

DARE TO BE AWARE: EXAMINING STROKE RISK PERCEPTION IN AFRICAN
AMERICAN WOMEN AGED 35-54 IN RURAL ARKANSAS

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BY

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DEDICATION

I dedicate this dissertation to my family. To my parents, Roger and Gertie Toney. Mom and Dad, I did it! Thank you for being such a source of love, encouragement, and support throughout this dissertation process. Dad, thank you for reminding me of the importance of finishing whatever I start. I hope I have made you and mom proud.

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ABSTRACT

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DARE TO BE AWARE: EXAMINING STROKE RISK PERCEPTION IN AFRICAN AMERICAN WOMEN AGED 35-54 IN RURAL ARKANSAS

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Stroke is a leading cause of chronic disability, second leading cause of dementia, and fifth leading cause of death in the US. *Healthy People 2030* established a goal to improve cardiovascular health and reduce deaths from heart disease and stroke by raising awareness of stroke signs and symptoms and decreasing risk factor prevalence. African American women are at higher risk for stroke at a younger age compared to white women, with women in the 35-54 age group having a three-fold increase in stroke risk. Stroke susceptibility is compounded in rural African American women due to higher stroke risk factor prevalence and insufficient access to preventive resources. More research is needed to investigate the rural African American female experience with risk perception of stroke in women aged 35-54. The purpose of this quantitative study was to explore the relationship among self-identified stroke risk factors, stroke risk perception, and the likelihood of risk reduction behaviors among African American women aged 35-54 residing in rural Arkansas.

All participants ($n = 152$) in this study completed the Cerebrovascular Attitudes and Beliefs Scale-Revised (CABS-R) self-report survey instrument to assess stroke risk factors and stroke risk perception. The CABS-R data were used to explore whether (a)

family history of stroke affects risk perception, (b) there is an association between personal stroke risk factors and risk perception, and (c) whether 6-month intention to change risk factors is predictive of perceived threat of stroke. Results of independent samples *t*-tests indicated that there were no significant differences in perceived stroke susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction between those with and without family histories of stroke. However, notable effect sizes were identified for perceived susceptibility to stroke among participants with diabetes (-.47), perceived susceptibility to stroke regarding lack of medication adherence (.76), and perceived barriers to stroke risk factor reduction regarding lack of medication adherence (-.74). Pearson's correlation revealed there was no statistically significant relationship between the number of self-identified stroke risk factors and perceived stroke severity ($r = .07, p = .421$). Further, results of the standard multiple linear regression indicated that the model containing inadequate exercise, overweight, and high blood pressure did not significantly predict perceived stroke severity, $F(3, 41) = .07, p = .976, R^2 < .01$.

This study found inconsistencies in the ability to accurately identify personal stroke risk factors and align risk factor prevalence with threat perception among rural African American women aged 35-54. Interventions for decreasing stroke morbidity and mortality from this study should focus on increasing risk factor knowledge, awareness, and accuracy of risk factor identification among rural African American women, particularly those at risk for stroke due to family history, high blood pressure, obesity, and inadequate physical activity.

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CHAPTER I

INTRODUCTION

Stroke or “brain attack” is a formidable health issue that has ravaged the health of millions nationally and worldwide. An estimated 795,000 Americans each year suffer a stroke, and approximately 610,000 are new strokes (Centers for Disease Control and Prevention [CDC], 2020a). Among those who experience a stroke each year, approximately 133,000, or 1 in 19, will die (United Health Foundation, 2019). Additionally, someone in the United States experiences a stroke every 40 s; and someone dies as a result of a stroke every 4 min (CDC, 2017a). Furthermore, approximately 40% of initial stroke survivors will experience a second stroke within 5 years of the first, and 23% of stroke survivors will experience a second stroke within one year of the first (Johns Hopkins Medicine, 2020).

The physical, emotional, and societal toll of stroke is evidenced by the fact that stroke is the leading cause of chronic disability, second leading cause of dementia, and fifth leading cause of death in the United States (CDC, 2017a). *Healthy People 2030* identifies stroke as a prominent health threat and established a goal to decrease deaths from cardiovascular disease by improving cardiovascular health through greater prevention, detection, and treatment of risk factors for heart attack and stroke. More specifically, one of the *Healthy People 2030* objectives is to reduce stroke deaths from 37.0 deaths per 100,000 people to 33.4 deaths per 100,000 (U.S. Department of Health

and Human Services, Office of Disease Prevention and Health Promotion [USDHHS-ODPHP], n.d.a).

Research has established that younger, minority females are not well-informed about stroke and stroke risk in general, which decreases the likelihood of risk reduction behavior (Aycock & Clark, 2016; Christian et al., 2007; Ferris et al., 2005; Moore et al., 2010). Lack of information regarding the level of perceived risk of potential stroke occurrence among young and early middle-age African American women is added cause for concern considering the elevated stroke risk that exists in this population (Ford et al., 2009; Graham et al., 2006; Sadler et al., 2005). Despite an increased prevalence of stroke risk factors, African American women often underestimate their vulnerability to a health event and perceive their risk of stroke and other negative health occurrences as being similar to or lower than other women their age (Graham et al., 2006). This issue mimics the common theme regarding how individuals and groups who are at greatest risk of developing or experiencing a major health event often have the lowest perceived risk of a potential health occurrence (Aycock et al., 2015; Ferris et al., 2005; Ford et al., 2009; Graham et al., 2006; Moore et al., 2010).

Disproportionate rates of stroke prevalence and associated poor health outcomes among African Americans represent a long-standing trend in the United States. Of the 55 million annual deaths worldwide, an estimated 10% are due to stroke. Among African Americans, strokes tend to occur earlier in life, they are more severe in nature, and are twice as likely to cause death when compared to strokes in whites (CDC, 2019a; Liebson, 2010; Ovbiagele & Nguyen-Huynh, 2011; Trimble & Morgenstern, 2008). African

American women have a greater likelihood of stroke than any other group of women in the nation (CDC, n.d.a), with young and middle-aged African American women aged 35-54 having four times the relative risk for stroke (American Heart Association, 2014). This increased relative risk is associated with the fact that nearly 49% of African American women 20 years of age and older have notable cardiac risk factors (Black Women's Health Imperative, 2018). African American women have an elevated number of modifiable risk factors, such as hypertension, diabetes, high blood cholesterol, and obesity (CDC, 2019b). In addition, recent research indicates there is a transitional midlife stroke surge in women, which combined with low perceived stroke health threat in this priority population (Ford et al., 2009; Sadler et al., 2005; Strimike, 2010; Trimble & Morgenstern, 2008), further exacerbates the health crisis in this population.

Stroke is so prevalent in the United States that the Heart Attack and Stroke Prevention Center (2019) has designated the following 11-state southeast region as the *Stroke Belt*: Alabama, Arkansas, Georgia, Indiana, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. Within the Stroke Belt, the risk of experiencing a stroke is an estimated 34% higher than in other areas of the country. African American women who reside in the Stroke Belt states experience cardiovascular events such as stroke in a greater proportion than the African American population as a whole. This is associated with the fact that such areas are generally low-income, medically underserved regions that provide "limited opportunities to gain health information" (Appel et al., 2005, p. 316). Perceived barriers to disease prevention in African American women residing in rural southern locales include low socioeconomic

status, healthcare facility accessibility, transportation issues, cost of healthcare, and lack of health insurance (Appel et al, 2005; Ford et al., 2009). Such factors make the study of stroke morbidity and mortality among African American women aged 35-54 a priority area for investigation and intervention.

Researchers assert that 80% of strokes can be prevented with the reduction or elimination of modifiable risk factors (American Heart Association, 2019; Howard et al., 2011; Ovbiagele & Nguyen-Huynh, 2011). Yet, limited research currently exists that investigates the African American female experience with risk perception of stroke. Increased emphasis on the assessment of stroke risk perception in those at elevated risk for stroke holds great potential for counteracting the magnitude of stroke morbidity and mortality in vulnerable populations such as rural African American women. Therefore, there is a need for further research to examine how African American women perceive their individual stroke risk factors to improve prevention efforts for this population.

Purpose of the Study

The purpose of this quantitative study was to explore the relationship between self-identified stroke risk factors, stroke risk perception, and the likelihood of risk reduction behaviors among African American women aged 35-54 residing in rural Arkansas.

Research Questions

The research questions that guide this study were:

1. Is there a difference in rural Arkansas middle-aged African American women with a family history of stroke compared to those without a family history of

stroke regarding perceived stroke susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction?

2. Are the number of personal stroke risk factors in rural Arkansas middle-aged African American women (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) related to their perceived stroke severity?
3. Does six-month intention to change a set of personal stroke risk factors (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) predict perceived stroke severity among middle-aged African American women residing in rural Arkansas?

Hypotheses

The following null hypotheses were tested at the 0.05% level of significance:

1. There will be no statistically significant difference in rural Arkansas middle-aged African American women with a family history of stroke compared to those without a family history of stroke regarding perceived stroke susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction.
2. There will be no statistically significant relationship between the number of personal stroke risk factors in rural Arkansas middle-aged African American women (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) and their perceived stroke severity.

3. Six-month intention to change a set of personal stroke risk factors (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) will not significantly predict perceived stroke severity among middle-aged African American women residing in rural Arkansas.

Delimitations

The delimitations for this study were:

1. Study participants were comprised of African American females aged 35-54.
2. Participants had at least one personally identifiable stroke risk factor.
3. Participants were selected from Phillips County (located in rural Arkansas), which has one of the highest stroke mortality rates in the state.

Limitations

The limitations for this study were:

1. The study specifically targeted stroke risk and risk perception in middle-aged African American women residing in rural Arkansas, so results may not be generalizable to women who do not meet the eligibility criteria.
2. Recruiting women solely from a rural Arkansas county with high stroke mortality may not have yielded a sample that is representative of all rural counties; and ability to generalize results to non-rural settings may be limited.
3. Length of the survey instrument may have led some participants to discontinue the survey or abstain from answering some survey items.

Assumptions

In the interest of yielding the most accurate study results, certain aspects were assumed to be true and accurate. The assumptions for this study were:

1. Participants were able to understand the wording of each survey question and answer truthfully and to the best of their ability.
2. Individuals designated to administer the survey instrument understood the questionnaire content and were able to assist study participants in completing the questionnaire if needed.
3. Participants correctly identified their personal stroke risk factors.

Definition of Terms

Stroke – “brain attack” that occurs when a blood clot blocks an artery or a blood vessel breaks, interrupting blood flow to an area of the brain (CDC, 2020b).

Ischemic stroke – occurs as a result of an obstruction or blockage of a blood vessel in the brain due to fatty deposits or blood clot. It accounts for 87% of all strokes (American Stroke Association, 2018).

Hemorrhagic stroke – occurs when a weakened blood vessel ruptures in the brain. Responsible for 13% of all strokes (American Stroke Association, 2018).

Transient ischemic attack (TIA) – a “mini stroke” caused by a temporary clot. Symptoms usually resolve within 24 hours; otherwise, it is classified as an ischemic stroke (American Stroke Association, 2018).

Hemiplegia – partial or total paralysis on one side of the body (National Institute of Neurological Disorders and Stroke, 2014).

Hemiparesis – weakness on one side of the body, which affects 80% of stroke survivors (American Stroke Association, 2019a).

Personal stroke risk – risk for stroke based on the number of stroke risk factors an individual possesses.

Risk perception – one's personal thoughts about disease and the likelihood of experiencing a health event.

Perceived susceptibility – personal beliefs about the likelihood of contracting or developing a disease or condition.

Perceived severity – personal beliefs about the seriousness and consequences of contracting or developing a disease or condition.

Perceived threat – result of the combination of personal beliefs about susceptibility and severity of contracting or developing a disease or condition.

Perceived benefits – personal beliefs about advantages of taking action to prevent or reduce the risk of contracting or developing a disease or condition.

Perceived barriers – personal beliefs about obstacles or negative consequences of taking action to prevent or reduce the risk of contracting or developing a disease or condition.

Cues to action – internal or external triggers that influence or instigate behavioral activity to prevent or reduce disease risk.

Self-efficacy – personal belief that a recommended health behavior change can be successfully executed.

Importance of the Study

African American women are in a precarious position regarding the toll that a stroke takes on their health and wellness as well as their overall quality of life. The emerging trend of greater stroke prevalence in younger and middle-aged women is concerning and significantly increases the urgent need to curtail this significant public health issue. Despite a documented overall decline in vascular risk and stroke mortality in the 20th century, this trend has not been reflected in the African American female population (Beal, 2014). Research and interventions that bridge the gap between perceived versus actual stroke risk in African American females are crucial for combating the recent stroke surge and reducing overall stroke morbidity and mortality within this population. This study provides insight regarding risk awareness and the perceived importance of risk reduction among this high-risk population. Subsequently, the information gained from this study can be used to plan, implement, and evaluate health communication campaigns and health education/promotion interventions aimed at increasing risk awareness and decreasing risk factor prevalence among young and middle-aged African American women.

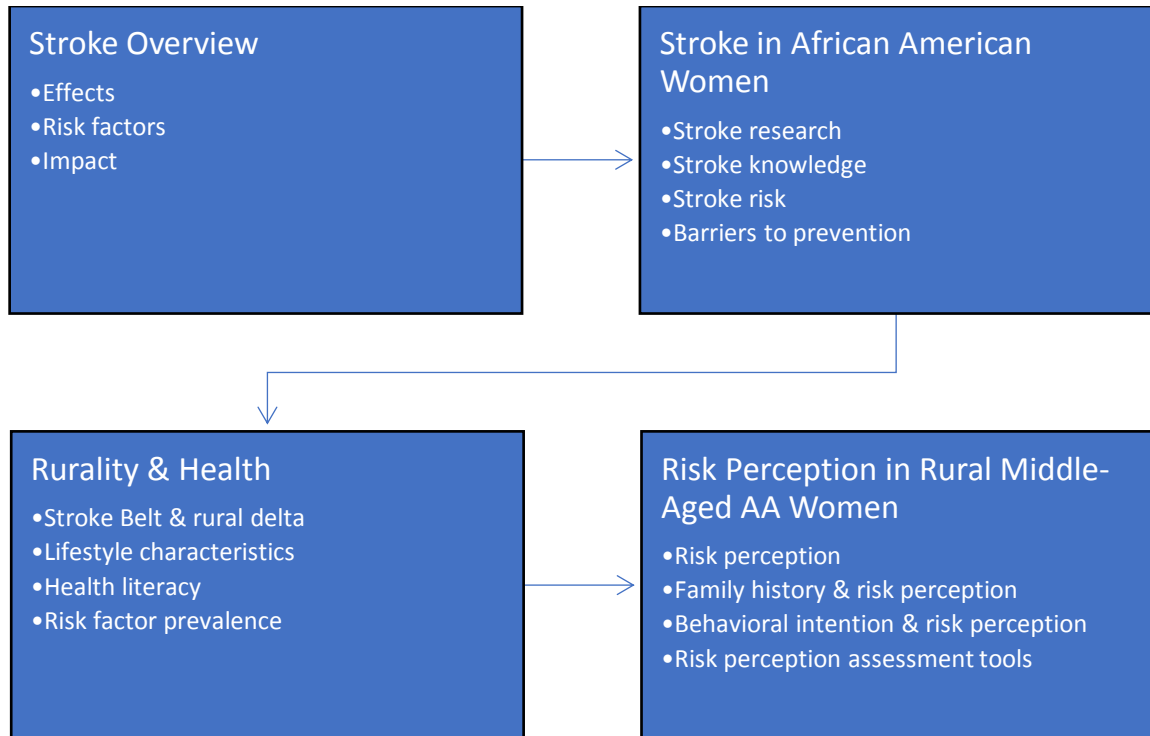
CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this chapter is to investigate the literature regarding stroke risk among rural middle-aged African American women in the United States. Specific areas of exploration will pertain to the impact of stroke, the interrelationship between geographic location and stroke risk, and stroke risk perception and health among at-risk rural African American women. The review provides an overview of stroke, its effects, risk factors, and impact. This review explores stroke in African American women, including stroke research, differences in stroke knowledge and risk, as well as barriers to stroke prevention. The relationship between rurality and health is examined. Further, the review narrows further to specifically examine stroke risk perception as it relates to risk factor prevalence, family history, and behavioral intention. Databases that were used for this literature review include Academic Search Complete, CINAHL, Medline with Full Text, ProQuest, PubMed, ScienceDirect, and Wiley Online Library. Figure 1 provides a representation of the literature review progression.

Figure 1

Visual Representation of Literature Review



Notable Stroke Statistics

Stroke is a health issue that continues to ravage the health of millions nationally and worldwide. It is a sudden and potentially devastating health event with the power to cause a lifelong decrease in quality of life. *Healthy People 2030* identifies heart disease and stroke as key health topics that needs to be addressed to decrease morbidity and mortality rates in the United States (USDHHS-ODPHP, n.d.a). Approximately 800,000 Americans each year suffer a new or recurrent stroke; an average of one stroke every 40 s or one every 3 to 4 min (CDC, 2017a). Of the 55 million annual deaths worldwide, an

estimated 11% are due to stroke (World Health Organization [WHO], 2020), which translates to 150,000 deaths per year in the United States alone (Virani et al., 2021). Additionally, nearly 40% of initial stroke survivors will experience a second stroke within 5 years (Johns Hopkins Medicine, 2020). The physical, emotional, and societal toll of a stroke is evidenced by the fact that a stroke is the leading cause of chronic adult disability, second leading cause of dementia, and a leading cause of death in the United States (CDC, 2017a; Gutierrez & Williams, 2014; Ovbiagele & Nguyen-Huynh, 2011).

