOBACCO ABUSE AS A CVA RISK FACTOR

<table>
<thead>
<tr>
<th>Author, Year, and DOI of Journal</th>
<th>Purpose</th>
<th>Research Design and Evidence Level</th>
<th>Sample &amp; Sampling, Setting</th>
<th>Measures &amp; Reliability (if reported)</th>
<th>Results</th>
<th>Limitation &amp; Usefulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Peters, Huxley, and Woodward, 2013) 10.1161/STROKEAH A.113.002342</td>
<td>Systematic review and meta-analysis to estimate the effect of smoking on CVA in women compared with men.</td>
<td>PubMed MEDLINE was systematically for population-based cohort studies published between January 1, 1966, and January 26, 2013. Level = II</td>
<td>Data from 81 prospective cohort studies that included 3980 359 individuals and 42 401 strokes were available</td>
<td>Smoking was an independent risk factor for CVA in both sexes.</td>
<td>Limit does not specify severity based on sex. Still supports the fact that tobacco use increased CVA risk</td>
<td></td>
</tr>
<tr>
<td>(Bhat et al., 2008) 10.1161/STROKEAH A.107.510073</td>
<td>Observe data on the dose-response relationship between smoking and CVA</td>
<td>Observational relationship from previous case control studies Level = III</td>
<td>Stroke Prevention in Young Women Study, a population-based case-control study of risk factors for ischemic CVA in women aged 15 to</td>
<td>Results suggest a strong dose-response relationship between cigarette smoking and ischemic CVA risk in women</td>
<td>Smoking cessation and dose reduction both benefit CVA reduction in women</td>
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<tr>
<td>49</td>
<td>Looked at correlation of tobacco and CVA</td>
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</tbody>
</table>
Appendix B
Levels of Evidence

Rating System for the Hierarchy of Evidence: Quantitative Questions

**Level I:** Evidence from a systematic review of all relevant randomized controlled trials (RCT's), or evidence-based clinical practice guidelines based on systematic reviews of RCT's

**Level II:** Evidence obtained from at least one well-designed Randomized Controlled Trial (RCT)

**Level III:** Evidence obtained from well-designed controlled trials without randomization, quasi-experimental

**Level IV:** Evidence from well-designed case-control and cohort studies

**Level V:** Evidence from systematic reviews of descriptive and qualitative studies

**Level VI:** Evidence from a single descriptive or qualitative study

**Level VII:** Evidence from the opinion of authorities and/or reports of expert committees

(Melnyk & Fineout-Overholt, 2015b)
### Appendix C

**Cost Table**

<table>
<thead>
<tr>
<th>Description</th>
<th>Calculations</th>
<th>Cost</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PowerPoint and Handout Preparation done by DNP Student</strong></td>
<td>80 hours at $10.00 per hour</td>
<td>$800</td>
<td></td>
</tr>
<tr>
<td><strong>Printing Materials for Patient Packets and Pretest and Posttest</strong></td>
<td>Ream of Paper: $27.00 Ink for Paper: $0.34/page</td>
<td>$139.20</td>
<td>Packets will be printed at DNP students home and assembled without cost</td>
</tr>
<tr>
<td></td>
<td>Approximately 10 pages (printed front and back) per packet for 15 students = $102.00</td>
<td></td>
<td>Prices based from Wal-Mart</td>
</tr>
<tr>
<td></td>
<td>15 pre and post tests to be printed (front and back) = $10.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Package of Pencils for Testing</strong></td>
<td>12 pack of pencils = $1.69</td>
<td>$3.38</td>
<td>2 packages of pencils needed for 15 participants</td>
</tr>
<tr>
<td><strong>Healthy Snacks for Participants</strong></td>
<td>1 case of bottle water = $11.00 1 vegetable tray = $10.00 1 fruit tray = $12.00 1 package of napkins = $3.00 1 package of plates = $5.00</td>
<td>$41.00</td>
<td>All based on prices from Wal-Mart</td>
</tr>
<tr>
<td><strong>Teaching Environment</strong></td>
<td>Room Table Chairs Projector Screen Computer Equipment</td>
<td>$0.00</td>
<td>Room, tables, chairs, projector, screen, and computer equipment will all be supplied by the Jordan Valley Community Health Clinic.</td>
</tr>
<tr>
<td><strong>Statistical Analysis</strong></td>
<td>UMKC Statistician</td>
<td>$0.00</td>
<td>Statistician is free of</td>
</tr>
<tr>
<td>Post Project</td>
<td>charge for UMKC DNP Students</td>
<td></td>
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<tr>
<td><strong>Total Cost</strong></td>
<td><strong>$ 983.59</strong></td>
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</tbody>
</table>
Appendix D
Proposed Project Timeline

- January-March 2016: Compile evidence that supports stroke education and behavioral modification to decrease risk of stroke
- March-May 2016: Design educational intervention
- May-July 2016: Prepare for IRB/institutional approval
- August 2016: Obtain UMKC IRB approval
- August-September 2016: Pre-implementation data collection
- September-November 2016: Educational intervention for patients and providers
- September-November 2016: Implementation of patient behavioral modifications
- October-November 2016: Post-implementation data collection
- December-January 2017: Present change statistics from educational intervention and behavioral modifications
1. The most **common** type of stroke occurs when
   (a) The blood supply to the brain is blocked
   (b) You are having a heart attack
   (c) There is bleeding in the brain
   (d) You've had too much sun
   (e) I don't know

2. Which of the following will double your risk of stroke?
   (a) If you are asthmatic
   (b) If you are diabetic
   (c) If you exercise too much
   (d) All of the above
   (e) I don't know

3. A type of irregular heartbeat known as Atrial Fibrillation (AF)
   (a) Decreases the risk of stroke
   (b) Doubles the risk of stroke
   (c) Increases the risk of stroke by more than 5 times
   (d) Is not a risk factor of stroke
   (e) I don't know

4. Which age group is more at risk of stroke?
   (a) 20-30
   (b) 31-50
   (c) 51-60
   (d) 61+
   (e) I don't know

5. The warning signs of Transient Ischaemic Attack (TIA) disappear
   (a) Within 24 hours
   (b) Within 48 hours
   (c) After several days
   (d) After several years
   (e) I don't know

6. Which of the following is a warning sign of stroke?
   (a) Sudden blurred vision
   (b) Paralysis on one side of the body
(c) Severe headache
(d) All of the above
(e) I don't know

7. For someone who has had a stroke, the main purpose of rehabilitation is to
   (a) Make sure they don’t take drugs
   (b) Keep them in hospital as long as possible
   (c) Improve their level of daily functioning
   (d) Keep their mind off it
   (e) I don’t know

8. Taking aspirin assists in preventing stroke by
   (a) Stopping the formation of blood clots
   (b) Getting rid of a headache
   (c) Settling your stomach
   (d) Relieving stress
   (e) I don’t know

9. You are at greater risk of stroke if
   (a) You are obese
   (b) You exercise regularly
   (c) You give up smoking
   (d) All of the above
   (e) I don't know

10. Once you have suffered a Transient Ischemic Attack (TIA)
    (a) You are less likely to have a major stroke
    (b) You are more likely to have a major stroke
    (c) You are less likely to have a heart attack
    (d) You are more likely to have a heart attack
    (e) I don't know

(Sullivan, personal communication, April 28, 2016)
Appendix F
Cerebrovascular Attitudes and Beliefs Scale-Revised

INFORMATION ABOUT THE QUESTIONNAIRE

Thank you for participating in this research.

Why does this questionnaire have parts and which ones should I complete?
There are three parts to this questionnaire:
- Part 1 asks you to provide some information about yourself;
- Part 2 asks specific questions about your feelings about stroke and it’s risk factors;
- Part 3 asks about your knowledge of stroke and it’s risk factors.