Annually, an estimated 55,000 more strokes occur in women versus men. It is well-documented in the literature that strokes vary by race and ethnicity. Specifically, African Americans are more highly impacted by stroke than any other racial group within the United States (CDC, 2017a). African Americans have more than four times the risk of stroke in their 30s and 5.6 times the risk at age 40 (American Heart Association, 2021), and they are twice as likely to die from stroke as whites (CDC, 2017a; Howard et al., 2011; Liebson, 2010). Young and middle-aged African American females are among those at greatest risk for stroke morbidity and mortality. Risk factors such as age, family history, and ethnicity contribute to stroke occurrence. Modifiable risk factors such as hypertension, high cholesterol, diabetes, smoking, alcohol intake, obesity, and physical inactivity increase stroke risk (Andersen et al., 2009; Braun et al., 2016; Hankey, 2006). In light of such alarming facts, disparities in rates of stroke prevalence and associated health outcomes has been a driving force behind the most cutting-edge stroke research.

What is a Stroke?

Categorized as a major neurologic event, a stroke results from compromised blood flow to the brain that deprives the brain tissue of necessary oxygen and nutrients and results in immediate death of the affected brain cells (CDC, 2020b). A stroke is accompanied by marked signs and symptoms. Primary symptoms include a sudden headache that tends to be severe in nature, muscle weakness or numbness on one side of the body, visual disturbances, confusion, dizziness, difficulty speaking, and difficulty understanding speech (Jones et al., 2010; Mayo Clinic, 2018). Strokes are classified according to two primary types: ischemic and hemorrhagic. An ischemic stroke occurs as the result of an occlusion or blockage of a blood vessel in the brain, while a hemorrhagic stroke is the result of a ruptured blood vessel (American Stroke Association, 2018). The proper management of a stroke hinges on early and proper identification of the type of stroke experienced (Andersen et al., 2009; Fisher, 2008; O'Donnell et al., 2010).

Ischemic Stroke and TIA Effects

The magnitude and residual effects of stroke are heavily associated with the type of stroke experienced. Stroke severity and mortality differ significantly between ischemic and hemorrhagic strokes. According to the American Stroke Association (2018), an estimated 87% of strokes are ischemic and 13% are hemorrhagic; moreover, 10-15% of all strokes occur in people less than 45-49 years of age (Smajlović, 2015). Even before the occurrence of an ischemic stroke, many people will experience a precluding event known as a TIA. Symptoms of a TIA often resolve within 1 h, but all will typically do so within 24 h; otherwise, it is classified as an ischemic stroke. Due to the fleeting nature of

TIA symptoms, they often go undiagnosed and untreated (Fisher, 2008; Ovbiagele & Nguyen-Huynh, 2011). The possibility of severe consequences associated with TIA are reflected in the American Stroke Association's (2019b) report that one-third of people who experience a TIA will have a more severe stroke within a year, while an estimated 25% of people who have a TIA will die within 1 year.

Hemorrhagic Stroke Effects

Hemorrhagic strokes have a higher mortality rate than ischemic stroke (Andersen et al., 2009; Fisher, 2008; Krishnamurthi et al., 2015; O'Donnell et al., 2010).

Uncontrolled high blood pressure is the most frequent cause of hemorrhagic stroke (American Stroke Association, 2020). Overall, 8-17% of individuals who experience ischemic stroke, and 37-38% of hemorrhagic stroke sufferers will die within 30 days of the event.

Stroke Risk Factors and Impact

Numerous risk factors contribute to the likelihood of a stroke occurrence.

Prominent risk factors are classified as non-modifiable (cannot be changed or controlled) or modifiable (can be changed or controlled). Gender, race/ethnicity, and family history are notable non-modifiable risk factors; although these risk factors cannot be changed, they are significant in terms of overall risk for stroke (American Stroke Association, 2019d). Additionally, the uncontrollable nature of non-modifiable risk factors makes it even more crucial for at-risk individuals to try to decrease stroke risk by identifying and reducing modifiable risk factors they may possess.

Modifiable risk factors include hypertension, diabetes, obesity, poor diet, elevated cholesterol levels, cigarette smoking, high alcohol intake, and physical inactivity (American Stroke Association, 2019e). Hemorrhagic strokes are strongly correlated with high blood pressure, alcohol intake, and smoking behavior (Andersen et al., 2009; Larsson et al., 2016), while ischemic strokes are heavily linked to high blood pressure, diabetes, atrial fibrillation, and obesity (Andersen et al., 2009; Hankey, 2006). Efforts to manage modifiable risk factors, along with sustained education regarding non-modifiable risk factors, provide the best combination for reducing stroke prevalence, regardless of the type of stroke (Alharbi et al., 2019).

As the fifth leading cause of death in the United States, the resultant individual and collective impact of stroke are noted to be complex and dependent upon multiple factors. The location in the brain where the stroke occurs and the amount of damage to brain tissue are two such factors. Each side of the brain controls the opposite side of the body. Subsequently, a stroke on the right side of the brain can result in hemiparesis (weakness) or hemiplegia (paralysis) on the left side of the body as well as visual disturbances, impulsive behavior, and pronounced memory loss. Additionally, a stroke on the left side of the brain can result in hemiparesis or hemiplegia on the right side of the body, difficulty with speech, delayed or cautious behavior, and memory loss (American Stroke Association, 2019e). In many instances, the residual effects of stroke are prolonged or irreversible.

Stroke in African American Women

As a leading cause of long-term disability and leading cause of preventable disability (CDC, 2017a), stroke is the fourth leading cause of death among women in the United States and fifth leading cause of death for men (American Council on Science & Health [ACSH], 2017). Twice as many women die annually from stroke than from breast cancer (CDC, n.d.b). Compared to men, a stroke tends to be more severe and have longer lasting residual effects in women (American College of Cardiology, 2018; Appelros et al., 2009; Lutfiyya et al., 2008; Strimike, 2010). Additionally, women have recurrent strokes more frequently than men (Girijala et al., 2017). The greater and more long-standing effects of stroke on women compared to men makes it even more perplexing that substantially fewer studies have been conducted analyzing the magnitude of stroke in women, its associated risk factors, causes, and health outcomes (Roquer et al., 2003).

African American women experience one of most disproportionate stroke burdens and tend to be highly underrepresented in stroke research (CDC, n.d.c; Lutfiyya et al., 2008; Worrall et al., 2002). For African American women, the likelihood of having a stroke is greater than any other group of women in the United States (CDC, n.d.a). This is thought to relate to the fact that younger African American women bear a disproportionate burden of stroke risk factors starting at an earlier age compared to white women (Jiménez et al., 2019). There is emerging recognition that stroke incidence has become more prominent at a younger age in African American women (Howard et al., 2011; Jiménez et al., 2019; Towfighi et al., 2010). In addition, evidence of decreased awareness of elevated stroke risk and inadequate knowledge about stroke risk factors

among African American women (Sharrief et al., 2016) affirms that increased research targeting African American women is warranted.

Stroke Research

The majority of stroke research has long been concentrated on men and older populations. African Americans experience higher stroke incidence and mortality for all stroke subtypes than any other racial group in the United States (CDC, 2017a; Ovbiagele & Nguyen-Huynh, 2011; Stansbury et al., 2005). Carnethon et al. (2017) revealed that stroke mortality rates have decreased by 80% across all age groups; however, there has been no notable decrease “in the magnitude of the African American to white racial disparity in stroke mortality” (p. e395). Yang et al. (2017) further reinforced this disparity by specifying that there has not been an obvious decline in stroke mortality among African Americans since 2012. Additionally, Hunt et al. (2014) emphasized that the average age-adjusted stroke mortality rate is 43% higher in African Americans compared to the national average and 47% higher than in non-Hispanic whites. Moreover, age-adjusted mortality rate for stroke is approximately 40% higher for African American women than for white women (Mensah, 2018).

Researchers have recently discovered a midlife stroke surge. The greatest increase in stroke prevalence occurs in women during the transition from ages 35-44 to 45-54, which yields a stroke prevalence among women in the population between the ages of 45-54 that is twice that of men (Strimike, 2010; Towfighi et al., 2010). This disparity is believed to most likely occur in relation to estrogen levels produced by the ovaries in premenopausal women (Reeves et al., 2008; Rexrode, 2010). In conjunction with the

increase in stroke occurrence among 45-54-year-old women, it is more alarming that stroke prevalence in the broader female age range of 35-54 has tripled over the past two decades while remaining stable among men (Towfighi et al., 2010). This increase in stroke prevalence is believed to be due to a higher rate of increase in vascular risk factors, such as high blood pressure, high cholesterol, and increased waist circumference in women compared to men during midlife (Towfighi et al., 2007). The higher rate of stroke incidence and mortality in African American women (Howard et al., 2011), combined with the three-fold increase in stroke prevalence among 35-54-year-old women, means that members of this group are highly vulnerable to the life-changing effects of stroke. Insufficient knowledge regarding stroke and stroke risk factors among African American women further exacerbates the situation.

Differences in Stroke Knowledge and Stroke Risk

The increased rate of stroke prevalence and mortality in African American women compared to other populations is highly correlated with their lack of stroke knowledge and level of risk factor prevalence (Henry-Okafor et al., 2012; Lutfiyya et al., 2008; Sallar et al., 2010). Sharrief et al. (2016) examined numerous studies that assessed stroke knowledge or disparities in stroke knowledge among African Americans and concluded that knowledge deficits exist in various domains of stroke literacy, symptomology, and risk factor identification. Additionally, younger age and lower socioeconomic status appear to negatively influence stroke knowledge (Lutfiyya et al., 2008; Williams et al., 2010; Winham & Jones, 2011). A study conducted in four rural, predominately African American counties in the Mississippi Delta revealed evidence of

insufficient stroke knowledge among residents (Sallar et al., 2010). The study found that 17% of respondents could not identify any of the five stroke symptoms presented on the questionnaire; and of that percentage, 84% were 44 years of age or younger. Further, of the 188 respondents in the study stroke risk factor identification was lacking, as evidenced by only 25% of participants recognizing between zero and three of 12 risk factors presented (Sallar et al., 2010). Knowledge of stroke symptoms is the key to seeking timely care in the event of a stroke; however, health-seeking behavior among African American women continues to be impeded by the existing gap in overall stroke knowledge.

African American women differ from men and other groups of women in terms of the number of stroke risk factors they possess. Stroke risk factors that tend to be more prevalent in African American women, particularly among those 35-54 years of age, include overall obesity (2.7% higher) and three components of metabolic syndrome, (i.e., abdominal obesity (2% higher), hypertension (3% higher), and hypertriglyceridemia; Henry-Okafor et al., 2012; Rexrode, 2010; Roquer et al., 2003; Towfighi et al., 2010). Additional risk factors that exist at increased levels in African American women are diabetes, family history, physical inactivity, poor diet, and smoking (Braun et al., 2016; CDC, 2019d; Ovbiagele & Nguyen-Huynh, 2011; Worrall et al., 2002). Notable prevalence of risk factors occurring at much higher rates among African American women is further reflected in the fact that more than two in five women are diagnosed with high blood pressure, an estimated three in five are diagnosed with obesity, and one in eight have clinical diabetes (CDC, n.d.a). Rexrode (2010) completed a study that

revealed depression as another contributor to stroke due to decreased medication compliance and poorer health behaviors in females who possess existing stroke risk factors. Lack of information and misunderstanding about mental health, as well as reluctance and inability to seek mental health services (National Alliance on Mental Illness [NAMI], 2019), contributes to depression remaining undertreated in African Americans and further exacerbates the severity of existing stroke risk factors in African American women.

In summary, the aforementioned studies underscore the relationship between inadequate health knowledge and stroke susceptibility in a population whose health is further impacted by exigent circumstances and obstacles that impede access to and use of preventive health services. The studies also acknowledge that there is still much work to be done to improve stroke knowledge and prompt risk reduction behaviors among African American women. Furthermore, because women, particularly African American women, have typically not been the subject of extensive stroke research, the impact of stroke on young African American women is a public health issue that commands further exploration.

Barriers to Stroke Prevention in African American Women

Decreased awareness of stroke risk factors poses a barrier to stroke prevention efforts in high-risk African American women; however, poor control of known risk factors presents a similar challenge. Increasing awareness of stroke risk factors represents the initial step in reducing stroke prevalence (Christian et al., 2007; Ferdinand, 2016; Ferris et al., 2005), followed by measures that promote control of modifiable risk factors.

Nevertheless, control and reduction of modifiable stroke risk factors are major barriers to stroke prevention strategies.

Health behavior and health education theory (and their associated constructs) can guide the development of stroke prevention strategies and interventions. Social cognitive theory (SCT) posits that behavior change, which includes risk reduction behavior, is based on the relationship among personal, behavioral, and environmental influences (Kelder et al., 2015). As a construct of SCT, self-efficacy has been examined as a predictor of the ability to control or reduce health risks (Martin et al., 2008), including diet, physical activity levels, and smoking behavior (Mansyur et al., 2013). The importance of self-efficacy in disease prevention was highlighted by Warren-Findlow et al. (2012), whose research confirmed that strong self-efficacy was statistically correlated with a higher prevalence of adherence to five out of six recommended self-care behaviors for managing hypertension (medication adherence, low salt diets, increased physical activity, non-smoking behavior, and weight management). As hypertension is a major stroke risk factor, these studies support the need to examine underlying factors that foster stroke prevention self-efficacy, particularly among African American women.

Disbelief about risk factor diagnosis and corresponding treatment non-adherence are additional barriers to stroke prevention in young and middle-aged African American women. Many women are hesitant to accept a diagnosis of hypertension due to lack of associated symptoms. Non-adherence behavior for diagnoses results from an identified set of variables. For example, individual, provider, and environmental factors are among the common reasons cited by African American women (aged 35 years and older) as

barriers to adherence to treatment and prevention recommendations (Fongwa et al., 2008). Depression, medication side effects, poor communication from physicians, lack of physical activity resources, and social stressors were additional reasons cited for non-adherence to treatment recommendations (Fongwa et al., 2008). Ford et al. (2009) also cited medical expenses, low-income status, lack of insurance, fatigue, and busy schedules as impediments to disease prevention in general. Fatalism (belief that a disease is inevitable) is another notable barrier to adherence to positive behavior change (Mudd-Martin et al., 2015) and has been documented as more prevalent among ethnic minority populations (Perfetti, 2018). This fact is underscored by Aycock et al. (2015), who expressed that risk reduction interventions are often futile efforts within the African American population, as lower perceived control of stroke is associated with lower intentions to reduce modifiable risk factors.

Symptom-focused and delayed healthcare-seeking behavior pose further barriers to stroke prevention in African American women. Shaw et al. (2017) emphasized that some women present to a healthcare setting more than 12 h after the onset of symptoms, and their prognosis becomes even more dire when they already have a high-risk clinical profile. This is particularly evident in the southern region of the United States. For example, Appel et al. (2005) purported that “the lived experiences of southern low-income women have been to interact with the healthcare system only when experiencing obvious pathologies, or when in some way incapacitated and unable to carry out their activities of daily living” (p. 316). A symptom-focused, delayed process of seeking care later rather than sooner is directly related to the poor cardiovascular health outcomes

experienced by African American women (Banks & Dracup, 2007; Shaw et al., 2017). Such outcomes are evidenced by the fact that African American women who reside in rural southern geographic locations experience cardiovascular events, such as stroke, in a greater proportion when compared to the African American population in its entirety and other populations in general (Cornell et al., 2009). Additionally, rural medically underserved southern regions yield higher rates of delayed healthcare provision (Rural Health Information Hub [RHIhub], 2019).

There is ample evidence showing that belonging to one of the highest risk populations for stroke and residing in a rural environment places young and middle-aged African American woman in an unfavorable position regarding their health and well-being. Thus, the relationship between rurality and health warrants further exploration for greater clarity on how these combined elements heightens health risk.

Rurality and Health

Rural areas are generally low-income, medically underserved regions that provide “limited opportunities to gain health information” (Appel et al., 2005, p. 316). Recent research conducted by James et al. (2017) identified that rural communities generally have worse health outcomes than their urban counterparts, which is attributed to decreased access to health care, greater health and lifestyle challenges, and less diversity among its members. The Behavior Risk Factor Surveillance System (BRFSS) data, upon which the study was based, also revealed that racial/ethnic minorities in rural areas are often younger individuals who are less likely to have a primary care physician (James et al., 2017). Past research has largely attempted to gauge rural health risk and health status

based on disparities between rural and urban populations; however, James et al. (2017) suggested that more studies investigating health concerns pertaining to the intrinsic characteristics of rural locations and the health disparities specifically among rural communities alone are warranted. Furthermore, overall disparities in U.S. rural health led to the *Rural Healthy People* initiative that prioritizes rural health (Bolin et al., 2015). From among *Healthy People 2020*'s national priorities, rural stakeholders identified heart disease and stroke as one of its top 10 priorities of *Rural Healthy People 2020*.