Everyone should answer all of the questions in Part One and Part Three. You need to answer only those questions that apply to you in Part Two.

When I get to Part 2, how will I know which questions to answer?
Part Two has questions about stroke risk factors that may apply to you. For example, if you smoke, you should complete the smoking questions. If you do not smoke, you should skip these questions. In Part Two, there are more instructions to help you decide which questions apply to you. These instructions appear at the top of the page in blue writing.

What should I do if I have any questions or if I do not want to answer a question?
If you have questions about this survey or if you wish to discuss stroke risk factors, please refer to the study information sheet accompanying this survey for contact details. If you do not wish to answer a particular question, feel free to skip it.

What should I do when I have finished this questionnaire?
There is a checklist at the end of the survey to help you ensure you have filled in all relevant parts. The checklist includes information about how to return your survey.

What should I do if I would like to be contacted in the future?
We would also appreciate the opportunity to contact you again in the future for follow up purposes. If you would like to participate in future research, please include your name, address and phone number. Your privacy is important to us, if you include your personal details, these will not be kept with your questionnaire and only the researchers will have access this information.

- Name: ____________________________
- Phone Number: _______________________ Best time to contact you: am / pm
• Address ____________________________
  ____________________________
1. Age: ____________________ years

2. Gender: ☐ Male ☐ Female

3. Highest level of education obtained?
☐ Primary school
☐ High school
☐ TAFE certificate
☐ University degree or diploma

4. Employment status:
☐ retired
☐ part-time or casual work
☐ full-time work

5. Main occupation (current or prior to retirement):
________________________________________

6. Is English a second language? ☐ Yes ☐ No

7. Do you have family history of stroke? ☐ Yes ☐ No

8. Have you had a stroke previously? ☐ Yes ☐ No

9. Have you had a transient ischaemic attack (TIA) previously? ☐ Yes ☐ No

10. Have you been diagnosed with any of the following?
☐ Atrial Fibrillation (irregular heartbeat)? ☐ Yes ☐ No
☐ Cardiovascular (heart) disease ☐ Yes ☐ No
☐ Diabetes ☐ Yes ☐ No
☐ High blood pressure ☐ Yes ☐ No
☐ High cholesterol ☐ Yes ☐ No

11. Are you overweight? ☐ Yes ☐ No

12. If you know your weight and height please write these here:
___________________________ weight (kilograms or stone)
___________________________ height (cms or inches)

13. Do you take medication (e.g., aspirin) to reduce your risk of stroke? ☐ Yes ☐ No

14. Do you smoke? ☐ Yes ☐ No
If Yes, how many cigarettes a day do you smoke? _____

15. Do you live:
☐ On your own
☐ With spouse or other family
☐ With assisted care
☐ In supported accommodation

16. If you live with others, do they smoke? ☐ Yes ☐ No

17. Do you drink alcohol? ☐ Yes ☐ No
If Yes, how many days a week do you drink?
☐ Once a week
☐ Twice a week
☐ 3–5 days a week
☐ 6–7 days a week
If Yes, On the days that you drink alcohol, how many standard alcoholic drinks do you usually have?
(One standard drink = 100ml wine, 285ml heavy beer, 425ml light beer, one nip of spirit)
☐ One a day
☐ Two a day
☐ 3–5 per day
☐ 6–7 per day
☐ More than 7 drinks per day

18. Do you see your GP regularly? ☐ Yes ☐ No
In a six month period estimate how often you would see your GP:____________________

19. In a typical week, I eat a meal I would consider high in fat:
☐ once a day
☐ three times a day
☐ once a week
☐ more than once a week
☐ I don’t typically eat high fat food

20. I exercise at least 30 minutes a day
☐ 7 or more times per week
☐ 5–6 days per week
☐ 3–4 days per week
☐ 1–2 days per week
☐ Less than once a week
☐ I don’t exercise

Everyone should answer these questions.

21. Please list any other current illness you have:
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

22. Please list any medications you are currently taking.  
   If you are unsure of your medications, there is a list of common medications near the survey return box.
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

23. How often do you do the following?

<table>
<thead>
<tr>
<th>Activity</th>
<th>More often prescribed</th>
<th>As often prescribed</th>
<th>Less often prescribed</th>
<th>Never</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>I monitor my blood pressure</td>
<td></td>
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<tr>
<td>I test my blood sugar levels</td>
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<td></td>
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<tr>
<td>I take or inject my diabetic medication</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I take my blood pressure medication</td>
<td></td>
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<td></td>
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<tr>
<td>I take my irregular heart beat medication(s)</td>
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<tr>
<td>I take my heart disease medication(s)</td>
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<td></td>
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<tr>
<td>I take medication(s) to reduce my risk of stroke</td>
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</tbody>
</table>

You are now beginning Part Two. Please read the instructions to see if you should answer each set of questions.

Stroke Risk Questionnaire: Part 2

Everyone should answer these questions. Please tick the box that applies.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>If I had a stroke the consequences would be serious</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>My life would be seriously affected if I had a stroke</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I had a stroke, I would have to change a lot of things in my life</td>
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</tr>
</tbody>
</table>
Stroke Risk Questionnaire: Part 2 Continued

Everyone should answer these questions. Please tick the box that applies.

<table>
<thead>
<tr>
<th></th>
<th>Strongly</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>It would be easy for me to exercise regularly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have a lot to gain from exercising</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>It is likely that I will undertake regular exercise in the next 6 months</td>
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<tr>
<td>I am afraid to exercise</td>
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<tr>
<td>It is likely that I will undertake regular exercise</td>
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</tr>
<tr>
<td>Exercise will help me avoid stroke</td>
<td></td>
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<tr>
<td>Most people who are important to me would want me to exercise</td>
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<tr>
<td>Exercising makes me feel better</td>
<td></td>
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<tr>
<td>It is likely that I will have a stroke if I don’t exercise regularly</td>
<td></td>
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</tr>
<tr>
<td>Generally speaking, I intend to undertake regular exercise</td>
<td></td>
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<td></td>
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<tr>
<td>It would be hard for me to exercise regularly</td>
<td></td>
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</tr>
<tr>
<td>The likelihood of my having a stroke is high if I don’t exercise</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I don’t have time to exercise</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Most people who are important to me would approve of me exercising</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercising interferes with my other activities</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I enjoy exercising</td>
<td></td>
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</tr>
<tr>
<td>I feel too embarrassed to exercise</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>I intend to undertake regular exercise in the next 6 months</td>
<td></td>
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</tr>
<tr>
<td>Exercising can be painful for me</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>My chances of having a stroke are high if I don’t exercise regularly</td>
<td></td>
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</tr>
</tbody>
</table>
**Stroke Risk Questionnaire: Part 2 Continued**

If you SMOKE please complete the questions below. If not, please go to the next page.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have a lot to gain by giving up smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The likelihood of my having a stroke is high if I don’t stop smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It is likely that I will stop smoking in the next 6 months</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Most people who are important to me would want me to stop smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>My risk of stroke would be less if I gave up smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It would be hard for me to stop smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I enjoy smoking too much to give it up</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I think it is likely I will have a stroke if I don’t stop smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Generally speaking, I intend to stop smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It would be easy for me to stop smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I would feel better if I stopped smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It is likely that I will stop smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>My chances of having a stroke are high if I don’t stop smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Giving up smoking would require too much effort</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Giving up smoking will help my future</td>
<td>□</td>
<td>□</td>
<td>□</td>
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<td>□</td>
</tr>
<tr>
<td>Most people who are important to me would approve of me quitting smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I am afraid to give up smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I intend to stop smoking in the next 6 months</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>My social life makes it hard to give up smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I would find it distressing to give up smoking</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</tr>
</tbody>
</table>
## Stroke Risk Questionnaire: Part 2 Continued

If you have DIABETES please complete the questions below. If not, please go to the next page.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>It would be easy for me to have regular diabetes checks</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Most people who are important to me would want me to have regular diabetes checks</td>
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</tr>
<tr>
<td>The chances of me having a stroke are high if I don’t have regular diabetes checks</td>
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</tr>
<tr>
<td>I intend to have regular diabetes checks in the next 6 months</td>
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<tr>
<td>I think it is likely I will have a stroke if I don’t have regular diabetes checks</td>
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<tr>
<td>It is likely that I will have regular diabetes checks</td>
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<tr>
<td>It would be hard for me to have regular diabetes checks</td>
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<tr>
<td>I can benefit from regular diabetes checks</td>
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<tr>
<td>I think it is likely I will have a stroke if I don’t take my diabetes medications as prescribed</td>
<td></td>
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</tr>
<tr>
<td>The likelihood of my having a stroke is high if I don’t have regular diabetes checks</td>
<td></td>
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<tr>
<td>I am afraid to check my blood sugar level</td>
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<tr>
<td>I find it too painful to check my blood sugar levels</td>
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<tr>
<td>Generally speaking, I intend to have regular diabetes checks</td>
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<tr>
<td>It takes too long to check my blood sugar levels for my diabetes</td>
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</tr>
<tr>
<td>Most people who are important to me would approve of me having regular diabetes checks</td>
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<tr>
<td>It is likely that I will have regular diabetes checks in the next 6 months</td>
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</tbody>
</table>
**Stroke Risk Questionnaire: Part 2 Continued**

If you take MEDICATION for diabetes, heart disease (including cardiovascular disease), irregular heartbeat (atrial fibrillation), or stroke please complete these questions. If not, please go to the next page.

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am afraid to take my medication</td>
<td></td>
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</tr>
<tr>
<td>Generally speaking, I intend to take my medication as prescribed</td>
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</tr>
<tr>
<td>The likelihood of my having a stroke is high if I don’t take my medication</td>
<td></td>
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<tr>
<td>I worry less if I take my medication</td>
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<tr>
<td>My chances of having a stroke are high if I don’t take my medication</td>
<td></td>
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</tr>
<tr>
<td>Most people who are important to me would want me to take my medication</td>
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<tr>
<td>I am embarrassed to take my medication</td>
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</tr>
<tr>
<td>I have a lot to gain by taking my medication</td>
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<tr>
<td>It is likely that I will take my medication as prescribed in the next 6 months</td>
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<tr>
<td>It would be hard for me to take my medication</td>
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<tr>
<td>It is difficult to remember to take my medication</td>
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<tr>
<td>I intend to have take my medication as prescribed in the next 6 months</td>
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</tr>
<tr>
<td>Most people who are important to me would approve of me taking my medication</td>
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</tr>
<tr>
<td>Taking my medication can make me feel ill</td>
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<tr>
<td>I have to give up other activities to take my medication</td>
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<tr>
<td>It would be easy for me to take my medications</td>
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<tr>
<td>It is likely that I will have a stroke if I don’t take my medication</td>
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</tr>
<tr>
<td>It is likely that I will take my medication as prescribed</td>
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<tr>
<td>Taking my medication will prevent me from having a stroke</td>
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</tbody>
</table>
**Stroke Risk Questionnaire: Part 2 Continued**

If you have HIGH BLOOD PRESSURE, please complete these questions. If not, please go to the next page.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most people who are important to me would approve of me getting my blood pressure checked regularly</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Generally speaking, I intend to have my blood pressure checked regularly</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I have a lot to gain by controlling my blood pressure</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The likelihood of my having a stroke is high if I don’t have my blood pressure checked regularly</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I intend to have regular blood pressure checks in the next 6 months</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>It would be hard for me to have regular blood pressure checks</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I think it is likely I will have a stroke if I don’t have my blood pressure regularly checked</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Checking my blood pressure regularly will help me prevent future stroke</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>It would be easy for me to have regular blood pressure checks</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Attending appointments for blood pressure checks is time consuming for me</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Controlling my blood pressure is a good way to avoid stroke</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My chances of having a stroke are high if I don’t have my blood pressure regularly checked</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>It is likely that I will have my blood pressure checked regularly in the next 6 months</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Most people who are important to me would want me to get my blood pressure checked regularly</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I find it difficult to attend appointments for blood pressure checks</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I am afraid to have my blood pressure checked</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
</tr>
</tbody>
</table>
Stroke Risk Questionnaire: Part 2. Continued

If you have HIGH CHOLESTEROL, please complete these questions. If not, please go to the next page.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would have to give up a lot to eat a low cholesterol diet</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The likelihood of my having a stroke is high if I don’t have my cholesterol regularly checked</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Generally speaking, I intend to have my cholesterol checked</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It is difficult for me to eat a low cholesterol diet</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>My chances of having a stroke are high if I don’t have my cholesterol regularly checked</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Having regular cholesterol tests will help me control my cholesterol levels</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Most people who are important to me would approve of me having my cholesterol checked regularly</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It would be easy for me to have regular cholesterol checks</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It is painful to have my cholesterol checked</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It is likely that I will have my cholesterol checked regularly</td>
<td>□</td>
<td>□</td>
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<td>□</td>
</tr>
<tr>
<td>It would be hard for me to have regular cholesterol checks</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Lowering my cholesterol levels is a good way for me to prevent stroke</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I think it is likely I will have a stroke if I don’t have my cholesterol regularly checked</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</tr>
<tr>
<td>It is time consuming for me to organise a low cholesterol meal</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Most people who are important to me would want me to have my cholesterol checked regularly</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
I like low cholesterol food

Having my cholesterol regularly checked will help me avoid future stroke

I intend to have regular cholesterol checks in the next 6 months

I have a lot to gain by controlling my cholesterol level

It is likely that I will have my cholesterol checked regularly in the next 6 months

**Stroke Risk Questionnaire: Part 2, Continued**

If you are **OVERWEIGHT**, please complete these questions. If not, please go to the next page.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>It would be easy for me to lose weight</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I have a lot to gain from losing weight</td>
<td></td>
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<tr>
<td>I intend to lose weight in the next 6 months</td>
<td></td>
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</tr>
<tr>
<td>Losing weight takes too much effort</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most people who are important to me would approve of me losing weight</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Losing weight would require starting new habits which I would find difficult</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It would be hard for me to lose weight</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>It is likely that I will lose weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am afraid that I would not be able to lose weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is likely that I will lose weight in the next 6 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My future will be healthier if I lose weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The likelihood of having a stroke is high if I don’t lose weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most people who are important to me would want me to lose weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would have to give up a lot to lose weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statement</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>---------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Generally speaking, I intend to lose weight</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My chances of having a stroke are high if I don’t lose weight</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Losing weight is a good way to prevent stroke</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I think it is likely I will have a stroke if I don’t lose weight</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
</tbody>
</table>
# Stroke Risk Questionnaire: Part 2. Continued

If you drink ALCOHOL, please complete these questions. If not, please go to the next page.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My risk of stroke is not affected by how much alcohol I drink</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Reducing my alcohol intake would require too much effort</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Most people who are important to me would want me to drink less alcohol</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It is likely that I will reduce my alcohol intake in the next 6 months</td>
<td>□</td>
<td>□</td>
<td>□</td>
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<td>□</td>
</tr>
<tr>
<td>It is likely that I will have a stroke if I don’t reduce my drinking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I have nothing to gain by drinking a lot of alcohol</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</tr>
<tr>
<td>I like the effects of drinking alcohol too much to drink less</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Generally speaking, I intend to reduce my alcohol drinking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Most people who are important to me would approve of me reducing my drinking levels</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It would be hard for me to reduce my drinking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>My chances of having a stroke are high if I don’t reduce my drinking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I can reduce my risk of stroke by not drinking too much</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The likelihood of my having a stroke is high if I don’t reduce my drinking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I enjoy drinking alcohol too much to drink less</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It would be easy for me to reduce my drinking</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I don’t enjoy drinking a lot of alcohol</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>I intend to reduce my alcohol intake in the next 6 months</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>It is likely that I will reduce my alcohol intake</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
The side effects from drinking lots of alcohol aren’t I pleasant to me