As a rural priority population, African American women account for the highest stroke incidence and mortality among all racial/ethnic groups in the United States (CDC, 2017b). Since residents of rural communities experience the worst health outcomes, rural African American women remain at a distinct disadvantage regarding the relationship between their residential environment and stroke risk. Decreasing the likelihood of rurality contributing to health disadvantage requires that determinants of rural health status, such as geographical significance, lifestyle characteristics, health literacy, and risk factor prevalence, are examined to assess their individual and collective effect on stroke risk.

Geographical Significance (The Stroke Belt & Rural Delta)

Health disparities that exist in rural communities are entrenched in economic, social, racial, ethnic, and geographic factors. Common challenges to health in US rural communities include remote locale, poverty, high rates of uninsured residents, and sparse availability of local doctors, which all contribute heavily to lack of access to care and delays in healthcare-seeking behavior (Association of American Medical Colleges

[AAMC], 2017). Although rural Americans comprise only 17% of the U.S. population, Bolin et al. (2015) described its negative geographic footprint regarding health as vast, attributed partially to the fact that only 9% of doctors and 16% of registered nurses practice in rural areas.

Multiple states in the South have been referred to as the Stroke Belt due to the elevated rates of age-adjusted hypertension and stroke deaths (Choi, 2012). The Stroke Belt is a geographic region initially comprised of the following eight southeastern states: Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee. Currently the Stroke Belt is an 11-state region consisting of the initial eight states and the addition of Indiana, Kentucky, and Virginia. Within these states, the risk of stroke is an estimated 34% higher than in other areas of the country (Heart Attack and Stroke Prevention Center, 2019). A significant number of counties in Stroke Belt states are rural, marginalized communities, of which African Americans constitute a large proportion of the population.

There is also a portion of the United States that is classified as the rural Delta. The Delta region includes 252 counties and parishes in Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee. Notably, the rural Delta experiences worse outcomes from all chronic diseases compared to rural areas nationwide (RHIhub, 2017). Consequently, African American women who reside in states that are both a part of the Stroke Belt and the rural Delta are at greater risk of enduring the heavy burden of stroke.

Lifestyle Characteristics

Lifestyle characteristics, such as diet, physical inactivity, obesity, and smoking, account for approximately 78% of the variance in chronic disease risk and are among the leading causes of premature mortality in Western populations (Adams et al., 2013). The American College of Obstetricians and Gynecologists (ACOG, 2014) along with Ford et al. (2009) explained that minority women residing in the rural underserved United States have high self-reported rates of smoking, inadequate physical activity levels, and poor diet, of which each risk behavior compounds hypertension severity. Additionally, this same population has less access to health care, obtains fewer recommended preventive screenings, and has higher self-reported rates of fair or poor health status (ACOG, 2014). Furthermore, difficult social circumstances and social isolation have been shown to impede access to healthcare information (Appel et al., 2005; Hovick et al., 2011). Additional studies affirm that these cumulative lifestyle characteristics are widespread in rural African American women, which helps to further explain why they experience the highest prevalence of hypertension and cardiovascular disease deaths among all women (Appel et al., 2005; Braun et al., 2016; Ford et al., 2009; Smith et al., 2008).

Health Literacy

According to the USDHHS-ODPHP (n.d.b), health literacy is “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (para. 1). Heinrich (2012) posited that health literacy is essential to health behaviors and health maintenance and should be viewed as a sixth health vital sign. The importance of health literacy is also

reflected in the foundational principles and overarching goals of *Healthy People 2030* (USDHHS-ODPHP, n.d.b).

Rural populations have been identified as having lower levels of all forms of literacy compared to their urban counterparts, and health literacy deficits are particularly significant due to commonly associated poor health status (Zahnd et al., 2009). Riley et al. (2012) emphasized that lower rates of health literacy among rural residents is compounded by the burden of limited access to health care. The researchers further described low levels of health literacy as a frequently overlooked barrier to preventive health screenings among rural communities; subsequently, this issue of reduced healthcare-seeking behavior is magnified for racial/ethnic minorities who tend to have lower levels of education and reside in impoverished rural counties.

There is critical evidence that low or limited health literacy may be the entry point in the chain of circumstances that lead to poor health outcomes (Adams et al., 2013; Hoover et al., 2015; Osborn et al., 2011; Zahnd et al., 2009). Those outcomes include higher mortality rates from heart disease, stroke, and all cancers combined, notably among African Americans. This largely results from the fact that low or limited health literacy is linked to lack of health knowledge, low self-efficacy, and decreased preventive self-care behavior (Osborn et al., 2011). Given that African Americans are a prevalent population in rural southern communities (Probst & Ajmal, 2019), these individuals can be disproportionately burdened with low health literacy and experience disparities in overall health and health outcomes.

Risk Factor Prevalence

According to the CDC (2017b), rural Americans are more likely to die from heart disease, cancer, unintentional injuries, chronic lower respiratory disease, and stroke than their urban counterparts. Among rural residents, there are higher documented rates of hypertension, tobacco use, physical inactivity, poor diet, and obesity, which, in turn, yield higher incidence of heart disease and stroke and higher death rates from both diseases (RHIhub, 2017). Such risk factors exist in higher proportion among rural racial and ethnic minorities. For example, 54.8% of African American women in the United States are obese (Hales et al., 2017), which is in part a major risk factor for many of the health conditions plaguing this population. Furthermore, a study by Davis et al. (2014) revealed that social determinants such as higher levels of chronic stress among African American women can intensify existing risk factors, thereby increasing the risk of a cardiovascular event. Additionally, family history is a significant non-modifiable risk factor that cannot be overlooked as a key threat for stroke risk. Aycock et al. (2015) posited that due to earlier stroke onset in African Americans and higher stroke death rates, it is imperative that researchers examine whether there is a familial occurrence of stroke, and if so, understand what that means as a source of potential health risk. The aforementioned studies highlight continued concern surrounding the prevalence of numerous health risk factors in rural populations without significant progress towards more control of those risk factors. Subsequently, compared to urban counterparts, mortality and life expectancy rates in rural populations are falling behind, particularly among females (Kapral et al., 2019).

Stroke in Rural Arkansas

Arkansas is designated as one of the states in the Stroke Belt. Due to its elevated stroke mortality, the state has been deemed to be in the buckle of the Stroke Belt where the risk of stroke is even more pronounced (Shrira et al., 2008). Arkansas currently ranks seventh in the nation for stroke mortality, and stroke is the fifth leading cause of death among its residents (CDC, 2019c).

Although the percentage of Arkansans living in rural areas declined in recent years, Arkansas is still considered a rural state. Approximately 41% of the population in Arkansas currently resides in a rural county, which is much higher than the rural national average of 14% (University of Arkansas System: Division of Agriculture, Research & Extension [UAEX], 2019). Many of the risk factors that pose the greatest threat to health are prevalent in rural Arkansas, particularly in Phillips County, which boasts the lowest life expectancy of all 75 counties in the state. Phillips County is a county in the Delta region where 45% of its adult population is obese (second highest in the state), which is well above the Arkansas average of 35% and the national average of 39.8%. Additionally, 36% of residents are physically inactive and 26% are smokers (County Health Rankings, 2019). Each of these risk factors is a significant contributor to stroke risk; however, the likelihood that a risk factor or health behavior will be changed is considerably decreased if perceived threat is lacking.

According to recent data, 62.8% of Phillips County, Arkansas is African American and 53% are female (U.S. Census Bureau, 2018). In addition to the excess rates of obesity, physical inactivity, and smoking among these residents, hypertension is

another prevalent risk factor among the African American women. Middle-aged African American women (35-54-years) are important to examine because of the relative risk of stroke for African Americans compared to whites occurs during younger and middle age (Sallar et al., 2010). Aycock and Clark (2016) further emphasized the importance of exploring stroke in midlife as younger adults may have a greater likelihood of inaccurate perception regarding their actual stroke risk.

Risk Perception

According to Yang et al. (2018), risk perception is a valuable tool in the fight against chronic diseases. In addition, accuracy in perceived threat awareness is necessary for promoting healthy lifestyles and behavior modification that leads to health risk reduction. Individual characteristics, general health perceptions, knowledge of illness/disease, risk factor status, family history of disease, perceived control, personal experience, and media exposure are among the myriad of variables affecting personal risk perception (Fiant et al., 1999, as cited in Aycock et al., 2019). A common theme regarding risk perception is that individuals and groups who are at greatest risk of developing or experiencing a major health event, such as stroke, are often those with the lowest perceived risk of a potential health occurrence (Aycock et al., 2015; Brawarsky et al., 2018; Ferris et al., 2005; Ford et al., 2009). For example, despite an increased prevalence of stroke risk factors, such as obesity, poor diet, and low physical activity levels, many African Americans often underestimate their vulnerability to a health event and perceive their risk of stroke and other negative health occurrences as being similar to or lower than others. This appears true even in light of more pronounced stroke risk

factors, such as hypertension and diabetes (Graham et al., 2006). Associated studies provide insight into the inconsistent relationship between actual versus perceived health threat and reveal the importance of reducing or eliminating this discrepancy.

Helou et al. (2018) conducted a retrospective cross-sectional study comprised of 5,863 participants (mean age 49.4 ± 7.1 years) who received a routine health evaluation. The goal of the study was to evaluate the possible relationship between clinical characteristics (health conditions) and subjective estimation of cardiovascular risk. Results of the study revealed that based on lifetime risk score (LRS), 45.7% of the subjects were at intermediate risk for cardiovascular disease and 54.3% were at high risk. Approximately 84% of the study participants underestimated their cardiovascular risk. Furthermore, age range of participants, smoking, elevated cholesterol, physical activity, and use of blood pressure medication and cholesterol—lowering medications were all identified as contributors to risk underestimation.

In a study assessing weight perception and health threat, Moore et al. (2010) identified a divergence between perceived versus actual health risk. Overweight African American women in the study not only underestimated their true weight category but also perceived that their risk for cardiovascular disease, high blood pressure, type 2 diabetes, and elevated cholesterol was the same as women who were not overweight or obese. Weight misperception remains a prevalent concern among African American women, due in large part to the cultural norms that bolster the attractiveness of overweight or obese females. This mindset is revealed in a quote from a qualitative study conducted with 50 African American women: “I think that as black women, we have been brought up to

think that big is beautiful” (James et al., 2012, p. 667). Not only is this quote reflective of the strength of cultural influence, it is also a distinct example of how risk perception becomes and remains skewed, allowing weight-related health risks for stroke to continue to persist at dangerous levels within this population.

An additional study by Brawarsky et al. (2018) investigated the accuracy of self-perceived risk for developing the following health conditions: coronary heart disease (CHD), diabetes, breast cancer, and colorectal cancer. Although results showed that both low- and high-risk participants incorrectly estimated their risk for CHD, there was a notable discrepancy in accuracy of perceived risk for diabetes, breast cancer, and colorectal cancer. Specifically, 60-75% of high-risk participants underestimated their risk, while approximately 13-40% of low/average-risk participants overestimated their risk. These results further underscore that self-perception of risk is often not at an accurate or acceptable level to stimulate lifestyle modifications and risk reduction behavior.

Research also suggests that possessing health risk factors does not equate to improved assessment of disease risk. Webster and Heeley (2010) explained that risk factors do not operate independently; instead, they accumulate in such a way that minor elevations in multiple risk factors can exponentially increase the likelihood of disease occurrence. Rural African American women are among the most susceptible to health events, such as stroke, due to their frequently elevated number of health risk factors, which also includes familial predisposition and inaccuracies in risk perception.

Family History and Risk Perception

Family history is a considerable risk factor for chronic disease development. Wang et al. (2012) asserted that “the proportion of the population at elevated risk as a result of their family health history is sizable” (p. 392). For specific conditions such as diabetes and certain types of cancer (e.g., breast, ovarian, endometrial, prostate, and colorectal), population-based studies revealed that those who had a moderate or strong familial risk also developed diabetes 29% of the time and one of the aforementioned cancers 22% of the time (Wang et al., 2012). Family history and perceived risk have also been studied in regard to lung cancer (Chen & Kaphingst, 2011), prostate cancer (Bloom et al., 2006), diabetes and depression (Vornanen et al., 2016), and cardiovascular disease (Bloom et al., 2006; Imes & Lewis, 2014). The significance of family history (Aycock et al., 2015; Chung et al., 2016; Kulshreshtha, 2015) and risk perception of stroke (Aycock et al., 2015; Chung et al., 2016) have also been identified as critical areas for assessment and intervention in the battle to improve population health. It is concerning that in many of these studies, those with a family history of stroke did not perceive themselves to be at any higher risk than those without a family history. Consequently, the identification of the prevalence of family history in the development of major conditions, such as stroke, has shown the need for greater exploration of the association between family history of stroke and perceived risk of stroke occurrence.

Stroke is a life-altering health condition in which family history is a noted contributor to the overall rate of occurrence. Aycock et al. (2015) deemed that family history increases the risk of stroke as a result of genetic factors, culture, and/or shared

environment. Specifically, “family members may have a genetic tendency toward hypertension, diabetes, and obesity and common social behaviors that may influence dietary habits, activity levels, and use of cigarettes and alcohol” (Aycock et al., 2015, p. E1). Each of these variables tends to be present at elevated levels among rural African American women (Davis et al., 2014), which further reveals the urgent need for the targeted interventions that can be developed based on research specific to this community.

Personal perspective is another factor that warrants consideration. Many diseases may be viewed as more threatening than others, which can influence personal perspective regarding the significance of family history and perceived threat of a health event (Vornanen et al., 2016). For instance, cancer is generally viewed as a greater threat than other health conditions (Beal, 2014); however, there is variability in the level of perceived threat among those with a family history of cancer. A study by Chen and Kaphingst (2011) revealed that a relationship between family history of lung cancer and perceived risk was significant among those who had never smoked, but there was not a significant relationship between family history of lung cancer and risk perception among former or current smokers. Bloom et al. (2006) explored family history and risk perception regarding prostate cancer within African American men who have a two-fold risk based on ethnicity and family history. Results revealed that the hypothesis that family history is associated with increased risk perception was not supported by the study. Rather, it was younger, better-educated men and those with poorer mental health who perceived themselves to be at increased risk. In an additional study examining how

family history relates to diabetes, cardiovascular disease, cancer, and depression risk perception, Vornanen et al. (2016) found that the highest level of risk perception was among those with a family history of diabetes.

Despite its effect on population health, there is no clear evidence that suggests that stroke is viewed as one of the more feared diseases, even among African American women who are most susceptible. If stroke is possibly viewed as less threatening than other adverse health conditions, there is an even greater need to explore factors such as family history and perceived threat as means of facilitating preventive efforts.

Kulshreshtha et al. (2015) concluded that even though family history is a confirmed stroke risk factor, more studies are needed to definitively verify its importance.

Additionally, Aycock et al. (2015) described the lack of research examining whether family history of stroke affects stroke risk perception and possibly behavior change.

Behavioral Intention and Risk Perception

Perceived risk of a health event often precedes the adoption of healthy behaviors and intent to implement behavior change, but lack of perceived threat or inaccuracies in threat perception can hinder or reduce the motivation to enact needed change. A review of the literature showed mixed results among four studies examining perceived risk and health-related behavior change. Even among individuals with several modifiable risk factors and a family history of cardiovascular disease, low risk perception resulted in little to no risk reduction behaviors (Imes & Lewis, 2014). Similarly, a study by Alzaman et al. (2013) revealed that behavior change is not rooted in risk awareness alone. This discovery is supported by Warren-Findlow et al. (2012) who found that risk perception

must often be supplemented by self-efficacy before African American adults implement hypertension-reducing health maintenance behaviors.

Health Belief Model and Risk Assessment

Health threat awareness and risk perception comprise the core of many health behavior models and theories. Knowledge, beliefs, and attitudes about health are important to assess as they contribute to health-related decisions and behaviors. These contributing factors can be addressed using theoretical frameworks to guide health education interventions and foster health behavior change. The integration of health education and health behavior theories and models can enhance the effectiveness of stroke prevention strategies and programs within a priority population.

The health belief model (HBM) proposes that individuals who view themselves as susceptible to a serious health threat will take corrective action. The HBM is widely used to “predict whether and why people will take action to prevent, to screen for, or to control illness conditions” (Skinner et al., 2015, p. 76). Key HBM constructs include:

- Perceived susceptibility – personal beliefs about the likelihood of contracting or developing a disease or condition;
- Perceived severity – personal beliefs about the seriousness and consequences of contracting or developing a disease or condition;
- Perceived threat – result of the combination of personal beliefs about susceptibility and severity of contracting or developing a disease or condition;
- Perceived benefits – personal beliefs about advantages of taking action to prevent or reduce the risk of contracting or developing a disease or condition;

- Perceived barriers – personal beliefs about obstacles or negative consequences of taking action to prevent or reduce the risk of contracting or developing a disease or condition;
- Cues to action – internal or external triggers that influence or instigate behavioral activity to prevent or reduce disease risk; and
- Self-efficacy – personal belief that a recommended health behavior change can be successfully executed (Skinner et al., 2015).

The HBM helps to identify an individual's awareness of a serious health threat and perceived vulnerability to that threat, which is essential to motivating behavior change and increasing health care-seeking behaviors (Anderson et al., 2011; Dearborn & McCullough, 2009; Kleindorfer et al., 2008). Furthermore, risk perceptions impact response to and processing of new health information (Wang et al., 2009), which can tip the scales of an individual's perceptions of benefits versus risks associated with adopting a new health behavior or changing a potentially harmful one. Additionally, Skinner et al. (2015) indicated that cues to action provide the impetus for the implementation of health risk reduction strategies; and self-efficacy increases the likelihood that behavior change is initiated and sustained.

Assessing stroke risk factors and beliefs about stroke risk can aid stroke prevention efforts, particularly among those at greatest risk. Although researchers have explored actual versus perceived health threat for multiple health conditions, none of the studies have specifically assessed stroke risk perception in rural Arkansas middle-aged African American females. In addition, accuracy of risk perception has not been as

extensively investigated as level of risk perception, although both are important for the initiation of preventive health behavior. Identifying individual risk is a prerequisite to improved accuracy of perceived threat; therefore, the HBM is the theoretical framework that is used in this study to examine: (1) perceived susceptibility to stroke, (2) perceived severity of having a stroke, and (3) whether perceived threat results in 6-month intention to change risk behaviors among rural middle-aged African American women in Arkansas. Further, constructs of the HBM are assessed based on their central role as part of the Cerebrovascular Attitudes and Belief's Scale-Revised (CABS-R) survey instrument (Sullivan & Waugh, 2007).

Summary

From the review of the literature, it is shown that stroke risk is high and risk perception is low among African American women. The higher rate of stroke incidence and mortality in African American women, coupled with the three-fold increase in stroke prevalence among 35-54-year-old African American women, indicates the need for additional studies to explore why the national decline in stroke mortality is not reflected in this group. Furthermore, stroke health outcomes are markedly worse in rural counties in the nation, particularly those that are geographically part of the Stroke Belt. Family history, health behaviors/risk factor prevalence, and threat perception are also shown to affect stroke risk among rural residents, but there is inconsistent evidence regarding a clear relationship among these factors. No studies were found that examined the impact of family history, risk factor prevalence, and risk perception on behavioral intention in rural middle-aged African American women in Arkansas. Therefore, this study will be

useful in helping to understand perceived threat of stroke based on self-identified risk factors and future intention to change health risk behaviors in rural middle-aged African American women in Arkansas.

CHAPTER III

METHOD

For this study, the researcher used a cross-sectional and survey-based method to acquire information about stroke risk factor prevalence, risk perception, attitudes and beliefs about ability to control stroke risk, as well as benefits and barriers to stroke risk reduction among rural Arkansas African American women aged 35-54. In addition to investigating beliefs about stroke, the researcher examined differences in risk perception in African American females with a family history of stroke compared to those without a family history of stroke. Further, the relationship between the independent variables of personal stroke risk factors and the dependent variable of perceived stroke severity were explored. Finally, the predictive ability of selected personal stroke risk factors was examined to assess whether 6-month intention to change personal stroke risk factors predicts perceived severity of stroke.

Population and Sample

The researcher observed guidelines outlined by Alreck and Settle (2004) that emphasized the importance of establishing inclusion and exclusion criteria for the study population and specifying the study unit so that it is the smallest single entity from which research data can be obtained. The study took place in the Delta region of Arkansas, specifically Phillips County. According to the U.S. Census Bureau (2018), the estimated population for Phillips County was 18,029; and the total population of women between the ages of 35 to 54 years of age was 2,346. The percentage of the population in that

region that is African American is 62%. Therefore, the total population of African American females aged 35 to 54 is approximately 1,454.

It was important for a large enough sample size to be obtained in order to ensure that the statistical procedures utilized were powerful enough to detect significance. Isaac and Michael (1995) indicated that larger sample sizes result in “smaller sampling errors, greater reliability, and increase the power of the statistical test applied to the data” (p. 101). The researcher conducted an a priori power analysis using G*Power 3.1.9 to determine the minimum sample size required to find statistical significance using Pearson’s correlation analysis. With a desired level of power set at .80, an alpha (α) level at .05, and a small to moderate effect size of .20 (ρ), a minimum of 150 participants were required to ensure adequate power. Additionally, a minimum of 128 participants were required to ensure adequate power for an independent samples *t*-test with a small to moderate effect size of $d = .50$ (Cohen, 1988). Finally, to ensure adequate power for a multiple regression using a small to moderate effect size ($f^2 = .10$), a power analysis indicated that a minimum of 151 participants were required (Ellis, 2010). Given these analyses, the researcher sought to recruit a sample size of 165 participants to ensure adequate power for all tests.

The researcher recruited participants through University of Arkansas for Medical Sciences (UAMS) East Regional Campus (Phillips County) and the Arkansas Minority Health Commission (AMHC). The researcher also considered the feasibility of access and data collection, research relationships with study participants, and ethics. In this study, potential sensitivity to the research topic (stroke risk factors) and confidentiality

might have been influenced by the study setting. The aforementioned agencies granted access to potential study participants and use of their facilities for the study to offset the sensitive nature of the study topic. The researcher had increased access to rural African American women who may have otherwise been difficult to access. The researcher used criterion sampling to select the study participants. Criterion sampling is one wherein participants meet some predetermined criteria to best serve the purpose of the study (Leedy & Ormrod, 2013; Robert Wood Johnson Foundation, 2008). The criteria for participants in this study were African American women 35-54 years of age who resided in Phillips County, Arkansas. Recruiting participants in settings in which they already have an established relationship promoted an additional level of comfort about participating in research.

Protection of Human Participants

Risks associated with participation in this study were low. The researcher attempted to allay the possibility of emotional risks by providing a list of local and online stroke prevention resources to participants. Participation was voluntary, and participants were able to discontinue the survey at any time without penalty. Every effort was made to protect participant confidentiality throughout the survey process. The researcher obtained permission for this study from the Institutional Review Board (IRB) of Texas Woman's University. The responses from the survey were kept private in accordance with the Privacy Act (1974), and a data management protocol was in place to store completed surveys in a separate file from the data file containing identifiable data. All completed survey records were stored in a locked cabinet in the researcher's private office.

Participant Recruitment

The researcher worked with the current Phillips County health education specialist and health program specialist who both have access to community residents. To complete initial recruitment of study participants, the researcher collaborated with the Director of Outreach for (UAMS) East Regional Campus (Phillips County) to obtain pre-existing dates of nutrition and weight loss health coaching classes, monthly wellness luncheons, along with dates of health fair events. There was also similar collaboration with the AMHC health program specialist who coordinates their Faith Network health events. Upon approval from Texas Woman's University IRB, participants were recruited in community partner locations during scheduled health coaching classes, wellness luncheons, or health fair events. In the event that face-to-face recruitment did not yield the desired number of respondents, the researcher worked with the UAMS Director of Outreach to recruit routine clinic attendees via phone and email requests. The researcher provided all potential participants an overview of the purpose of the study with the specification that their participation was voluntary, and they could withdraw from the study at any time with no penalty. Each woman who agreed to participate indicated if she preferred to complete the Qualtrics survey onsite or at a later date via a web address provided. Data collection via online survey administration is currently the most used survey method (Johnson & Christensen, 2020). Several advantages of electronic surveys include cost reduction, increased ability to reach a larger population, greater anonymity of responses to sensitive topics, and immediate availability of responses for data analysis (Cope, 2014). All the participants who chose to complete the survey onsite were provided

a quiet, private area in which to complete the survey on an iPad or laptop provided by the researcher. A paper-pencil option was made available for women who wished to participate but were not comfortable using a computer. Participants who opted to complete the survey online at a later time were given the web address for the Qualtrics survey link, or they opted to receive it by email. The last page of the survey provided an option for participants to enter their name and address for a prize drawing.

The researcher used a lottery incentive to recruit volunteers and enhance participation within the survey. Porter and Whitcomb (2003) recommended the use of lottery incentives to bolster recruitment and participation rates and as a token of appreciation for those who subsequently participate. When utilizing incentives, the researcher carefully considered the ethical implications of offering an inducement to prospective participants to encourage study participation (Jacobsen, 2017; Resnick, 2015) while also ensuring that the incentive did not constitute coercion or influence decision-making and reporting (Resnick, 2015). According to Jacobsen (2017), it was appropriate for researchers to enter everyone completing a questionnaire into a drawing to increase the overall participation rate. Potential incentives included drawings for gift cards and gift certificates. For this study, 25 Walmart gift cards, valued at \$10.00 each, were raffled to participants who provided their name and address on the final page of the survey. Once all data collection activities had been terminated, an individual (other than the researcher) randomly pull 25 cards from a container with participant entries. Additionally, one final name was randomly selected for the grand prize Visa gift card worth \$50.00. The gift

cards were then mailed to each individual at the address provided at the conclusion of the survey.

Instrumentation

Survey research provides an opportunity for researchers to sample part of a population to acquire information about characteristics, opinions, attitudes, and previous experiences of the population as a whole (Leedy & Ormrod, 2013). Nardi (2018) pointed out that surveys contain standardized questions, allow for respondent anonymity, permit respondents to answer at their own pace, are better for sensitive and personal topics, and are ideal for computer-based and online completion, which are described as some of the most advantageous aspects in survey research. Identifying an appropriate survey tool to accurately capture the context of research questions and generate appropriate results was essential for conducting effective research. The self-report survey instrument for this study was the CABS-R. The CABS-R is a comprehensive, validated survey instrument developed by Debra Waugh in 2003 and later published by Karen Sullivan and Debra Waugh in 2007. The survey, developed based on the constructs of the HBM, was designed to assess four dimensions of stroke-related health beliefs among stroke/TIA survivors (Sullivan & Waugh, 2007). The instrument was also subjected to an expert review by one clinician and four researchers who had an average of 7 years of stroke-related professional experience. The CABS was later revised to test an expanded HBM, which included new items for the assessment of self-efficacy and subjective norms and resulted in the CABS-R. The expanded survey instrument was also validated in an at-risk population in which those with a prior history of stroke were excluded (Sullivan et al.,

2008). Factor analysis yielded strong results for perceived susceptibility, severity, benefits, and barriers for exercise and weight control. The internal consistency verified for the CABS-R (.65 to .94 for most survey items) and Cronbach's coefficient alpha of .89 for the three-item severity scale makes it a suitable tool for assessing stroke-related health beliefs as well (Sullivan et al., 2010). For further reinforcement of content validity, the researcher had two or three physicians who work with the target population review the survey instrument prior to its administration. The researcher received permission to use the CABS-R instrument for this study (see Appendix A).

The CABS-R comprehensively assesses four dimensions of beliefs about stroke severity, susceptibility to stroke, perceived benefits of undertaking stroke risk reduction behaviors, and barriers associated with undertaking such behaviors (Sullivan & Waugh, 2007). The survey consists of the following three parts: (a) personal information and health behaviors, (b) questions about personal feelings/perceptions regarding stroke and stroke risk factors, and (c) knowledge regarding stroke and stroke risk factors (see Appendix B). The specific scale format contains 27 questions in Part 1 pertaining to demographics, stroke health history, health conditions, and health behaviors. Blood pressure and diabetes status were reported based on prior clinical diagnosis. Family history of stroke, physical inactivity, height/weight, smoking status, alcohol consumption, and lack of medication adherence were all self-reported. The Part 2 subscale items for stroke beliefs and perceptions are comprised of three items assessing stroke severity. The remaining portion of Part 2 consists of subscale items assessing susceptibility, general intention, 6-month intention, benefits, barriers, ease, and subjective norms for the

following health factors: exercise uptake, smoking cessation, diabetes, medication adherence, high blood pressure, high cholesterol, weight status, and alcohol consumption. The final portion of the CABS-R is comprised of 19 questions to gauge stroke knowledge. Question 14 in Part 3 of the survey instrument was removed as it was not relevant to the study population; otherwise, the CABS-R was not altered in order to preserve its validity. Two items were added in a separate section (apart from the survey): (a) a question concerning each participant's age when they first learned a family member had a stroke and (b) a question regarding participants' current medications for reducing health risks—specifically, blood pressure, cholesterol, and diabetes medications.

A portion of the CABS-R was utilized by Aycock (2012) to investigate stroke risk factors in rural African Americans as well as the variables that influence exercise habits for stroke risk reduction. Coupled with the existing literature, composition of the instrument, and successful past usage of the CABS-R, there was substantive evidence that the survey instrument could be effectively utilized to assess risk perception and behavioral intention for reducing stroke in rural middle-aged African American women in Arkansas.

Pilot Test

Johnson and Christensen (2020) stressed the importance of pilot testing a survey instrument to assess whether it functions properly prior to collecting data. It is advised to pilot test a survey questionnaire with the research study population (Johnson & Christensen, 2020). Following this recommendation, the researcher pilot tested the survey with 10-20 females in Phillips County, Arkansas who meet study parameters. The pilot

testing took place at the UAMS East Facility (Helena Health Foundation site), and there were iPads and laptops available for those preferring to take the survey electronically. The pilot process allowed the researcher to test the survey protocol. For example, the researcher used the pilot test to gain information on question clarity, concerns with survey questions, appropriateness of instrument length and time budgeted, and usability of the online Qualtrics survey set-up. No problems were reported regarding online survey accessibility, question clarity, or completion time among pilot test participants, so the CABS-R instrument was used in its original format. Additionally, the pilot test allowed the researcher to conduct a preliminary test of data coding, data entry, quality control of the data set, and data analyses procedures.

Data Collection

Data was collected during Spring and Summer 2021 with a goal of 165 participants, which was determined based on the power analysis conducted to estimate the required sample size (n) necessary to draw accurate research conclusions. Edwards et al. (1997) stressed the need for a structured introduction when administering surveys. They suggested that the survey introduction include: an invitation to the participants to complete the survey, a brief description of the survey topic, a description of why the survey is being conducted, and an explanation of how the survey results will be used. Edwards et al. (1997) also recommended that researchers inform participants regarding the confidentiality and anonymity of responses and reduce apprehension among participants that they are being evaluated. Following these suggestions, the researcher implemented this format before beginning the data collection process. Additionally, the

researcher informed participants how they could enter the lottery to win one of the survey incentives.

Once the introductory script had been read to the participants, the researcher verbally presented the informed consent forms, obtained signatures on the forms, and provided directions for completing the survey instrument. The researcher then directed participants to a separate room where iPads and laptops were available for completing the survey instrument. If needed, writing utensils were distributed to the participants who opted for paper-pencil completion. Participants who were ineligible to take the survey because they did not meet the study parameters, did not wish to participate in the study, or had previously completed the survey at another location were instructed not to complete the survey and exited the room or event. Two sealed boxes were placed at the front of the room where informed consent forms and paper-pencil surveys were deposited. At the conclusion of every data collection session, the researcher transported the boxes to a secure location.

Data Analysis

The researcher exported the data from Qualtrics into the Statistical Package for the Social Sciences (SPSS) version 25 (George & Mallery, 2018). The researcher also entered data from paper-pencil surveys into SPSS for data analysis. Demographic data was reviewed to ensure that data analyzed was specific to rural African American women who met the 35-54 age specification. Variables were appropriately coded in preparation for statistical analysis. An analysis was conducted to obtain descriptive statistics of participants' beliefs about stroke. Responses for subscale items ranged from 1 (*strongly*

disagree) to 5 (*strongly agree*). Average mean scores were utilized as the measure for each area of perception assessed. This was the safer and preferred approach because if some respondents failed to answer a question, the mean average could still be calculated. In contrast, if sum scores are utilized, the overall range would be affected by unanswered items (Filsecker, 2014). In addition, independent samples *t*-tests were conducted to compare mean scores for the dependent variables (DVs) of perceived stroke susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction in participants with a family history of stroke compared to those without a family history of stroke (independent variables [IVs]). Cohen's *d* was also examined to look for effect size. Cohen's *d* was determined by calculating the mean difference between the two groups, and then dividing the result by the pooled standard deviation. Pearson's correlation was used to analyze the relationship between the number of personal stroke risk factors identified (IV) and the level of perceived stroke severity (DV) based on mean score. Hierarchical linear regression was conducted to assess which personal risk factor (6-month intention to change - IVs) is a greater predictor of perceived stroke severity (DV). Table 1 illustrates the research questions and hypotheses for this study.

Table 1*Research Questions, Hypotheses and Statistical Test*

Research Question and Hypothesis	Statistical Test
RQ1: Is there a difference in rural Arkansas middle-aged African American women with a family history of stroke compared to those without a family history of stroke regarding perceived stroke susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction? Hypothesis 1: There will be no statistically significant difference in rural Arkansas middle-aged African American women with a family history of stroke compared to those without a family history of stroke regarding perceived stroke susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction.	<i>Independent samples t-test</i>
RQ2: Are the number of personal stroke risk factors in rural Arkansas middle-aged African American women (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) related to perceived stroke severity?	<i>Pearson's correlation</i>

Research Question and Hypothesis	Statistical Test
Hypothesis 2: There will be no statistically significant relationship between the number of personal stroke risk factors in rural Arkansas middle-aged African American women (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) and perceived stroke severity.	
RQ3: Does six-month intention to change a set of personal stroke risk factors (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) predict perceived stroke severity among middle-aged African American women residing in rural Arkansas?	<i>Hierarchical linear regression</i>
Hypothesis 3: Six-month intention to change a set of personal stroke risk factors (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) will not significantly predict perceived stroke severity among middle-aged African American women residing in rural Arkansas.	