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
</table>

Office use only:
Centre________________________
You are now beginning Part Three

Stroke Risk Questionnaire: Part 3

Everyone should answer these questions. Please tick the box you think is correct.
4. The most common type of stroke occurs when
   - The blood supply to the brain is blocked
   - You are having a heart attack
   - There is bleeding in the brain
   - You’ve had too much sun
   - I don't know

5. Which of the following will double your risk of stroke?
   - If you are asthmatic
   - If you are diabetic
   - If you exercise too much
   - All of the above
   - I don't know

6. A type of irregular heartbeat known as Atrial Fibrillation (AF)
   - Decreases the risk of stroke
   - Doubles the risk of stroke
   - Increases the risk of stroke by more than 5 times
   - Is not a risk factor of stroke
   - I don't know

5. Which age group is more at risk of stroke?
   - 20-30
   - 31-50
   - 51-60
   - 61+
   - I don't know

6. The warning signs of Transient Ischaemic Attack (TIA) disappear
   - Within 24 hours
   - Within 48 hours
   - After several days
   - After several years
   - I don't know

6. Which of the following is a warning sign of stroke?
   - Sudden blurred vision
   - Paralysis on one side of the body
   - Severe headache
   - All of the above
   - I don't know

8. For someone who has had a stroke, the main purpose of rehabilitation is to
   - Make sure they don’t take drugs
   - Keep them in hospital as long as possible
   - Improve their level of daily functioning
   - Keep their mind off it
   - I don’t know

9. Taking aspirin assists in preventing stroke by
   - Stopping the formation of blood clots
   - Getting rid of a headache
   - Settling your stomach
   - Relieving stress
   - I don’t know

10. You are at greater risk of stroke if
    - You are obese
    - You exercise regularly
    - You give up smoking
    - All of the above
    - I don't know

11. Once you have suffered a Transient Ischemic Attack (TIA)
    - You are less likely to have a major stroke
    - You are more likely to have a major stroke
    - You are less likely to have a heart attack
    - You are more likely to have a heart attack
    - I don't know
### Stroke Risk Questionnaire: Part 3 Continued

**Everyone should complete this section. Please tick the box you think is correct.**

12. Surgery can sometimes help to prevent another stroke by
   - [ ] Giving a transfusion
   - [ ] Cutting off the supply of blood to the brain
   - [ ] Unblocking the arteries in the neck
   - [ ] Removing the arteries
   - [ ] I don’t know

12. What method of treatment is available for people who have had a stroke?
   - [ ] Medication
   - [ ] Rehabilitation
   - [ ] An operation
   - [ ] All of the above
   - [ ] I don’t know

13. The most important known risk factor for stroke is
   - [ ] Genetic
   - [ ] Heart attack
   - [ ] High blood pressure
   - [ ] Old age
   - [ ] I don’t know

14. Approximately how many Australians are affected by stroke every year?
   - [ ] 500
   - [ ] 1,000
   - [ ] 10,000
   - [ ] 50,000
   - [ ] I don’t know

15. If you drink alcohol excessively you are
   - [ ] Less likely to have a stroke
   - [ ] Twice as likely to suffer stroke
   - [ ] Three times as likely to suffer stroke

16. Which of the following is an example of a *physical* disability caused by stroke
   - [ ] The right arm is paralysed
   - [ ] There are problems with memory
   - [ ] Unable to speak properly
   - [ ] Having trouble doing things in the correct order
   - [ ] I don’t know

17. To reduce the risk of stroke you need to
   - [ ] Eat well and exercise regularly
   - [ ] Ensure your blood pressure is not too high
   - [ ] Monitor your cholesterol levels
   - [ ] All of the above
   - [ ] I don’t know

18. Smoking 20 cigarettes per day increases the risk of stroke by
   - [ ] 2 times
   - [ ] 4 times
   - [ ] 6 times
   - [ ] 8 times
   - [ ] I don’t know

19. If someone has a stroke, when should you ring for an ambulance?
   - [ ] Only ring if the symptoms stay after 24 hours
   - [ ] Always ring for an ambulance straight away
   - [ ] Just see your doctor when you can
   - [ ] You don’t need to ring an ambulance
   - [ ] I don’t know

20. Rehabilitation can assist someone who has
   - [ ] Loss of movement
   - [ ] Loss of speech or language
   - [ ] Loss of balance
   - [ ] All of the above
   - [ ] I don’t know
☐ Four times as likely to suffer stroke
☐ I don’t know

Survey Completion Checklist

Thank you for completing this survey.

We welcome any comments you have about this study. If you have any comments, please add them below:

When you have finished the questionnaire, please:

• Check you have answered all questions in Parts 1 and 3, and those questions that apply to you in Part 2.
  □ Complete questions Part 1
  □ Complete questions Part 3
  □ Complete sections of Part 2 that pertain to me
  □ Include your name, address and phone number if you would like help us by being contacted in the future.

• Return your survey to us:
  o by mail to Dr. Karen Sullivan School of Psychology & Counselling, Queensland University of Technology, Carseldine, 4034, QLD, OR
  o by leaving your survey at the collection box at your Senior Citizens Club.

Again, we sincerely thank you for your time and thoughtful responses.
Appendix G
Permission to Use Tools

Dear Dr. Sullivan,

My name is Patricia Lewien. I am a 3rd year student in the Doctorate of Nursing Practice (DNP) Program at the University of Missouri -Kansas City School of Nursing (UMKC). I am currently working on my DNP project. The goal of my project is to develop an educational program to motivate women at high risk for cerebrovascular accidents (CVA) to make behavioral modifications in their lifestyle in order to lower their overall risk for CVA. My objective is to evaluate the stroke knowledge of these women and to also evaluate their beliefs on CVAs. I plan to administer a pre-educational test and then a post-educational test to evaluate the overall success of the stroke educational class. The Stroke Knowledge Test and the Cerebrovascular Attitudes and Beliefs Scale- Revised that you have developed are both assessment tools that would be extremely beneficial to use in this project. I would be so grateful if you would grant me permission to use your tests for my proposed project.

I am proposing my project to the IRB in the next few months and I sincerely hope to be able to use the Stroke Knowledge Test and the Cerebrovascular Attitudes and Beliefs Scale- Revised as the tools to measure the effectiveness of my educational program. Also, considering the information in the Stroke Knowledge Test, I was hoping to change number 14 to address the number of strokes in the United States versus the published version that addresses Australia.

If you could please write back to me at your earliest convenience it would be much appreciated.
Thank you so much!
Sincerely,

Patricia Barnett Lewien
UMKC BSN-DNP Class of 2017
pabwd5@umkc.edu

Hello Patricia and thank you for your email. This use of these tests sounds very appropriate. I have attached them for your information. The CABS-R colour coding is removed from this test before use, but the colour coding shows you the items that are scored together to measure the beliefs. Yes, I agree that the items should be reviewed to ensure relevance to your local conditions.

Regards
Karen Sullivan, PhD.
Appendix H
Definition of Terms

1. **Evidence Based Practice (EBP)**- an approach to clinical decision making that involves making decisions in health care that is based on the best clinical evidence available at that time in addition to one’s own clinical expertise and patient values and preferences to improve the health outcomes of patients, groups, community, and the health system overall (Melnyk & Fineout-Overholt, 2015a).