CHAPTER IV

RESULTS

Data was collected using Qualtrics as the platform for a web-based electronic survey that contained demographic questions and the CABS-R. The same survey questions were also administered through paper-pencil method with individuals who were not comfortable completing the electronic version. Response data was exported from Qualtrics to an Excel spreadsheet, and data from 101 paper-pencil surveys was manually entered by the researcher into the same Excel spreadsheet to combine all submitted participant responses. An identification (ID) variable was inserted into the spreadsheet to provide each participant a unique ID number. The Excel file was then opened in SPSS version 25. All data coding was performed by the researcher for consistency. Each variable in the data set was checked for scores that were out of range and identified errors were corrected. Responses from participants who completed the online survey too quickly (less than 2 seconds per question) were removed as well as responses from participants who completed less than half of the survey online or in paper-pencil format. This process resulted in the elimination of 19 surveys from the data set.

Sample Characteristics

Demographics

The sample consisted of African American women aged 35-54 in the rural Delta region of Arkansas, specifically Phillips County. A total of 171 women from Helena-

West Helena, Lexa, Marvell, and Elaine participated in the survey; however, only 152 surveys were usable for data analyses. Based on the increased risk of stroke in women aged 35-54, age was a specific requirement for inclusion in the study. Subsequently, all responses analyzed were from women who self-identified their age in the range of 35-44 (51.3%) or 45-54 (48.7%). Education and employment were not variables used in the study but were reported for demographic purposes. More than half of the sample had a college degree (52.3%), and the majority of participants (69.7%) were employed full time. Table 2 provides a summary of the demographic characteristics of the sample.

Table 2

Demographic Characteristics of the Sample (N = 152)

Characteristic	Frequency	%
Age		
35-44	78	51.3
45-54	74	48.7
Education Level		
Primary school	2	1.3
High school	66	43.4
GED certificate	4	2.6
University degree	79	52.0
Employment Status		
Retired	9	5.9
Part-time or casual work	31	20.4
Full-time	106	69.7

Note. One participant did not report education level, and six did not report employment status

Family History, Behaviors, and Health

The CABS-R survey elicited information regarding family history of stroke, lifestyle behaviors, and existing health conditions that have all been identified as risk factors for stroke. Each of these measures represent a variable in the research questions. Participants identified whether they have a family history of stroke and completed items assessing exercise beliefs. Respondents also completed sections on risk behaviors that applied to them specifically (e.g., smokers completed the smoking section). Less than half of the participants reported having a family history of stroke. Approximately one-third of the sample consumed alcohol on a regular basis, 20% reported smoking cigarettes, and nearly two-thirds of the sample did not achieve recommended levels of exercise for stroke prevention. The most common existing health conditions reported were overweight status and high blood pressure. Table 3 presents a summary of participants' family history regarding stroke, personal behaviors, and health conditions that contribute to stroke risk.

Table 3

Frequencies and Percentages for Family History, Behaviors, and Health

Risk Factor	Frequency	%
Inadequate Exercise	95	62.5
Overweight	90	59.2
High Blood Pressure	73	48.0
Family History of Stroke	68	44.7
Alcohol Consumption	50	32.9
Cigarette Smoker	30	19.7
Lack of Medication Adherence	25	16.4
Diabetes	19	12.5

Data Analysis Results

Preparation of the data was completed to ensure normality. Reliability was checked before any analyses were conducted to assess internal consistency of the HBM constructs referred to as subscales for the purpose of data analysis. A Cronbach's alpha (α) score of .70 and above is generally considered acceptable to indicate internal consistency of items on a scale (Field, 2013). All subscales had acceptable reliability except the subscale items for diabetes perceived susceptibility (Cronbach's $\alpha = .659$); perceived benefits regarding medication (Cronbach's $\alpha = .025$), overweight (Cronbach's $\alpha = .677$), alcohol consumption (Cronbach's $\alpha = .505$); and perceived barriers regarding medication (Cronbach's $\alpha = .675$). Results for these analyses might be a little less reliable. Due to its markedly poor reliability, a decision was made to exclude Perceived Benefits of medication adherence from the analyses. Full reliability results are presented in Table 4.

One reason for the lack of internal consistency could be that some of the subscales contained several items while others contained only a few; consequently, it is more difficult to establish reliability with fewer subscale items. Another reason for the lack of internal consistency within some of the subscales may be due to the small sample of those who engaged in or possessed the risk behavior in this study compared to prior studies (Sullivan et al., 2008; Sullivan et al., 2010) in which the CABS-R survey instrument was utilized. Oversampling is required to obtain a large enough sample size for each risk factor. In the current study, the researcher attempted to recruit as many

participants as possible; however, COVID-19 restrictions placed limitations on data collection beyond the researcher's control.

Table 4

HBM and 6-month Intention Questions with Corresponding Cronbach's alpha

HBM Subscale	Cronbach's <i>a</i>
Perceived Susceptibility	
Exercise	.848
Smoking	.933
Diabetes	.659
Medication adherence	.852
High blood pressure	.704
Overweight	.777
Alcohol consumption	.864
Perceived Severity	.902
Perceived Benefits	
Exercise	.759
Smoking	.876
Medication	.025
High blood pressure	.771
Overweight	.677
Alcohol consumption	.505
Perceived Barriers	
Exercise	.766
Smoking	.857
Diabetes	.881
Medication	.675
High blood pressure	.825
Overweight	.819
Alcohol consumption	.772
6-month Intention to Change	
Exercise	.807
Smoking	.842
Diabetes	.916
Medication	.844
High blood pressure	.881
Overweight	.850
Alcohol consumption	.898

Note: Cronbach's *a* not shown for the 1-item Perceived Benefits subscale for diabetes.

Research Questions and Results

This section addresses the research questions and the respective study findings. Research Question 1 asked if there is a difference in rural Arkansas middle-aged African American women with a family history of stroke compared to those without a family history of stroke regarding perceived stroke susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction.

Independent samples *t*-tests were conducted to explore differences in risk perception between participants with a family history of stroke and those without a family history of stroke (IVs). Mean scores for the two independent groups were compared to show if they differed on the DVs of perceived susceptibility to stroke, perceived benefits of stroke risk factor reduction, and Perceived Barriers to stroke risk factor reduction for the following risk factors: physical inactivity, smoking, diabetes, lack of medication adherence, high blood pressure, overweight, and alcohol consumption.

All tests were checked for equality of variances. Levene's tests for equality of variances demonstrated that equal variance could be assumed for all tests except perceived susceptibility for medication ($p = .041$), perceived susceptibility for high blood pressure ($p = .029$), perceived susceptibility for overweight ($p = .029$), and perceived barriers for alcohol consumption ($p = .048$) dependent variables. Based on a significance level of $p < .05$, the results of the *t*-tests indicated that there were no statistically significant differences between those with and without family histories of stroke for perceived susceptibility to stroke, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction regarding exercise, smoking, diabetes,

medication adherence, high blood pressure, overweight, and alcohol consumption.

Cohen's d was also examined to look for effect size. A Cohen's d result of $-.47$ indicated a standardized mean difference for perceived susceptibility to stroke that was $.47$ standard deviations lower in participants with diabetes and a family history of stroke compared to participants with diabetes and no family history of stroke. This was interpreted as a medium effect size, which indicated that despite there being no difference in perceived susceptibility to stroke, family history of stroke may still have some moderate effect on perception of stroke risk in participants with diabetes. A Cohen's d result of $.76$ indicated a standardized mean difference for perceived susceptibility to stroke due to lack of medication adherence that was $.76$ standard deviations higher in those with a family history of stroke compared to those with no family history of stroke. This was interpreted as a large effect size, which indicated that despite there being no difference in perceived susceptibility to stroke, family history of stroke may still have a large effect on perceived risk of stroke due to lack of medication adherence. A Cohen's d result of $-.74$ indicated a standardized mean difference for perceived barriers to stroke prevention due to lack of medication adherence that was $.74$ standard deviations lower in those with a family history of stroke compared to those with no family history of stroke. This was interpreted as a large effect size, which indicated that despite there being no difference in perceived barriers to stroke prevention, family history of stroke may still have a large effect on perception of barriers to undertaking stroke risk reduction behaviors associated with lack of medication adherence. Despite the lack of statistical significance noted earlier, the medium and large effect sizes suggest that the results could be meaningful, but the

sample was too small to obtain significance. Table 5 provides a full summary of the independent samples *t*-tests findings.

Table 5

Independent Samples t-Test Comparing Family History of Stroke on Risk Perception

Risk factor	Family history		No family history		df	t	p	d
	M	SD	M	SD				
Exercise								
Perceived susceptibility	3.17	.99	2.92	.98	139	1.49	.138	.25
Perceived benefits	2.39	.82	2.26	.75	139	.96	.337	.16
Perceived barriers	2.39	.82	2.26	.75	139	.96	.337	.16
Smoking								
Perceived susceptibility	3.10	.96	3.48	1.09	30	-1.03	.310	-.37
Perceived benefits	3.63	.79	3.35	1.12	32	.84	.409	.29
Perceived barriers	2.77	.81	2.72	1.16	28	.15	.885	.05
Diabetes								
Perceived susceptibility	3.25	.67	3.58	.71	21	-1.12	.274	-.47
Perceived benefits	4.00	.82	3.92	.79	20	.24	.811	
Perceived barriers	2.03	.97	2.02	.64	20	.02	.987	.01
Medication								
Perceived susceptibility	3.83	.73	3.11	1.18	17.15	1.86	.079	.76
Perceived barriers	1.61	.61	2.02	.45	27	-1.96	.060	-.74
High BP								
Perceived susceptibility	3.64	.72	3.39	.97	60.72	1.19	.237	.29
Perceived benefits	4.27	.55	4.01	.68	65	1.73	.088	.42
Perceived barriers	1.85	.72	1.96	.76	65	-.64	.525	-.16
Overweight								
Perceived susceptibility	3.22	.93	3.17	.80	80.62	.27	.791	.06
Perceived benefits	4.28	.57	4.06	.64	81	1.67	.099	.37
Perceived barriers	3.00	1.03	2.97	1.00	81	.14	.889	.03

Alcohol

Perceived susceptibility	2.53	.96	2.53	.85	46	.00	1.00	.00
Perceived benefits	3.71	.55	3.51	.58	46	1.21	.232	.35
Perceived barriers	2.58	.87	2.31	.60	41.06	1.25	.217	.36

Research Question 2 asked if a relationship exists between the number of personal stroke risk factors self-identified by each participant and perceived stroke severity.

A total stroke risk score variable was created to represent the cumulative number of stroke risk factors identified by participants. Pearson's product-moment correlation was conducted to examine the relationship between total stroke risk and perceived stroke severity. Results indicated that there was no statistically significant correlation between personal stroke risk factors and perceived severity of stroke ($r = .07, p = .421$). There is no support for the existence of a meaningful relationship between the two variables.

Research Question 3 asked if 6-month intention to change a set of personal stroke risk factors (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) predicts perceived stroke severity.

Hierarchical linear regression was conducted to explore the relationship among these variables. Steps were taken to ensure the model made sense by assessing if the personal stroke risk factors combined together work for predicting perceived stroke severity. Descriptive statistics were run for each variable to check sample size. Diabetes, medication adherence, smoking, and alcohol consumption were excluded from the analysis because they made the sample too small for the model. Hierarchical linear

regression analyses were run with the following remaining variables: exercise, overweight, and high blood pressure. Results revealed that for exercise, $F(1, 43) < .01$, $p = .970$, $R^2 < .01$, the regression model did not significantly predict perceived stroke severity. For the combination of exercise and overweight, $F(2, 42) < .01$, $p = .996$, $R^2 < .01$, the regression model did not significantly predict perceived stroke severity. For all three predictors (exercise, overweight, high blood pressure), $F(3, 41) = .07$, $p = .976$, $R^2 < .01$, the regression model did not significantly predict perceived stroke severity. These results indicate that none of the independent variables in the model shared meaningful relationships with the dependent variable. Therefore, the hypothesis was confirmed; and no further analysis was warranted. Results of the study on the null hypotheses are summarized in Table 6.

Table 6

Null Hypotheses Summary: Rejected or Not Rejected

Null Hypotheses	Rejected or Not Rejected
1. There will be no statistically significant difference in rural Arkansas middle-aged African American women with a family history of stroke compared to those without a family history of stroke regarding perceived susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction.	
<i>Physical inactivity</i>	
Perceived susceptibility	Not rejected
Perceived benefits	Not rejected
Perceived barriers	Not rejected

Null Hypotheses	Rejected or Not Rejected
<i>Smoking</i>	
Perceived susceptibility	Not rejected
Perceived benefits	Not rejected
Perceived barriers	Not rejected
<i>Diabetes</i>	
Perceived susceptibility	Not rejected
Perceived benefits	Not rejected
Perceived barriers	Not rejected
<i>Lack of medication adherence</i>	
Perceived susceptibility	Not rejected
Perceived benefits	Not rejected
Perceived barriers	Not rejected
<i>High blood pressure</i>	
Perceived susceptibility	Not rejected
Perceived benefits	Not rejected
Perceived barriers	Not rejected
<i>Overweight</i>	
Perceived susceptibility	Not rejected
Perceived benefits	Not rejected
Perceived barriers	Not rejected
<i>Alcohol</i>	
Perceived susceptibility	Not rejected
Perceived benefits	Not rejected
Perceived barriers	Not rejected
2. There will be no statistically significant relationship between the number of personal stroke risk factors in rural Arkansas middle-aged African American women (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) and their perceived stroke severity.	
<i>Total stroke risk</i>	Not rejected

Null Hypotheses	Rejected or Not Rejected
3. Six-month intention to change a set of personal stroke risk factors (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) will not significantly predict perceived stroke severity among middle-aged African American women residing in rural Arkansas.	
<i>Exercise 6-month intention</i>	Not rejected
<i>Overweight 6-month intention</i>	Not rejected
<i>High blood pressure 6-month intention</i>	Not rejected

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this quantitative study was to examine factors that influence stroke risk perception among African American women aged 35-54 residing in rural Arkansas using an expanded HBM. Primary data was collected by the researcher using the CABS-R survey instrument for the purpose of exploring whether (a) family history of stroke affects risk perception, (b) there is an association between personal stroke risk factors and risk perception, and (c) whether 6-month intention to change risk factors is predictive of perceived threat of stroke. The initial portion of the survey consisted of 27 questions pertaining to demographics, stroke history, health conditions, and health behaviors. Part 2 of the survey contained Likert scale questions based on expanded HBM that examined participants' perception of stroke risk and intention to change risk behaviors. The final portion of the survey consisted of 19 questions to assess stroke knowledge.

Research Questions and Hypotheses

The following discussion focuses on the study findings as they relate to the research questions and hypotheses. There were three research questions addressed in the study.

Research Question 1: Is there a difference in rural Arkansas middle-aged African American women with a family history of stroke compared to those without a family

history of stroke regarding perceived stroke susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction?

Kulshreshtha et al. (2015), Chung et al. (2016), and Ellis et al. (2019) described the significant role that family history represents in overall cardiovascular health. Aycock and Clark (2016) and Aycock et al. (2015) identified the importance of examining the association between family history and stroke as well as the impact family history has on risk perception. The CABS-R survey instrument used in this study allowed for the warranted exploration of the relationship between family history of stroke and risk perception based on the HBM constructs.

The literature is mixed regarding risk perception among those with a family history of a health condition compared to those without a family history of the condition. Some studies have indicated that individuals with a family history of a health condition tend to have a higher level of perceived risk of developing the condition (Aycock et al., 2015; Vornanen et al., 2016), while other studies revealed that those with a family history of disease underestimate their risk when compared to participants without a family history (Acheson et al., 2010; Brawarsky et al., 2018; Diaz et al., 2012; Wang et al., 2012). In the current study, no statistically significant differences in risk perception were identified between participants with a family history of stroke and those without a family history of stroke. These results more closely align with the findings of a literature review by Imes and Lewis (2014), which demonstrated that the underlying assumption of an association between family history and increased risk perception is not always validated. The current study affirms that being able to identify family members who have

experienced cardiovascular events does not specifically equate to being aware of and acknowledging personal risk.

The first research question in this study provided the basis for the following hypothesis: Hypothesis 1: There will be no statistically significant difference in rural Arkansas middle-aged African American women with a family history of stroke compared to those without a family history of stroke regarding perceived stroke susceptibility, perceived benefits of stroke risk factor reduction, and perceived barriers to stroke risk factor reduction.

The results of the seven independent samples *t*-tests revealed no statistically significant difference in risk perception in rural Arkansas middle-aged African American women with and without family histories of stroke; therefore, the null hypothesis was not rejected. Physical inactivity was the only variable in the study that was adequately powered for the *t*-tests to accurately reveal if a difference existed. The medium and large effect sizes detected for physical inactivity and lack of medication adherence emphasizes that more definitive results might be obtained by reexamining this research question in a larger rural population sample.

Research Question 2: Are the number of personal stroke risk factors in rural Arkansas middle-aged African American women (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) related to perceived stroke severity?