2. **Doctorate of Nursing Practice (DNP)**- a graduate degree for advance nursing practice preparation and a terminal degree for clinical nursing professionals (Institute of Medicine (U.S.), 2001).

3. **WISEWOMAN**- (Well-Integrated Screening and Evaluation for Women Across the Nation) a program through the Centers for Disease Control and Prevention that provides services for low-income and uninsured women, aged 40-64, with chronic disease risk factor screenings, lifestyle modification programs, and referrals to services to prevent cardiovascular disease (“WISEWOMAN Home,” n.d.).

4. **Cerebrovascular Accidents (CVAs)**- also known as a “brain attack”- occurs when there is a lack of blood flow to an area of the brain and that part of the brain begins to die due to lack of oxygen (Buttaro, Trybulski, Bailey, & Sandberg-Cook, 2013; “Stroke facts,” n.d.).

5. **Diabetes Mellitus**- a group of diseases that are categorized by an elevated level of sugar or glucose in the blood. These elevations of glucose can damage the blood vessels throughout the body and lead to heart disease and CVA (Buttaro et al., 2013).

6. **Hypertension**- an elevated blood pressure (usually defined as a blood pressure over 140/90) that puts excess force of the blood pumping from the heart against the artery walls throughout the body and can damage them leading to heart disease and CVA (Buttaro et al., 2013).

7. **Hyperlipidemia**- a condition in which there are too many fat particles, also called lipids, in the blood stream. Examples of lipids include cholesterol and triglycerides. These fat particles can build up in the blood vessels and restrict blood flow, which can cause a heart attack or CVA (Buttaro et al., 2013).

8. **Cardiac Arrhythmias**- when the heart beat is not beating properly. These can include a heartbeat that is too fast, too slow, or irregular (Buttaro et al., 2013).

9. **Obesity**- a condition in which there is excessive body fat (a body mass index of over 30) that increases the risk of many health problems including diabetes mellitus, heart disease, and CVA (Buttaro et al., 2013).

10. **Quasi-experiments**- A type of experiment that tests the effects of a particular intervention or treatment, but does not meet the qualifications of a true experiment (such as random assignments or a control and comparison group) (Melnyk & Fineout-Overholt, 2015a).

11. **Paired T-Test**- A test that is done in research to determine if the differences in two groups was due to chance or to the intervention itself (Terry, 2015).

12. **Wilcoxon Signed Rank Test**- When two related samples are being compared, this test, a non-parametric statistical hypothesis test, can be used when the population mean rank differs (Terry, 2015).
Appendix I
Intervention Flow Diagram

1. Project Development
2. Patient Identification
3. Consent for Participation
4. Pretest Completion by Participants
5. Educational Intervention Session with Behavioral Modification Motivation Interventions
6. Posttest Completion by Participants
7. Posttest Repeated at Next Educational Class
8. Statistical Analysis of Effectiveness of Education and Behavioral Modification Motivation

(“The Health Belief Model,” 2016)
### Logic Model for DNP Project

**Student:** Tish Lewien

<table>
<thead>
<tr>
<th><strong>Inputs</strong></th>
<th><strong>Intervention(s)</strong></th>
<th><strong>Outputs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence, sub-topics</td>
<td>EBP intervention which is supported by the evidence in the Input column: Utilization of stroke education and behavioral modification education to lower overall risk of stroke in high risk women</td>
<td>The participants (subjects): Women enrolled in WISEWOMAN Site: Jordan Valley Health Center</td>
</tr>
<tr>
<td>Major Facilitators or Contributors</td>
<td>Major steps of the intervention</td>
<td>Major Barriers or Challenges</td>
</tr>
<tr>
<td>The WISEWOMAN program through the CDC at JVHC—education coordination by Jade Manczuk.</td>
<td>1. Assess the Need for Change in Practice 2. Locate the Best Evidence 3. Critically Analyze the Evidence 4. Design Practice Change 5. Implement and Evaluate</td>
<td>Low</td>
</tr>
</tbody>
</table>

#### EBP intervention which is supported by the evidence in the Input column:
- Utilization of stroke education and behavioral modification education to lower overall risk of stroke in high risk women

#### Major steps of the intervention:
1. Assess the Need for Change in Practice
2. Locate the Best Evidence
3. Critically Analyze the Evidence
4. Design Practice Change
5. Implement and Evaluate

#### Major Barriers or Challenges:
- Low

#### Major Facilitators or Contributors:
The WISEWOMAN program through the CDC at JVHC—education coordination by Jade Manczuk.

---

**Evidence, sub-topics**
- Risk factors for stroke:
  - Cardiovascular disease (Hyperlipidemia, Hypertension, Cardiac arrhythmias)
- Diabetes
- Obesity as
- Tobacco abuse
- Primary relative stroke history

**Statistical analysis to be used**
A bivariate analysis will be used to be able to look both at knowledge of stroke risks and at the behavioral modification attempts.
PICOTS: In adult female patients, ages 18-65, who are at high risk for stroke by having the following diagnoses; cardiovascular disease, hypertension, cardiac arrhythmias, hyperlipidemia, tobacco abuse, or women with significant primary relative family history of stroke, does behavioral modification education increase the knowledge of stroke risk and increase behavioral modification attempts within 3 months of receiving the education in the family practice setting? (Melnyk & Fineout-Overholt, 2015b; Terry, 2015)
Appendix K
Theory to Application Diagram

The Health Belief Model

Benefits Include: Reduce threat of CVA, reduce risk of other health problems or diseases, lose weight, gain control of co-morbid conditions, and support from others participating in the program

Barriers Include: feelings of obstacles in achieving and maintaining modifications, cost of modifications, inconvenience, fear of failure, and time-consuming

(“The Health Belief Model,” 2016)
Appendix L
Recruitment Script

Hello everyone, thank you for coming tonight for your educational session for WISEWOMAN. I am Tish Lewien a Nurse Practitioner student from UMKC. I am going to be providing education on strokes, or cerebrovascular accidents, and the behavioral modifications that can be done to lower your overall risk of stroke. In addition to this educational session, I am also working on a study to see if this educational session is effective. Would any of you be interested in helping me with my project by taking a quick pretest before the educational session and a quick posttest after the educational session. This study is not part of your care here at Jordan Valley or your participation in the WISEWOMN project. There is nothing in particular about this group, personally, that included you in the possibility of participating in this project. I am currently giving this opportunity to each woman involved in WISEWOMAN. Please be aware that all of you, regardless if you participate, will still be given credit for this session towards your four suggested WISEWOMAN educational meetings. Would any of you be willing to hear more details about this research study and my project to evaluate this educational session (Revised from Boston University Sample Script provided)?
Appendix M
PowerPoint Presentation
Cardiovascular Disease
- High Cholesterol
  - [https://www.youtube.com/watch?v=Kn0C66IA9QY](https://www.youtube.com/watch?v=Kn0C66IA9QY)
- A study of more than 90,000 patients showed that “the larger the reduction in LDL-C, the greater the reduction in stroke risk” (Furie et al., 2011, p. 6).
- More than 73.5 million Americans have high cholesterol.
- The USPSTF suggests lipid screenings and treatment with medication and lifestyle modifications.

Cardiovascular Disease
- Irregular Heart Beat or Atrial Fibrillation (A-Fib)
  - [https://www.youtube.com/watch?v=Vr1I1WYrths](https://www.youtube.com/watch?v=Vr1I1WYrths)
- Statistics show that if a person has been diagnosed with A-Fib, their CVA risk increases approximately 5x compared with a person who does not have A-Fib.
- If you have been diagnosed with A-Fib, there are many things that you and your doctor can do to prevent stroke.