African American women possess a higher number of stroke risk factors than other population groups. For example, African American women have high self-reported

rates of smoking, inadequate physical activity levels, and poor diet (ACOG, 2014; Ford et al., 2009). Additionally, more than 50% of African American women are obese (Hales et al., 2017). The USDHHS Office of Minority Health (2019) estimated that four out of five (80.6%) African American women are overweight or obese. Further, a sizable number of African American women have high blood pressure, diabetes, and high cholesterol (CDC, n.d.c). Such risk factors are compounded among African American women who reside in the rural south (Abbott & Slate, 2018; Miller & Vasan, 2020). These findings served as the foundation for Research Question 2 due to the need to examine whether rural African American women in Central Arkansas perceived that the number of risk factors they possessed placed them at risk for stroke. The results of the current study indicated there was no statistically significant correlation between personal stroke risk factors and perceived stroke severity among study participants. These results align with the findings of the study by Aycock and Clark (2016) that revealed incongruence between the prevalence of stroke risk factors among rural African American women and perception about future stroke. In addition, Helou et al. (2018) examined accuracies in perceived versus actual risk of stroke, and findings indicated an underestimation of cardiovascular risk. In another study, Vornanen et al. (2016) found evidence of stronger perceived risk for diseases that are viewed as inheritable (e.g., cancer and diabetes) compared to risk factors viewed specifically as behavioral with no link to genetics. Research by Booth et al. (2019) demonstrated that African Americans are less likely than whites to maintain optimal health behaviors and health biometrics until age 50, thus underscoring the importance of the current study targeting African American women aged 35-54.

Moreover, the current study adds to the knowledge base as it is the first study specifically investigating perceived stroke severity based on cumulative stroke risk in rural middle-aged African American women in Arkansas. This study also adds to the body of work indicating the continued need to address stroke risk perception in rural African American women as a means of bringing perceived risk more in alignment with actual stroke risk.

Hypothesis 2: There will be no statistically significant relationship between the number of personal stroke risk factors in rural Arkansas middle-aged African American women (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) and perceived stroke severity.

The result of Pearson's correlation analysis indicated that there was no statistically significant correlation between the number of personal stroke risk factors and perceived stroke severity. Based on this finding, the null hypothesis was not rejected. It is important to note that due to the small sample size for some risk factors, the research findings may not portray an accurate picture of the relationship between the number of personal stroke risk factors and perceived stroke severity among rural African American women. The sample size for women who were overweight was affected when the height and weight measurements provided by participants indicated a clinical overweight status but was not identified as such on the survey. Instances in which African American women underestimate their weight and associated health risk is a common occurrence. Moore et al. (2010) examined African American women's perception of health risk relative to their weight category and found that overweight and obese women underestimate their weight categories. Furthermore, findings indicated that overweight

women perceived the same risk of weight-related health conditions as normal-weight women (Moore et al., 2010). Baruth et al. (2015) explored body size perceptions in overweight and obese economically disadvantaged African American women and found that 60% of participants thought they were smaller than the body size they believed corresponded with health problems. These issues should be considered in future studies.

Research Question 3: Does six-month intention to change a set of personal stroke risk factors (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) predict perceived stroke severity among middle-aged African American women residing in rural Arkansas?

Six-month intention to change pertains to people who plan to alter an unhealthy behavior or initiate a healthy behavior in the foreseeable future (the next 6 months). Six-month intention to change aligns with the contemplation stage of the transtheoretical model (TTM). This intention is predicated on awareness that a behavior is problematic and increases the chance of, but does not guarantee, healthy behavior change (Prochaska et al., 2015). Six-month intention to change was a subscale on the previously validated CABS-R survey instrument used in this study and therefore is the premise of the independent variables for this research question. There is not much research that aligns with the current study's focus on 6-month intention. Sheeran et al. (2014) identified perceived severity as one of four elements of risk appraisal and determined that heightening risk appraisal increases potential for health interventions to change intentions and behavior. Other studies have explored the impact of knowledge on or as a predictor

of risk perception (Brawarsky et al., 2018; Dearborn & McCullough, 2009; Geraee et al., 2015; Sharrief et al., 2016) or behavior change (Arlinghaus & Johnston, 2018; Ferrer & Klein, 2015; Lacey & Street, 2017), but the researcher is not aware of any prior studies that examined whether 6-month intention to change stroke risk factors predicts perceived stroke severity. A primary aim of this study was to examine the extent to which intention to change risk behaviors in the near future is indicative of perceived threat. The hierarchical linear regression conducted in the current study indicated that 6-month intention to change inadequate exercise, overweight, and high blood pressure did not, collectively or individually, predict perceived stroke severity. Diabetes, smoking, lack of medication adherence, and alcohol consumption were excluded due to lack of overlap with the other variables, which would have made the sample too small for adequate analysis.

Hypothesis 3: Six-month intention to change a set of personal stroke risk factors (physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption) will not significantly predict perceived stroke severity among middle-aged African American women residing in rural Arkansas.

In this study, the hierarchical linear regression analysis indicated that 6-month intention to change physical inactivity, smoking, high blood pressure, diabetes, lack of medication adherence, overweight, and alcohol consumption did not significantly predict perceived stroke severity. Based on this finding, the null hypothesis was confirmed for the variables included in the analysis (inadequate exercise, overweight, high blood pressure). Only inadequate exercise met the number of participants required for the

power analysis. Because the remaining risk variables were underpowered, the research findings may not portray an accurate picture of whether 6-month intention to change specific risk factors predicts perceived stroke severity among the target population. Achieving a larger sample for each risk variable required oversampling in the target population, which was not possible due to restrictions associated with COVID-19.

Limitations

Limitations of this study should be considered when evaluating the findings. A limitation of this study is that it specifically targets stroke risk and risk perception in middle-aged African American women residing in rural Phillips County, Arkansas; therefore, results may not be generalizable to women who do not meet this eligibility criteria. Similarly, recruitment of women solely from a rural Arkansas county with high stroke mortality may not yield a sample that is representative of all rural counties. Phillips County residents have one of the highest rates of cardiovascular risk factors and the lowest life expectancy in the state (County Health Rankings, 2019), so results may not translate to rural communities that do not possess similar health statistics. Additionally, 52% of study participants had a bachelor degree or higher, compared to 15.9% of the Phillips County population as a whole. Thus, the results of this study may not be reflective of health literacy levels of other county residents. Moreover, ability to generalize results to non-rural communities would be moderately limited.

Another limitation involves the length of the CABS-R survey instrument, which may have resulted in discontinuation of survey completion by some participants, failure to answer some survey items, or the submission of uniform responses to subscale

questions to decrease time required to complete the full instrument. Average survey completion time was 25-30 min, which might have been viewed as excessive by some study participants. Revilla and Ochoa (2017) concluded that ideal survey length should allow for completion within 10-20 min. The researcher used the survey instrument in its original format with the exclusion of one item that was specific to the population for which the survey was originally created. Additionally, during face-to-face administration of the survey, some participants requested the researcher to clarify a couple of the questions; for example, “What is a transient ischemic attack (TIA)?” Although this issue did not occur during the pilot testing of the instrument, it may have affected some of the participant responses in the study.

Another limitation of the study was the digital divide between urban and rural communities. In addition to paper-and-pencil format, the survey instrument was offered in an online format via a Qualtrics survey link. The link could be opened on a desktop, laptop, or mobile device; however, less than one-third of participants completed the survey online. This development could be attributed to lack of comfort using technology that is not commonly available in rural communities or decreased digital adoption and usage resulting from lower education levels and skills in rural areas (Salemink et al., 2017). The digital inaccessibility in rural regions also poses a barrier to essential health care options, such as telehealth (Probst & Ajmal, 2019; Rhoads & Rakes, 2020). These factors should be taken into consideration in future studies conducted in rural settings.

The emergence of the COVID-19 pandemic resulted in the shutdown of face-to-face activities that were intended sources of data collection (e.g., health coaching classes

and community health fair events). Online survey administration was the sole means of data collection until face-to-face events were resumed.

This study also had strengths. For example, this study filled a noticeable gap in the literature regarding African American women under 55 who have long been underrepresented in research. As part of this research, the author gained valuable insight into the ability of rural Arkansas middle-aged African American women to accurately identify personal stroke risk factors. Study results contribute to the broader understanding of stroke risk factor prevalence and stroke risk perception in rural middle-aged African American women, which is essential to the success of educational and behavioral interventions targeting risk factors and risk reduction behaviors among this population.

Implications of the Study

The availability of current literature specifically targeting rural middle-aged African American women is sparse. Furthermore, the literature is mixed regarding the association between stroke risk factors, stroke risk perception, and intention to change risk factors within this population. A study by Warren et al. (2016) revealed greater motivation and intention to lose weight among rural African American women compared to their white counterparts. This is in contrast to other studies indicating that rural African American women do not consistently recognize excess weight status as a risk factor and subsequently do not initiate behavior change (Brawarsky, 2018; James et al., 2012; Moore et al., 2010). The current study is important because it augments the sparse existing body of research involving rural middle-aged African American women and sheds additional light on their persistent health risk as a result of the incongruity between

perceived and actual health threat. Additionally, findings from the present study can help inform the development of culturally-tailored interventions and resources that health educators and other health professionals can use to increase stroke risk factor awareness and promote healthy behavior change among similar groups of African American women and other rural populations.

For primary data collection to be successful, particularly in ethnic minority communities, access to, acceptance by, and cooperation from the priority population is essential (Awad et al., 2016). In the current/present study, the researcher facilitated this process by working with stakeholders in the community to gain access to and acceptance by the rural Arkansas middle-aged African American from whom data was collected. This precluded some of the distrust and challenges researchers may encounter when working with rural populations (Murry & Brody, 2004). Participants seemed more accepting of the researcher because the researcher was the same age and race as the target population. Findings from a systematic review of qualitative and quantitative studies by George et al. (2014) identified a similar recruitment benefit wherein participants prefer being recruited in their own community by research personnel who are culturally matched. One participant specifically commented, “I am glad someone cares enough about us to find out if we are taking care of ourselves.” The relationships the researcher developed with participants led to an unplanned snowball sampling effect in which participants shared information about the study with other women in the community who met the study criteria; multiple women participated in the study as a result. The trust-building process that evolved in the current study provides an example that can be used

by other researchers seeking to gain access to rural communities for research and program implementation purposes.

Implications for Health Educators

This study is significant for health educators in the planning and development of health education interventions and resources to reduce stroke risk factors, as well as stroke incidence and mortality among African American women, particularly those living in rural areas. The current study also connects with the Areas of Responsibilities for Certified Health Education Specialists as defined by the National Commission for Health Education Credentialing (NCHEC, 2020). The Eight Areas of Responsibilities, along with competencies and sub-competencies, outline roles to be carried out by Certified Health Education Specialists. The Eight Areas of Responsibility are:

- Area I: Assessment of Needs and Capacity
- Area II: Planning
- Area III: Implementation
- Area IV: Evaluation and Research
- Area V: Advocacy
- Area VI: Communication
- Area VII: Leadership and Management
- Area VIII: Ethics and Professionalism

(NCHEC, 2020, para. 6)

The current study aligns with multiple NCHEC Areas of Responsibility. As part of the needs assessment process (Area I), the results of the study can help health

educators identify social, cultural, political, and environmental factors that impact the health of the priority population. Based on the current study, the researcher determined that primary data collection was the best and most informative method for connecting with the priority population and gathering meaningful data regarding stroke risk factors, health behaviors, and perceptions. From this study, health educators can see the importance of employing a data collection method that best fits the purpose of the study. Based on primary data gathered from participants in this study, the researcher gained insight into stroke risk factor prevalence affecting the health status of the priority population. Health educators must be aware that such information is crucial when planning and developing targeted health education and promotion interventions. The study also informs health educators on the importance of working with community stakeholders to gain access to and the trust of communities that have historically been more difficult to reach (Armstrong et al., 2007; Hall et al., 2018). Establishing communication with the target audience is a primary responsibility of health educators. In this study, collaboration with stakeholders helped facilitate communication building with the priority population. The current study revealed that face-to-face communication is often preferred by rural audiences targeted for health interventions. Health educators seeking to implement health behavior change programs for stroke risk factor reduction in rural communities should recognize that technological sources of communication are often scarce (Real et al., 2014; Saleminck et al., 2017), and they should tailor the intervention to the means available for program delivery.

Health educators should also possess the capacity to identify or develop an instrument that will be most appropriate for data collection. Pilot testing an instrument with a sample that represents the priority population can lead to insights on question clarity and appropriateness of survey length. This is also a point at which health literacy levels can be assessed to determine if the accuracy of responses provided might be impacted. A higher percentage of participants in this study possessed a bachelor's degree or higher compared to the county's general population. The pilot test in this study did not indicate the need for a cognitive evaluation prior to survey administration; however, health educators should take steps prior to data collection to ensure such an assessment is not warranted. For this study, the CABS-R survey instrument was used to assess the knowledge, attitudes, beliefs, and behaviors regarding stroke in the priority population. This reveals to health educators the importance of obtaining data that accurately captures the context of research questions. Moreover, the current study conveys the importance of health educators examining evidence-informed findings to determine what areas to target with health promotion interventions.

Mensah (2018) emphasized that health is “supported and protected or risked and damaged,” based on characteristics of a community setting (p. S38). Findings from this study accentuate the need to focus more research on rural African American women, particularly those at risk for stroke due to family history, high blood pressure, obesity, and inadequate physical activity. Paige et al. (2018) asserted that adequate knowledge of risk factors helps shape threat perception and promotes engagement in protective health behaviors. By working with rural African American women to improve their accuracy of

risk factor identification, health educators can increase the chances that members of this population will recognize their actual susceptibility to stroke and the seriousness of its consequences and subsequently trigger risk reduction behaviors. Health educators are in a principal position to reduce stroke prevalence via delivery of health education and promotion programs developed based on the knowledge, public trust, and skills they possess. Findings from a study by Jeihooni et al. (2018) revealed that implementation of an education program based on the HBM resulted in meaningful enhancement of disease knowledge, perceived threat, perceived benefits, and perceived self-efficacy, while also decreasing perceived barriers to preventive behaviors. Results of the current study can be used to develop an HBM-based stroke education program to promote increased stroke knowledge, threat perception, and perceived benefits of reducing stroke risk, as well as provide cues to action and increase self-efficacy regarding behavior modification. In many instances, introducing a health intervention into a rural community requires interdisciplinary collaboration via established relationships between health educators and key stakeholders. In this study, stakeholders were involved throughout the recruitment and data collection processes. The result of such collaboration can enhance development, implementation, and evaluation of quality content to ensure that stroke health education programs and health communication are educationally sound, culturally competent, and culturally sensitive (Harvey & Afful, 2011). Essentially, health educators must recognize that culture is a part of everyday life and should be incorporated at every step of the program planning and development process. The culture associated with churches is unrivaled in its influence within the African American community. A study by Rowland

and Isaac-Savage (2014) revealed that numerous African American pastors reported providing some form of health education and/or health screening opportunities for their congregants. Whitt-Glover et al. (2016) reinforced that the central role of churches in the African American community makes the church an ideal source for recruitment and health promotion program delivery. As such, health educators should be intentional about collaborating with African American church leaders when developing and delivering health education programs. Additionally, results of this study can be used to advocate for health, health education, and healthcare accessibility policies in rural communities that can lead to increased awareness of stroke risk factors and stroke prevention. Findings from this study can further be used as the basis for persuasive messages and materials to support policy, environmental, and system changes inherent in the advocacy efforts needed to reduce stroke morbidity and mortality in rural communities.

Implications for Other Health Professionals

Stroke in young and middle-aged adults is a growing public health issue (Jolly et al., 2010; Kalinowski et al., 2019; Yahya et al., 2020). Stroke is the third leading cause of death among African American women, and they are more likely to die from stroke than white and Hispanic women (CDC, n.d.b). Additionally, rural African Americans are exceedingly vulnerable (Davis et al., 2014; Ellis et al., 2019). Results from this study indicated primary ways in which health care and other health professionals can help to decrease stroke risk in rural African American women are by facilitating increased stroke risk factor awareness and emphasizing the importance of risk reduction behaviors.

The current study revealed that many participants had multiple stroke risk factors such as being overweight, high blood pressure, alcohol consumption, and smoking. This finding is supported by the results of a systematic review by Sakakibara et al. (2017) that revealed it is common for individuals who smoke to have multiple unhealthy lifestyle behaviors, such as unhealthy diet, insufficient physical activity, and alcohol consumption. Physicians and/or physician assistants (PAs) working with rural African American women can tailor education information and prioritize education efforts that will increase stroke risk factor knowledge and awareness in this population. Inconsistencies in participants' ability to recognize overweight status was also revealed in this study. Squiers et al. (2014) suggested that physicians "are in an excellent position to help align patients' weight perception with their actual BMI" (p. 807). Physicians, PAs, and nurse practitioners can ensure that education efforts include BMI guidelines and stroke risk associated with overweight and obese status. Furthermore, health and medical professionals can educate patients on recommended physical activity guidelines and discuss personal health risks associated with alcohol consumption. It is also important to note that risk factor knowledge is associated with risk perception. A review by Aycock et al. (2019) concluded that by assessing perceived stroke risk, more can be learned about an individual's thoughts and knowledge about stroke risk. This type of assessment can inform the development of targeted education strategies to minimize differences in perceived and actual stroke risk and increase the chance that risk reduction behaviors will be implemented.