Diabetes Mellitus
- Diabetes Mellitus (DM)
  - [https://www.youtube.com/watch?v=406x3ceuwy](https://www.youtube.com/watch?v=406x3ceuwy)
- More than 374 million people across the world have DM.
- Elevated glycated hemoglobin (HbA1C), which is an average measure of blood glucose over three months in patients with DM, has been shown to be a high CVA risk factor.
- Although the risk of CVA in patients with DM is universal regardless of age, the younger the patient is at diagnosis directly correlates with a higher risk of CVA.
Obesity

https://www.youtube.com/watch?v=5BlCuQ2Yn2L0

- Obesity is defined as a BMI over 30 and is also related to many CVA risk factors we have already discussed
- High Blood Pressure
- High Cholesterol
- Diabetes
- Overweight women (BMI 25-29) are 22% more likely to have a CVA
- Obese women (BMI 30-39) are 64% more likely to have a CVA

(Tobacco Abuse)

- Cigarette smoke, vapes, cigars, pipes, and chewing tobacco are all considered tobacco abuse
- https://www.youtube.com/watch?v=92b54Yl1tc

Tobacco Abuse

- More than five million people die from smoking-related deaths each year
- More than 6% of total deaths in women are directly related to smoking
- Smoking drastically increases the risk for CVA when combined with other risk factors such as heart disease, obesity, or DM
- CVA risk related to smoking can fall to the lowest level within five years of smoking cessation

(Choice is yours)

- $5 per pack each week
- $1,193 per year
- $18,290 per pack

Take Away Points:

- It is important to know your risks!
- What is your blood pressure?
- What is your cholesterol level?
- Have you or someone in your family had an irregular heart beat?
- Do you have diabetes?
- Are you obese?
- Do you still smoke?
- If you have these known risk factors, lifestyle modifications can help lower your overall CVA risk!

References

References


OTHER HEART DISEASE
People with coronary heart disease or heart failure have a higher risk of stroke than those with hearts that work normally. Dilated cardiomyopathy (an enlarged heart), heart valve disease and some types of congenital heart defects also raise the risk of stroke.

SICKLE CELL DISEASE
(ALSO CALLED SICKLE CELL ANEMIA)
The genetic disorder mainly affects African-American and Hispanic children. “Sickled” red blood cells are less able to carry oxygen to tissues and organs. These cells also tend to stick to blood vessel walls, which can block arteries to the brain and cause a stroke.

PERIPHERAL ARTERY DISEASE
is the narrowing of blood vessels carrying blood to leg and arm muscles. It's caused by fatty buildups of plaque in artery walls. People with peripheral artery disease have a higher risk of carotid artery disease, which raises their risk of stroke.

CAROTID OR OTHER ARTERY DISEASE
The carotid arteries in your neck supply blood to your brain. A carotid artery narrowed by fatty deposits from atherosclerosis may become blocked by a blood clot. Carotid artery disease is also called carotid artery stenosis.
“Every 40 seconds, someone suffers a stroke.
Yet, 80 percent of strokes are preventable. Though certain risk factors — including heredity, age and race — can’t be changed, several risk factors can be changed, treated or controlled.

Talk to your doctor about your stroke risk.

High Blood Pressure (HBP)
HBP is the No. 1 cause of stroke and the most important controllable risk factor for stroke. People who are overweight or obese, over age 35, have a family history of HBP, African-Americans, pregnant women, and those who are physically inactive, eat too much salt and/or drink too much alcohol are at higher risk for HBP.

Of all people with high blood pressure, more than 20 percent are unaware of their condition. Are you one of them? If you don’t know, see a healthcare professional to be tested.

How can you control your blood pressure?
• Eat a better diet, which may include reducing salt intake.
• Engage in regular physical activity.
• Maintain a healthy weight.
• Manage stress.
• Avoid tobacco smoke.
• Take your medication as prescribed.
• If you drink alcohol, limit your intake (no more than one drink per day for women and two drinks per day for men).

Cigarette Smoking
The nicotine and carbon monoxide in cigarette smoke damage the cardiovascular system in many ways. The use of oral contraceptives combined with cigarette smoking greatly increases stroke risk.

Diabetes Mellitus
Many people with diabetes also have high blood pressure, high blood cholesterol and are overweight. This increases their risk even more. Though diabetes is treatable, the presence of the disease still increases your risk of stroke.

Poor Diet
Diets high in saturated fat, trans fat and cholesterol can raise blood cholesterol levels. Diets high in sodium (salt) can contribute to increased blood pressure. Diets with excess calories can contribute to obesity. But a diet that includes five or more servings of fruits and vegetables per day may reduce stroke risk.

Physical Inactivity and Obesity
Being inactive, obese or both can increase your risk of high blood pressure, high blood cholesterol, diabetes, heart disease and stroke. So go on a brisk walk, take the stairs and do whatever you can to make your life more active. Try to get a total of at least 30 minutes of activity on most or all days.

High Blood Cholesterol
It also appears that low HDL ("good") cholesterol is a risk factor for stroke in men, but more data are needed to verify its effect in women.

Atrial Fibrillation
The heart’s upper chambers quiver instead of beating effectively, which can let the blood pool and clot. If a clot breaks off, enters the bloodstream and lodges in an artery leading to the brain, a stroke results.

("Stroke Patient Education Handouts," n.d.)
Women and Stroke

One in five women in the United States will have a stroke in her lifetime. Nearly 60% of stroke deaths are in women, and stroke kills twice as many women as breast cancer. Surprised? You’re not alone. Stroke is the third leading cause of death for women, yet most women do not know their risk of having a stroke.

These facts are alarming, but there is some good news: Up to 80% of strokes can be prevented. This means it is important to know your risk of having a stroke and to take action to reduce that risk.

What Is a Stroke?
A stroke, sometimes called a brain attack, occurs when blood flow to an area of the brain is cut off. When brain cells are starved of oxygen, they die. Stroke is a medical emergency. It’s important to get treatment as soon as possible. A delay in treatment increases the risk of permanent brain damage or death.

What Puts Women at Risk of Stroke?
- High blood pressure is a main risk factor for stroke, yet nearly one in three women with high blood pressure does not know she has it.
- Stroke risk increases with age, and women live longer than men. This is why 6 in 10 people who die from stroke are women. Also, the percentage of strokes in women aged 45 or younger is increasing. Younger women may have different symptoms of stroke, such as dizziness or headache, than women age 46 and older do.
- Women have some unique risk factors for stroke. Having high blood pressure during pregnancy raises a woman’s risk for stroke.
- Certain types of birth control medications may raise stroke risk in women with high blood pressure, especially if they smoke.
- Women are twice as likely as men to experience depression and anxiety, and women often report higher stress levels than men do. These mental health issues all raise a person’s risk for stroke.

Not all women are equally affected by stroke. African-American women are nearly twice as likely to have a stroke as white women, mainly because of having high blood pressure, being overweight, and having diabetes.
How Can I Prevent Stroke?
Most strokes can be prevented by keeping medical conditions under control and making lifestyle changes. A good place to start is to know your ABCs of heart health:

A: Aspirin: Aspirin may help reduce your risk for stroke. But you should check with your doctor before taking aspirin because it can make some types of stroke worse. Before taking aspirin, talk with your doctor about whether aspirin is right for you.

B: Blood Pressure: Control your blood pressure.

C: Cholesterol: Manage your cholesterol.

S: Smoking: Quit smoking or don’t start.

Make lifestyle changes:

- **Eat healthy and stay active.** Choose healthy foods most of the time, including foods with less salt, or sodium, to lower your blood pressure, and get regular exercise. Being overweight or obese raises your risk of stroke.
- **Talk to your doctor about your chances of having a stroke,** including your age and whether anyone in your family has had a stroke.
- **Get other health conditions under control,** such as diabetes or heart disease.

What Is CDC Doing About Stroke?
CDC and its partners are leading national initiatives and programs to reduce the death and disability caused by stroke and to help women live longer, healthier lives.

- CDC’s Division for Heart Disease and Stroke Prevention (DHDSP) provides resources to all 50 states to address heart disease and stroke.
- DHDSP supports the WISEWOMAN program that provides low-income, under-insured or uninsured women with chronic disease risk factor screening, lifestyle programs, and referral services in an effort to prevent heart disease and strokes.
- The Paul Coverdell National Acute Stroke Program funds states to measure, track, and improve the quality of care for stroke patients. The program works to reduce death and disabilities from stroke.
- The Million Hearts® initiative, which is co-led by CDC and the Centers for Medicare & Medicaid Services, works with other federal agencies and private sector partners to raise awareness about stroke prevention. Million Hearts® aims to prevent 1 million heart attacks and strokes by 2017.

Learn more by visiting www.cdc.gov/stroke

(“Stroke Patient Education Handouts,” n.d.)
Appendix Q
Patient Recruitment Flyer

Are You At Risk?

Please join us for a conversation about stroke risk in women and changes you can make NOW to prevent a stroke

November 30, 2016
1:00-3:00 PM
Jordan Valley WIC Classroom
Snacks and Beverages Provided

Discussion facilitated by UMKC BSN-DNP Student
Research Survey to be completed after discussion
Participation in survey not required to attend

Please contact Tish Lewien @ 417-839-2208 for more information
Appendix R
Statistical Analysis

Stroke Knowledge Test

Hypothesis Test Summary

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Test</th>
<th>Sig.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>The median of differences between SKT Pretest Quantity and SKT Posttest Quantity equals 0.</td>
<td>Related-Samples Wilcoxon Signed Rank Test</td>
<td>.005</td>
<td>Reject the null hypothesis.</td>
</tr>
</tbody>
</table>

Asymptotic significances are displayed. The significance level is .05.

Exercise

<table>
<thead>
<tr>
<th>Test Statistics&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Post-Test Exercise Susceptibility - Pre-Test Exercise Susceptibility</th>
<th>Post-Test Exercise General Intention - Pre-Test Exercise General Intention</th>
<th>Post-Test Exercise 6 month Intention - Pre-Test Exercise 6 month Intention</th>
<th>Post Test Exercise Benefits - Pre Test Exercise Benefits</th>
<th>Post Test Exercise Barriers - Pre Test Exercise Barriers</th>
<th>Post Test Exercise Ease - Pre Test Exercise Ease</th>
<th>Post Test Exercise Subjective Norm - Pre Test Exercise Subjective Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>-1.693&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-4.47&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-1.633&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-1.96&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-0.85&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-3.33&lt;sup&gt;e&lt;/sup&gt;</td>
<td>-1.089&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.090</td>
<td>.055</td>
<td>.102</td>
<td>.072</td>
<td>.393</td>
<td>.739</td>
<td>.276</td>
</tr>
</tbody>
</table>

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.
c. Based on positive ranks.
# Hyperlipidemia

<table>
<thead>
<tr>
<th>Test Statistics&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Post-Test Lipids Susceptibility - Pre-Test Lipids Susceptibility</th>
<th>Post-Test Lipids General Intention - Pre-Test Lipids General Intention</th>
<th>Post-Test Lipids 6 month Intention - Pre-Test Lipids 6 month Intention</th>
<th>Post-Test Lipids Benefits - Pre Test Lipids Benefits</th>
<th>Post-Test Barriers - Pre Test Barriers</th>
<th>Post-Test Ease - Pre Test Ease</th>
<th>Post-Test Lipids Subjective Norm - Pre Test Lipids Subjective Norm</th>
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<tbody>
<tr>
<td>Z</td>
<td>-.016&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-1.000&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.000&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-1.000&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.000&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.000&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-1.342&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.414</td>
<td>.317</td>
<td>1.000</td>
<td>.317</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
</tbody>
</table>

<sup>a</sup> Wilcoxon Signed Ranks Test  
<sup>b</sup> Based on negative ranks  
<sup>c</sup> The sum of negative ranks equals the sum of positive ranks.

### Overweight/Obesity

<table>
<thead>
<tr>
<th>Test Statistics&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Post-Test Overweight Susceptibility - Pre-Test Overweight Susceptibility</th>
<th>Post-Test Overweight General Intention - Pre-Test Overweight General Intention</th>
<th>Post-Test Overweight 6 month Intention - Pre-Test Overweight 6 month Intention</th>
<th>Post-Test Overweight Benefits - Pre Test Overweight Benefits</th>
<th>Post-Test Overweight Barriers - Pre Test Overweight Barriers</th>
<th>Post-Test Overweight Ease - Pre Test Overweight Ease</th>
<th>Post-Test Overweight Subjective Norm - Pre Test Overweight Subjective Norm</th>
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<tbody>
<tr>
<td>Z</td>
<td>-.968&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-1.000&lt;sup&gt;e&lt;/sup&gt;</td>
<td>-1.000&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.378&lt;sup&gt;e&lt;/sup&gt;</td>
<td>-.1214&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.1342&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.447&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.334</td>
<td>.317</td>
<td>.317</td>
<td>.705</td>
<td>.225</td>
<td>.180</td>
<td>.655</td>
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</table>

<sup>a</sup> Wilcoxon Signed Ranks Test  
<sup>b</sup> Based on negative ranks  
<sup>c</sup> Based on positive ranks.
## Alcohol

<table>
<thead>
<tr>
<th>Test Statistics(^b)</th>
<th>Post-Test Alcohol Susceptibility - Pre-Test Alcohol Susceptibility</th>
<th>Post-Test Alcohol General Intention - Pre-Test Alcohol General Intention</th>
<th>Post-Test Alcohol 6 month Intention - Pre-Test Alcohol 6 month Intention</th>
<th>Post Test Alcohol Benefits - Pre Test Alcohol Benefits</th>
<th>Post Test Alcohol Barriers - Pre Test Alcohol Barriers</th>
<th>Post Test Alcohol Ease - Pre Test Alcohol Ease</th>
<th>Post Test Alcohol Subjective Norm - Pre Test Alcohol Subjective Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>-1.732(^b)</td>
<td>-.368(^b)</td>
<td>-1.342(^b)</td>
<td>-1.633(^a)</td>
<td>-1.095(^a)</td>
<td>-1.342(^b)</td>
<td>-1.414(^b)</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.083</td>
<td>.713</td>
<td>.190</td>
<td>.102</td>
<td>.273</td>
<td>.190</td>
<td>.157</td>
</tr>
</tbody>
</table>

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.
c. Based on positive ranks.
Appendix S
IRB Approval Documentation

IRB Approval Letter

UMKC
Office of Research Services

NOTICE OF NEW APPROVAL

Principal Investigator: Nancy Willis-Smith
379 SW 12th Lane
Minnemah, MO 64769

Protocol Number: 16-305
Protocol Title: Cerebrovascular Accident Education and Behavioral Modifications for Women at High Risk
Type of Review: Designated Review

Date of Approval: 09/06/2016
Date of Expiration: 09/22/2017

Dear Dr. Willis-Smith,

The above referenced study, and your participation as a principal investigator, was reviewed and approved by the UMKC IRB. You are granted permission to conduct your study as described in your application.

Your protocol was approved under Expedited Review Regulatory Criteria at 45 CFR 46.110 or 21 CFR 56.110 under Category #7 as follows:
7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

This approval includes the following documents:
Attachments

The ability to conduct this study will expire on or before 09/22/2017 unless a request for continuing review is received and approved. If you intend to continue conduct of this study, it is your responsibility to provide a Continuing Review Form prior to the expiration of approval.