Overweight and obese status are notable risk factors for stroke. The current study revealed that 59.2% of participants were overweight, which may be partly attributed to the documented frequency of poor dietary history among rural residents (Trivedi et al., 2015). Registered dietitian nutritionists (RDNs) can help promote weight loss among at-risk individuals by educating them on the importance of making dietary changes and teaching them healthy eating and meal preparation strategies. The Academy of Nutrition and Dietetics asserts that medical nutrition therapy (MNT), administered by RDNs, is an effective intervention for individuals with pre-diabetes or type 2 diabetes and should be integrated into public health programs (Early & Stanley, 2018). RDNs can play a key role in stroke prevention by educating clients and providing resources that reinforce the association between weight loss and stroke risk reduction. In addition, RDNs can help reduce stroke risk by employing MNT to promote weight loss and reduce high blood pressure among at-risk rural African Americans. Access to healthy food options is another barrier that must be addressed to help facilitate weight loss. Rural southern residents are four times less likely to have access to healthy food retailers compared to their urban counterparts (Edwards et al., 2011; Grimm et al., 2013). Therefore, RDNs can educate rural residents on healthy food options and help them locate these foods from farmers markets, local gardens, or other options available within their community environment.

This study revealed that rural residents are often most comfortable working with individuals with whom they feel they can relate and trust. Community health workers (CHW) generally are trusted community members who have a thorough understanding of

the community they serve (Schroeder et al., 2018). Community health workers can work with health educators on the development and delivery of stroke risk reduction programs, which can help increase dissemination and uptake of health programming initiatives. This study also revealed that health coaching classes were a significant source of education delivery in the priority population. CHWs can utilize their relationship with community residents to encourage attendance at health coaching classes. Chances of sustained participant attendance in health coaching classes could be improved if CHWs were also active in helping to deliver the class content. These health coaching classes also point to the positive impact that certified health and wellness coaches can have in terms of fostering healthy lifestyle behaviors and helping individuals “mobilize internal strengths and external resources for sustainable change” (Moore et al., 2016, p. 2). As Kivelä et al. (2014) revealed in their systematic review, health coaching can assist individuals with weight management and lead to increased physical activity and improved physical and mental health status. Furthermore, certified health and wellness coaches are increasingly viewed as an important component of the interprofessional lifestyle medicine team (Arloski, 2014; Frates et al., 2019; Moore et al., 2016). Certified health and wellness coaches can work collaboratively with health educators, physicians and/or PAs, RDNs, and CHWs to raise stroke awareness among rural African American women through health education, coaching, programming, and health communication messages. The results of such collaborative efforts can tip the scales so that perceived benefits of changing risk behaviors outweigh perceived barriers.

Recommendations for Future Research

Future research opportunities examining stroke prevention are numerous, and findings from this study offer direction for research promoting prevention of stroke among rural African American women. Recommendations for research related to improving the accuracy of stroke risk factor identification, reinforcing the significance of family history in stroke risk, and the importance of increasing risk perception in relation to risk factor prevalence will be discussed.

Participants in this study possessed a significant number of risk factors. Study results reflected that 62.5% of participants identified inadequate levels of exercise, 59.2% identified as being overweight, 48% had been diagnosed with high blood pressure, and 44.7% of rural Arkansas middle-aged African American women had a family history of stroke. Numerous participants did not possess knowledge of risk factor criteria; therefore, ability to accurately identify risk factors was hampered. One such instance involves participants whose self-reported height and weight listings did not align with designation of being overweight in their survey response. This finding is consistent with other studies examining accuracy of overweight and obese status based on self-report versus body measurement (Gregory et al., 2008; Robinson, 2017; Sutcliffe et al., 2015). Further studies may improve accuracy of stroke risk factor identification by incorporating an educational component that informs participants of modifiable risk factor criteria (i.e., BMI, blood pressure, adequate exercise levels) and by assessing ability to comprehend the information prior to surveying participants as part of the study.

Familial predisposition to cardiovascular disease (CVD) is a noted risk factor for stroke (CDC, n.d.d; Imes & Lewis, 2014). Research indicates a higher incidence of high blood pressure and overweight in individuals with a family history of these risk factors (Vik et al., 2016). Findings from the Framingham Heart Study revealed that family history of CVD in at least one parent increases general CVD risk among women by 70% (Allport et al., 2016; Imes & Lewis, 2014; Kolber & Scrimshaw, 2014), while a history of stroke in a first-degree relative increases stroke risk by approximately 12% (American Heart Association, 2019; Pourasgari & Mohamadkhani, 2020). Results of the current study indicated that stroke threat perception in rural African American women did not differ between those with and without family histories of stroke. This mimics the findings of a previous study by Lucas-Wright et al. (2014), which showed that African Americans are less likely than other racial/ethnic groups to perceive increased risk due to family history. Wang et al. (2012) theorized that increasing awareness of the elevated risk of disease based on family history will inspire engagement in protective, risk-reducing behaviors. Combined with the findings of the current study, this assumption suggests that future research is needed to determine whether targeted educational interventions can increase knowledge regarding the significance of family history in stroke risk and stimulate a level of risk perception that leads to risk reduction behaviors.

Multiple studies have examined whether perceived risk predicts behavioral intention (Alzaman et al., 2013; Imes & Lewis, 2014; Sheeran et al., 2014); however, this is the first study the researcher is aware of that investigated whether 6-month intention to change a group of risk factors is predictive of threat perception. Results from this study

indicated that intention to undertake risk reduction behaviors does not predict threat perception. The quantitative study format did not lend itself to in-depth exploration of how and why participants determine the need for behavior change if they do not perceive the threat of a health event as personally relevant. Because participants preferred face-to-face data collection methods in the current study, conducting a focus group could provide a future research avenue to explore the psychological factors that underlie risk perception and behavioral intention. Studies that involve the development of interventions that incorporate the personal, behavioral, and environmental triadic of the social cognitive theory (Kelder et al., 2015; McKenzie et al., 2016) could also help identify personal and environmental influences on perceived threat and move participants towards sustainable behavior change.

Conclusions

Stroke is a life-altering health event that is largely preventable. According to this study of rural Arkansas middle-aged African American women, there is variable ability to accurately identify stroke risk factors. Neither family history of stroke nor an accumulation of personal stroke risk factors influenced risk perception among the study population. Additionally, 6-month intention to change a set of stroke risk factors did not predict perceived severity of stroke. There is a need for increased education regarding stroke risk factor parameters to improve stroke knowledge and increase accuracy of risk factor identification. Such efforts have the potential to bridge the gap between perceived versus actual risk and stimulate essential risk reduction behaviors in this high-risk population.

REFERENCES

- Abbott, L. S., & Slate, E. H. (2018). Improving cardiovascular disease knowledge among rural participants: The results of a cluster randomized trial. *Healthcare (Basel, Switzerland)*, 6(3), 71. <https://doi.org/10.3390/healthcare6030071>
- Acheson, L. S., Wang, C., Zyzanski, A. L., Ruffin, M. T., Gramling, R., Rubinstein, W. S., O'Neill, S. M., Nease, D. E., & Family Healthware Impact Trial Group. (2010). Family history and perceptions about risk and prevention for chronic diseases in primary care: A report from the Family Healthware Impact Trial. *Genetics in Medicine*, 12(4), 212–218. <https://doi.org/10.1097/GIM.0b013e3181d56ae6>
- Adams, R. J., Piantadosi, C., Ettridge, K., Miller, C., Wilson, C., Tucker, G., & Hill, C. L. (2013). Functional health literacy mediates the relationship between socio-economic status, perceptions and lifestyle behaviors related to cancer risk in an Australian population. *Patient Education and Counseling*, 91(2), 206–212. <https://doi.org/10.1016/j.pec.2012.12.001>
- Alharbi, A. S., Alhayan, M. S., Alnami, S. K., Traad, R. S., Aldawsari, M. A., Alharbi, S. A., Al Sharif, A. O., Alboqami, S. T., Alshammari, S. A., Alzeer, M. K. S., & Alshammari, M. S. (2019). Epidemiology and risk factors for stroke. *Archives of Pharmacy Practice*, 10(4), 60–66.
- Allport, S. A., Kikah, N., Saif, N. A., Ekokobe, F., & Atem, F. D. (2016). Parental age of onset of cardiovascular disease as a predictor of offspring age of onset of

cardiovascular disease. *PLoS ONE*, 11(12), 1–12.

<https://doi.org/10.1371/journal.pone.0163334>

Alreck, P. L., & Settle, R. B. (2004). *The survey research handbook* (3rd ed.). McGraw-Hill/Irwin.

Alzaman, N., Wartak, S. A., Friderici, J., & Rothberg, M. B. (2013). Effect of patients' awareness of CVD risk factors on health-related behaviors. *Southern Medical Journal*, 106(11), 606–609. <https://doi.org/10.1097/SMJ.0000000000000013>

American College of Cardiology. (2018). *Women face worse outcomes after stroke, study finds*. <https://www.cardiosmart.org/News-and-Events/2018/02/Women-Face-Worse-Outcomes-After-Stroke-Study-Finds>

American College of Obstetricians and Gynecologists. (2014). *Health disparities in rural women*. <https://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Health-Care-for-Underserved-Women/Health-Disparities-in-Rural-Women>

American Council on Science and Health. (2017). *Top 10 causes of death aren't same for men and women*. <https://www.acsh.org/news/2017/04/20/top-10-causes-death-arent-same-men-and-women-11169>

American Heart Association. (2014). *African Americans and stroke*. <http://powertoendstroke.org/stroke-african-americans.html>

American Heart Association. (2019). *2019 stroke fact sheet*. <https://www.stroke.org/-/media/stroke-files/about-us/asm/general-asm-resources/2019-stroke-fact-sheet-->

approved.pdf?la=en&hash=4722D6AE8F431C78B8546921CA18ADA6C79783F

0

American Heart Association. (2021). *Black young adults face higher stroke risk than their white peers*. <https://www.heart.org/en/news/2021/03/29/black-young-adults-face-higher-stroke-risk-than-their-white-peers>

American Stroke Association. (n.d.). *About stroke*. <https://www.stroke.org/en/about-stroke>

American Stroke Association. (2016). *Impact of stroke (stroke statistics)*.
http://www.strokeassociation.org/STROKEORG/AboutStroke/Impact-of-Stroke-Stroke-statistics_UCM_310728_Article.jsp#.W0wVUdVKipo

American Stroke Association. (2018). *Types of stroke*.
https://www.strokeassociation.org/STROKEORG/AboutStroke/TypesofStroke/Types-of-Stroke_UCM_308531_SubHomePage.jsp

American Stroke Association. (2019a). *Hemiparesis*. <https://www.stroke.org/en/about-stroke/effects-of-stroke/physical-effects-of-stroke/physical-impact/hemiparesis>

American Stroke Association. (2019b). *What is a TIA*.
<https://www.strokeassociation.org/en/about-stroke/types-of-stroke/tia-transient-ischemic-attack/what-is-a-tia>

American Stroke Association. (2019c). *Stroke risk factors not within your control*.
<https://www.stroke.org/en/about-stroke/stroke-risk-factors/stroke-risk-factors-not-within-your-control>

American Stroke Association. (2019d). *Effects of stroke*. <https://www.heart.org/en/about-stroke/effects-of-stroke>

American Stroke Association. (2019e). *Risk factors under your control*.
<https://www.stroke.org/en/about-stroke/stroke-risk-factors/risk-factors-under-your-control>

American Stroke Association. (2020). *Stroke risk factors you can control, treat and improve*. <https://www.stroke.org/en/about-stroke/stroke-risk-factors/stroke-risk-factors-you-can-control-treat-and-improve>

Andersen, K. K., Olsen, T. S., Dehlendorff, C., & Kammersgaard, L. P. (2009). Hemorrhagic and ischemic strokes compared: Stroke severity, mortality, and risk factors. *Stroke*, 40, 2068–2072.
<https://doi.org/10.1161/STROKEAHA.108.540112>

Anderson, R. T., Camacho, F., Iaconi, A. I., Tegeler, C. H., & Balkrishnan, R. (2011). Enhancing the effectiveness of community stroke risk screening: A randomized controlled trial. *Journal of Stroke and Cerebrovascular Diseases*, 20(4), 330–335.
<https://doi.org/10.1016/j.strokecerebrovasdis.2010.02.002>

Appel, S. J., Giger, J. N., & Davidhizar, R. E. (2005). Opportunity cost: The impact of contextual risk factors on the cardiovascular health of low-income rural southern African American women. *Journal of Cardiovascular Nursing*, 20(5), 315–324.
<http://ezproxy.twu.edu:2339/ehost/pdfviewer/pdfviewer?sid=ec81705b-d12c-4729-8c01-8e87b6462e5b%40sessionmgr4001&vid=2&hid=4104>

- Appelros, P., Stegmayr, B., & Terént, A. (2009). Sex differences in stroke epidemiology: A systematic review. *Stroke*, 40, 1082–1090.
<https://doi.org/10.1161/STROKEAHA.108.540781>
- Arlinghaus, K. R., & Johnston, C. A. (2018). Advocating for behavior change with education. *American Journal of Lifestyle Medicine*, 12(2), 113–116.
<https://doi.org/10.1177/1559827617745479>
- Arloski, M. (2014). *Wellness coaching for lasting lifestyle change*. Whole Person Associates.
- Armstrong, K., Ravenell, S., Murphy, S., & Putt, M. (2007). Racial/ethnic differences in distrust in the United States. *American Journal of Public Health*, 97(7), 1283–1289. <https://doi.org/10.2105/AJPH.2005.080762>
- Association of American Medical Colleges. (2017). *Health disparities affect millions in rural U.S. communities*. <https://news.aamc.org/patient-care/article/health-disparities-affect-millions-rural-us-commun/>
- Awad, G. H., Patall, E. A., Rackley, K. R., & Reilly, E. D. (2016). Recommendations for culturally sensitive research methods. *Journal of Educational and Psychological Consultation*, 26(3), 283–303. <https://doi.org/10.1080/10474412.2015.1046600>
- Aycock, D. M., Clark, P. C., & Araya, S. (2019). Measurement and outcomes of the perceived risk of stroke: A review. *Western Journal of Nursing Research*, 41(91), 134–154. <https://doi.org/10.1177/0193945917747856>

Aycock, D. M., & Clark, P. C. (2016). Incongruence between perceived long-term risk and actual risk of stroke in rural African Americans. *Journal of Neuroscience Nursing*, 48(1), 35–41. <https://doi.org/10.1097/JNN0000000000000180>

Aycock, D. M., Kirkendoll, K. D., Coleman, K. C., Clark, P. C., Albright, K. C., & Alexandrov, A. W. (2015). Family history of stroke among African Americans and its association with risk factors, knowledge, perceptions, and exercise. *Journal of Cardiovascular Nursing*, 30(2), E1–E6. <https://doi.org/10.1097/JCN.0000000000000125>

Aycock, D. M. (2012). *Risk factors for stroke in rural African Americans and factors that influence exercise behaviors to reduce stroke risk* [Doctoral dissertation, The University of Alabama at Birmingham]. ProQuest. <https://www.proquest.com/docview/1081987334?pq-origsite=gscholar&fromopenview=true>

Banks, A. D., & Dracup, K. (2007). Are there gender differences in the reasons why African Americans delay in seeking medical help for symptoms of an acute myocardial infarction? *Ethnicity & Disease*, 17, 221–227.

Baruth, M., Sharpe, P. A., Magwood, G., Wilcox, S., & Schlaff, R. A. (2015). Body size perceptions among African Americans. *Ethnicity & Disease*, 25(4), 391–398. <https://doi.org/10.18865/ed.25.4.391>

Beal, C. C. (2014). Stroke education needs of African American women. *Public Health Nursing*, 32(1), 24–33. <https://doi.org/10.1111/phn.12158>

- Black Women's Health Imperative. (2018). *Heart disease in black women: The big issue you might not know about*. <https://bwhi.org/2018/02/12/heart-disease-black-women-big-issue-might-not-know/>
- Bolin, J. N., Bellamy, G. R., Ferdinand, A. O., Vuong, A. M., Kash, B. A., Schulze, A., & Helduser, J. W. (2015). Rural Healthy People 2020: New decade, same challenges. *The Journal of Rural Health*, 31(3), 326–333.
<https://doi.org/10.1111/jrh.12116>
- Bloom, J. R., Stewart, S. L., Oakley-Girvans, I., Banks, P. J., & Chang, S. (2006). Family history, perceived risk, and prostate cancer screening among African American men. *Cancer Epidemiology and Prevention Biomarkers*, 15(11), 2167–2173.
<https://doi.org/10.1158/1055-9965.EPI-05-0738>
- Booth, J. N., 3rd, Allen, N. B., Calhoun, D., Carson, A. P., Deng, L., Goff, D. C., Jr., Redden, D. T., Reis, J. P., Shimbo, D., Shikany, J. M., Sidney, Spring, B., Lewis, C. E., & Muntner, P. (2019). Racial differences in maintaining optimal health behaviors into middle-age. *American Journal of Preventive Medicine*, 56(3), 368–375. <https://doi.org/10.1016/j.amepre.2018.10.020>
- Braun, L. T., Wilbur, J., Buchholz, S. W., Schoeny, M. E., Miller, A. M., Fogg, L., Volgman, A. S., & McDevitt, J. (2016). Cardiovascular risk in midlife African American women participating in a lifestyle physical activity program. *Journal of Cardiovascular Nursing*, 31(4), 304–312.
<https://doi.org/10.1097/JCN0000000000000266>

Brawarsky, P., Eibensteiner, K., Klinger, E. V., Baer, H. J., Getty, G., Orav, E. J., Colditz, G., & Haas, J. S. (2018). Accuracy of self-perceived risk for common conditions. *Cogent Medicine*, 5(1).