This approval is issued under the University of Missouri - Kansas City's Federal Wide Assurance FWA00005427 with the Office for Human Research Protections (OHRP). If you have any questions regarding your obligations under the Board's Assurance, please do not hesitate to contact us.

There are 5 stipulations of approval:
1) No subjects may be involved in any study procedure prior to the IRB approval date or after the expiration date. (PIs and sponsors are responsible for initiating Continuing Review proceedings).
2) All untimelimited or serious adverse events must be reported to the IRB.
3) All protocol modifications must be IRB approved prior to implementation unless they are intended to reduce risk. This includes any change of investigator.
4) All protocol deviations must be reported to the IRB.
5) All recruitment materials and methods must be approved by the IRB prior to being used.

Please contact the Research Compliance Office (email: umkcirb@umkc.edu, phone: (816)235-5927) if you have questions or require further information.

Thank you,

Cynthia Thompson
UMKC IRB
Appendix T
IRB Approved Consent

Consent for Participation in a Research Study
Cerebrovascular Accident Education and Behavioral Modifications for
Women at High Risk

Tish Lewien RN, BSN
UMKC BSN-DNP Class of 2017

Request to Participate

You are being asked to take part in a research study. This study is being conducted at Jordan Valley Community Health Center.

The researcher in charge of this study is Dr. Willis-Smith. While the study will be run by her, other qualified persons including Tish Lewien, who work with her may act for her.

The study team is asking you to take part in this research study because you have been enrolled in WISEWOMAN and have been diagnosed with hypertension, hyperlipidemia, cardiac arrhythmias, diabetes mellitus, obesity, and/or tobacco abuse. Research studies only include people who choose to take part. This document is called a consent form. Please read this consent form carefully and take your time making your decision. The researcher or study staff will go over this consent form with you. Ask them to explain anything that you do not understand. This consent form explains what to expect: the risks, discomforts, and benefits, if any, if you consent to be in the study.

Background

You have been asked to participate in this study because of you are currently involved in WISEWOMAN program and your current health diagnosis such as hypertension, hyperlipidemia, cardiac arrhythmias, diabetes mellitus, obesity, and/or tobacco abuse that place you at higher risk of Cerebrovascular Accidents.

You will be one of about 30 subjects in the study at Jordan Valley Community Health Center.

Purpose

The purpose of this project is to see if a community education presentation influences knowledge of CVAs. The American Heart Association emphasizes the importance of awareness and to provide a more rigorous education to women at younger ages because of women’s’ increased risk of stroke with age; the onset of stroke risk factors such as obesity, hypertension, and diabetes mellitus, which occur at younger ages.

Procedures
If you agree to take part in this study, you will take short questionnaire before participating in an educational session that will last about 45 minutes. A question and answer session will be offered at the end of class. After the educational session you will complete another short questionnaire. Your total participation time will last about 1 hour.

When you are done taking part in this study, you will still have access to the educational PowerPoint and educational brochures that were included in the educational session.

Participation in this study is voluntary, that you may refuse to participate in the pre and posttest activities if you wish. Simply inform the student investigator, Tish Lewien, at any time you feel that you no longer or do not want to participate in this study.

**Risks and Inconveniences**

Potential risks involved in this study could include; stress or anxiety related to the educational session or providing the necessary information to complete the pre or post test surveys. Another risk is the potential loss of confidentiality. Measures have been taken to reduce this risk; you will know your confidential numerical code and there is no way to tie back your health care information on the surveys. The information provide will not be released to your health care provider or anyone else involved in your health care. Tish Lewien, the student investigator, and Jade Manczuk, the WISEWOMAN coordinator, are the only individuals with access to the statistical information, however Tish Lewien is the only individual that will have direct access to the answers you provide today on the surveys.

This research is considered to be minimal risk. That means that the risks of taking part in this research study are not expected to be more than the risks in your daily life. There are no other known risks to you if you choose to take part in this study.

**Benefits**

You may not receive any direct benefit by participating in this study. We hope that you knowledge about CVA does increase and that you will understand the benefits of lifestyle modifications and changes that can reduce your overall risk for CVA now and in the future.

Indirect benefits to society could potentially include a new educational class that could be used in all WISEWOMAN groups, health care organizations, and in general health care education to allow women to lower their overall risk of CVA.

**Fees and Expenses**

There are no monetary fees or expenses associated with this study. Drinks, snacks, and educational material are all provided for you during this study and are free of charge.

**Compensation**

There will be no direct compensation involved in this project.
Alternatives to Study Participation

The alternative is not to take part in the study.

Confidentiality

While we will do our best to keep the information you share with us confidential, it cannot be absolutely guaranteed. Individuals from the University of Missouri-Kansas City Institutional Review Board (a committee that reviews and approves research studies), Research Protections Program, and Federal regulatory agencies may look at records related to this study to make sure we are doing proper, safe research and protecting human subjects. The results of this research may be published or presented to others. You will not be named in any reports of the results.

Only using an identifiable code known only to the participants, as the only identifier on the survey forms will protect your privacy and confidentiality. The information from this study will be stored on a password-protected computer owned by the student investigator and no visual, audio, or direct quotes will be obtained during this study. Once statistical analysis is completed, by January 20, 2017, the protected information will be destroyed and erased.

In Case of Injury

The University of Missouri-Kansas City appreciates people who help it gain knowledge by being in research studies. It is not the University’s policy to pay for or provide medical treatment for persons who are in studies. If you think you have been harmed because you were in this study, please call the researcher, Dr. Willis-Smith at 417-529-2080.

Contacts for Questions about the Study

You should contact the Office of UMKC’s Institutional Review Board at 816-235-5927 if you have any questions, concerns or complaints about your rights as a research subject. You may call the researcher Tish Lewien at 417-839-2208 if you have any questions about this study. You may also call her if any problems come up.

Voluntary Participation

Taking part in this research study is voluntary. If you choose to be in the study, you are free to stop participating at any time and for any reason. If you choose not to be in the study or decide to stop participating, your decision will not affect any care or benefits you are entitled to. They may do this for medical or administrative reasons or if you no longer meet the study criteria.

You have read this Consent Form or it has been read to you. You have been told why this research is being done and what will happen if you take part in the study, including the risks and benefits. You have had the chance to ask questions, and you may ask questions at any time in the future by calling Dr. Willis-Smith at 417-529-2080. By signing this consent form, you volunteer and consent to take part in this research study. Study staff will give you a copy of this consent form.
Signature (Volunteer Subject)  Date

Printed Name (Volunteer Subject)

Signature of Person Obtaining Consent  Date

Printed Name of Person Obtaining Consent
Appendix U
Permission to Use Name and Site

JORDAN VALLEY
COMMUNITY HEALTH CENTER

440 E Tampa St.
Springfield, MO 65806

04/24/2017

To Whom it May Concern:

It has been approved for Patricia Lewien to include, in her final research paper, Jordan Valley Community Health Center as her site of completion and to include my name as the site contact.

Sincerely,

Jade Manczuk, RD, LD
Registered Dietitian
WISEWOMAN Manager/Coordinator
Appendix V
UMKC School of Nursing and Health Science Approval Letter

July 24, 2016

Members of UMKC Institutional Review Board
University of Missouri-Kansas City
Kansas City, MO 64108

UMKC IRB,

This letter serves to provide documentation regarding Patricia Lewien’s Doctor of Nursing Practice (DNP) Project proposal. Ms. Lewien obtained approval for her project proposal, Cerebrovascular Accident Behavioral Modification Education for High Risk Women, from the School of Nursing DNP faculty committee on July 24, 2016.

If I can provide any further information, please feel free to contact me.

Sincerely,

Susan J. Kimble, DNP, RN, ANP-BC, FAANP
Clinical Associate Professor
DNP Programs Director
UMKC School of Nursing and Health Studies
816-235-5962
kimbles@umkc.edu