<https://doi.org/10.1080/2331205X.2018.1463894>

Carnethon, M. R., Pu, J., Howard, G., Albert, M. A., Anderson, C. A., Bertoni, A. G., Mujahid, M. S., Palaniappan, L., Taylor, H. A., Willis, M., & Yancy, C. W. (2017). Cardiovascular health in African Americans: A scientific statement from the American Heart Association. *Circulation*, 136(21), e393–e423.

<https://doi.org/10.1161/CIR0000000000000534>

Centers for Disease Control and Prevention. (n.d.a). *Why are African American women at higher risk for stroke?* <https://www.cdc.gov/stroke/women.htm>

Centers for Disease Control and Prevention. (n.d.b). *Women and stroke*. <https://www.cdc.gov/stroke/women.htm>

Centers for Disease Control and Prevention. (n.d.c). *African American women and stroke*. https://www.cdc.gov/stroke/docs/AA_Women_Stroke_Factsheet.pdf

Centers for Disease Control and Prevention. (n.d.d). *Family history and other characteristics that increase risk for stroke*. https://www.cdc.gov/stroke/family_history.htm

Centers for Disease Control and Prevention. (2017a). *Stroke facts: Stroke statistics*. <https://www.cdc.gov/stroke/facts.htm>

- Centers for Disease Control and Prevention. (2017b). *Rural Americans at higher risk of death from five leading causes*. <https://www.cdc.gov/media/releases/2017/p0112-rural-death-risk.html>
- Centers for Disease Control and Prevention. (2019a). *Stroke mortality by state*. https://www.cdc.gov/nchs/pressroom/sosmap/stroke_mortality/stroke.htm
- Centers for Disease Control and Prevention. (2019b). *Conditions that increase risk for stroke*. <https://www.cdc.gov/stroke/conditions.htm>
- Centers for Disease Control and Prevention. (2020a). *Stroke facts: stroke statistics*. <https://www.cdc.gov/stroke/facts.htm>
- Centers for Disease Control and Prevention. (2020b). *About stroke*. <https://www.cdc.gov/stroke/about.htm>
- Chen, L. S. & Kaphingst, K. A. (2011). Risk perceptions and family history of lung cancer: Differences by smoking status. *Public Health Genomics*, 14, 26–34. <https://doi.org/10.1159/000294151>
- Choi, J. Y. (2012). A portrait of rural health in America. *Journal of Rural Social Sciences*, 27(3), 1–16.
- Christian, A. H., Rosamond, W., White, A. R., & Mosca, L. (2007). Nine-year trends and racial and ethnic disparities in women's awareness of heart disease and stroke: An American Heart Association National Study. *Journal of Women's Health*, 16(1), 68–81. <https://doi.org/10.1089/jwh.2006.M072>
- Chung, J. W., Kim, B. J., Han, M. K., Kang, K., Park, J. M., Park, S. S., Park, T. H., Cho, Y. J., Hong, K. S., Lee, K. B., Kim, J. G., Ko, Y., Lee, S., Nah, H. W., Kim, D. H.,

- Cha, J. K., Oh, M. S., Yu, K. H., Lee, B. C., ...Bae, H. J. (2016). Family history and risk of recurrent stroke. *Stroke*, 47(8), 1990–1996.
<https://doi.org/10.1161/STROKEAHA.116.013148>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- Cope, D. G. (2014). Using electronic surveys in nursing research. *Oncology Nursing Forum*, 41(6), 681–682. <https://doi.org/10.1188/14.ONF.681-682>
- Cornell, C. E., Littleton, M. A., Greene, P. G., Pulley, L., Brownstein, J. N., Sanderson, B. K., Stalker, V. G., Matson-Koffman, D., Struempler, B., & Raczynski, J. M. (2009). A community health advisor program to reduce cardiovascular risk among rural African-American women. *Health Education Research*, 24(4), 622–633.
<https://doi.org/10.1093/her/cyn063>
- County Health Rankings. (2019). *Arkansas: Phillips County*.
<https://www.countyhealthrankings.org/app/arkansas/2019/rankings/phillips/county/outcomes/overall/snapshot>
- Davis, S. K., Gebreab, S., Quarells, R., & Gibbons, G. H. (2014). Social determinants of cardiovascular health among black and white women residing in Stroke Belt and Buckle regions of the south. *Ethnicity & Disease*, 24(2), 133–143.
- Dearborn, J. L., & McCullough, L. D. (2009). Perception of risk and knowledge of risk factors in women at high risk for stroke. *Stroke*, 40, 1181–1186.
<https://doi.org/10.1161/STROKEAHA.108.543272>

- Diaz, V. A., Mainous, A. G., Williamson, D., Johnson, S. P., & Knoll, M. E. (2012). Cardiovascular and diabetes risk perception in a Hispanic community sample. *Ethnicity & Disease*, 22(1), 5–11.
- Early, K. B., & Stanley, K. (2018). Position of the Academy of Nutrition and Dietetics: The role of medical nutrition therapy and registered dietitian nutritionists in the prevention and treatment of prediabetes and type 2 diabetes. *Journal of the Academy of Nutrition and Dietetics*, 118(2), 343–353.
<https://doi.org/10.1016/j.jand.2017.11.021>
- Edwards, M. B., Jilcott, S. B., Floyd, M. F., & Moore, J. B. (2011). County-level disparities in access to recreational resources and associations with adult obesity. *Journal of Park and Recreation Administration*, 29(2), 39–54.
- Edwards, J.E., Thomas, M. D., Rosenfeld, P., & Booth-Kewley, S. (1997). *How to conduct organizational surveys: A step-by-step guide*. Sage Publications.
- Ellis, K. R., Young, T. L., Carthron, D., Simms, M., McFarlin, S., Davis, K. L., Dave, G., Corbie-Smith, G., & Cené, C. (2019). Perceptions of rural African American adults about the role of family in understanding and addressing risk factors for cardiovascular disease. *American Journal of Health Promotion*, 33(5), 708–717.
<https://doi.org/10.1177/0890117118799574>
- Ellis, P. D. (2010). *The essential guide to effect sizes: Statistical power, meta-analysis, and the interpretation of research results*. Cambridge University Press.

- Ferdinand, K. C. (2016). Cardiovascular risk reduction in African Americans: Current concepts and controversies. *Global Cardiology Science & Practice*, 2016(1), e201602. <https://doi.org/10.21542/gcsp.2016.2>
- Ferrer, R. A., & Klein, W. M. P. (2015). Risk perceptions and health behavior. *Current Opinion in Psychology*, 5, 85-89. <https://dx.doi.org/10.1016/j.copsyc.2015.03.012>
- Ferris, A., Robertson, R. M., Fabunmi, R., & Mosca, L. (2005). American Heart Association and American Stroke Association National Survey of stroke risk awareness among women. *Circulation*, 111, 1321–1326. <https://doi.org/10.1161/01.CIR.0000157745.46344.A1>
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Sage.
- Filsecker, M. (2014, August 19). A practical justification for using average instead of sum scores: if you use sum scores you need to be sure [Online forum post]. ResearchGate. https://www.researchgate.net/post/What_the_justification_is_for_using_a_sum_score_instead_of_an_average/53f49e8bd685cc587c8b465d/citation/download
- Fisher, M. (2008). Stroke and TIA: Epidemiology, risk factors, and the need for early intervention. *American Journal of Managed Care*, 14(6), S204–S211.
- Fongwa, M. N., Evangelista, L. S., Hays, R. D., Martins, D. S., Elashoff, D., Cowan, M. J., & Morisky, D. E. (2008). Adherence treatment factors in hypertensive African American women. *Vascular Health and Risk Management*, 4(1), 157–166. <https://doi.org/10.2147/VHRM.52063>

- Ford, C. D., Kim, M. J., & Dancy, B. L. (2009). Perceptions of hypertension and contributing personal and environmental factors among rural southern African American women. *Ethnicity & Disease*, 19(4), 407–413.
- Frates, B., Bonnet, J., Joseph, R., & Peterson, J. A. (2019). *Lifestyle medicine handbook: An introduction to the power of healthy habits* (2nd ed.). Healthy Learning.
- George, D., & Mallery, P. (2018). *IBM SPSS statistics 25 step by step: A simple guide and reference* (15th ed.). Routledge.
- George, S., Duran, N., & Norris, K. (2014). A systematic review of barriers and facilitators to minority research participation among African Americans, Latinos, Asian Americans, and Pacific Islanders. *American Journal of Public Health*, 104(2), e16–e31. <https://doi.org/10.2105/AJPH.2013.301706>
- Geraee, N., Kaveh, M. H., Shojaeizadeh, D., & Tabatabaee, H. R. (2015). Impact of media literacy education on knowledge and behavioral intention of adolescents in dealing with media messages according to Stages of Change. *Journal of Advances in Medical Education & Professionalism*, 3(1), 9–14.
- Girijala, R. L., Sohrabji, F., & Bush, R. L. (2017). Sex differences in stroke: Review of current knowledge and evidence. *Vascular Medicine*, 22(2), 135–145. <https://doi.org/10.1177/1358863X16668263>
- Graham, G. N., Leath, B., Payne, K., Guendelman, M., Reynolds, G., Kim, S., James, B., Ware, D., Hunter, M., Burwell, A., & Buggs, G. (2006). Perceived versus actual risk for hypertension and diabetes in the African American community. *Health Promotion Practice*, 7(1), 34–46. <https://doi.org/10.1177/1524839905283891>

- Gregory, C. O., Blanck, H. M., Gillespie, C., Maynard, L. M., & Serdula, M. K. (2008). Health perceptions and demographic characteristics associated with underassessment of body weight. *Obesity*, 16(5), 979–986.
<https://doi.org/10.1038/oby.2008.22>
- Grimm, K. A., Moore, L. V., & Scanlon, K. S. (2013). Access to healthier food retailers – United States, 2011. *CDC Health Disparities and Inequalities Report – United States*, 2013, 62(3), 20.
- Gutierrez, J. & Williams, O. A. (2014). A decade of racial and ethnic stroke disparities in the United States. *Neurology*, 82(12), 1080–1082.
<https://doi.org/10.1212/WNL.0000000000000237>
- Hales, C. M., Carroll, M. D., Fryar, C. D., & Ogden, C. L. (2017). Prevalence of obesity among adults and youth: United States, 2015-2016. *National Center for Health Statistics Data Brief*, 288, 1–8.
<https://www.cdc.gov/nchs/data/databriefs/db288.pdf>
- Hall, M. B., Vos, P., Bess, J. J., Reburn, K. L., Locklear, G. D., McAlister, J., & Bell, R. A. (2018). Cervical cancer screening behaviors and perceptions of medical mistrust among rural black and white women. *Journal of Health Care for the Poor and Underserved*, 29(4), 1368–1385. <https://doi.org/10.1353/hpu.2018.0101>
- Hankey, G. J. (2006). Potential new risk factors for ischemic stroke: What is their potential? *Stroke*, 37, 2181–2188.
<https://doi.org/10.1161/01.STR.0000229883.72010.e4>

- Harvey, R. D., & Afful, S. E. (2011). Racial typicality, racial identity, and health behaviors: A case for culturally sensitive health interventions. *Journal of Black Psychology*, 37(2), 164–184. <https://doi.org/10.1177/0095798410376244>
- Heart Attack and Stroke Prevention Center. (2019). *Risks of living in the Stroke Belt*. <http://www.thepreventioncenter.com/cardiovascular-disease/stroke-belt/>
- Heinrich, C. (2012). Health literacy: The sixth vital sign. *Journal of the American Academy of Nurse Practitioners*, 24(4), 218–223. <https://doi.org/10.1111/j.1745-7599.2012.00698.x>
- Helou, T. N., Santos, R. D., Laurinavicius, A. G., Bittencourt, M. S., Pesaro, A. E. P., Franco, F. G. M., Conceição, Carvalho, J. A. M., Silva, F. M. F., Wajngarten, M., & Katz, M. (2018). Association between clinical factors and self-underestimation of cardiovascular risk in subjects submitted to a routine health evaluation. *Clinical Cardiology*, 41, 28–33. <https://doi.org/10.1002/clc.22841>
- Henry-Okafor, Q., Cowan, P. A., Wicks, M. N., Rice, M., Husch, D. S., & Khoo, M. S. C. (2012). Effect of obesity on cardiovascular disease risk factors in African American women. *Biological Research for Nursing*, 14(2), 171–179. <https://doi.org/10.1177/1099800411405031>
- Hoover, D. S., Vidrine, J. I., Shete, S., Spears, C. A., Cano, M. A., Correa-Fernandez, V., Wetter, D. W., & McNeill, L. H. (2015). Health literacy, smoking, and health indicators in African American adults. *Journal of Health Communication*, 20(Suppl. 2), 24–33. <https://doi.org/10.1080/10810730.2015.1066465>

Hovick, S. R., Freimuth, V. S., Johnson-Turbes, A., & Chervin, D. D. (2011). Multiple health risk perception and information processing among African Americans and Whites living in poverty. *Risk Analysis*, 31(11), 1789–1799.

<https://doi.org/10.1111/j.1539-6924.2011.01621.x>

Howard, V. J., Kleindorfer, D. O., Judd, S. E., McClure, L. A., Safford, M. M., Rhodes, J. D., Cushman, M., Moy, C. S., Soliman, E. Z., Kissela, B. M., & Howard, G. (2011). Disparities in stroke incidence contributing to disparities in stroke mortality. *Annals of Neurology*, 69, 619–627. <https://doi.org/10.1002/ana.22385>

Hunt, B. R., Deot, D., & Whitman, S. (2014). Stroke mortality rates vary in local communities in a metropolitan area: Racial and spatial disparities and correlates. *Stroke*, 45(7), 2059–2065. <https://doi.org/10.1161/STROKEAHA.114.005431>

Imes, C. C., & Lewis, F. M. (2014). Family history of cardiovascular disease, perceived cardiovascular disease risk, and health-related behavior. *Journal of Cardiovascular Nursing*, 29(2), 108–129.

<https://doi.org/10.1097/JCN.0b013e31827db5eb>

Isaac, S., & Michael, W. B. (1995). *Handbook in research and evaluation*. EdITS.

Jacobsen, K. H. (2017). *Introduction to health research methods: A practical guide* (2nd ed.). Jones & Bartlett Learning.

James, C. V., Moonesinghe, R., Wilson-Frederick, S. M., Hall, J. E., Penman-Aguilar, A., & Bouye, K. (2017). Racial/ethnic disparities among rural adults – United States, 2012–2015. *Morbidity and Mortality Weekly Report. Surveillance Summaries* (Washington, D.C.: 2002), 66(23), 1–9. <https://doi.org/10.15585/mmwr.ss6623a1>

- James, D. C. S., Pobee, J. W., Oxidine, D., Brown, L., & Joshi, G. (2012). Using the health belief model to develop culturally appropriate weight-management materials for African-American women. *Journal of the Academy of Nutrition and Dietetics*, 112(5), 664–670. <https://doi.org/10.1016/j.jand.2012.02.003>
- Jeihooni, A. K., Arameshfard, S., Hatami, M., Mansourian, M., Kashfi, S. H., Rastegarimehr, B., Safari, O., & Amirkhani, M. (2018). The effect of educational program based on health belief model about HIV/AIDS among high school students. *International Journal of Pediatrics*, 6(3), 7285–7296. <https://doi.org/10.22038/ijp.2017.27226.2343>
- Jiménez, M. C., Manson, J. E., Cook, N. R., Kawachi, I., Wassertheil-Smoller, S., Haring, B., Nassir, R., Rhee, J. J., Sealy-Jefferson, S., & Rexrode, K. M. (2019). Racial variation in stroke risk among women by stroke risk factors. *Stroke*, 50(4), 797–804. <https://doi.org/10.1161/STROKEAHA.117.017759>
- Johns Hopkins Medicine. (2020). *3 ways to avoid a second stroke*. <https://www.hopkinsmedicine.org/health/conditions-and-diseases/stroke/3-ways-to-avoid-a-second-stroke>
- Johnson, R. B., & Christensen, L. (2020). *Educational research: Quantitative, qualitative, and mixed approaches* (7th ed.). Sage Publications.
- Jolly, S., Vittinghoff, E., Chattopadhyay, A., & Bibbins-Domingo, K. (2010). Higher cardiovascular disease prevalence and mortality among younger blacks compared to whites. *The American Journal of Medicine*, 123(9), 811–818. <https://doi.10.1016/j.amjmed.2010.04.020>

- Jones, S. P., Jenkinson, A. J., Leathley, M. J., & Watkins, C. L. (2010). Stroke knowledge and awareness: An integrative review of the evidence. *Age and Ageing*, 39, 11–22. <https://doi.org/10.1093/ageing/afp196>
- Kalinowski, J., Taylor, J. Y., & Spruill, T. M. (2019). Why are young black women at high risk for cardiovascular disease? *Circulation*, 139(8), 1003–1004. <https://doi.org/10.1161/CIRCULATIONAHA.118.037689>
- Kapral, M. K., Austin, P. C., Jeyakumar, G., Hall, R., Chu, A., Khan, A. M., Jin, A. Y., Martin, C., Manuel, D., Silver, F. L., Swartz, R. H., & Tu, J. V. (2019). Rural-urban differences in stroke risk factors, incidence, and mortality in people with and without prior stroke: The CANHEART stroke study. *Circulation: Cardiovascular Quality and Outcomes*, 12(2). <https://doi.org/10.1161/CIRCOUTCOMES.118.004973>
- Kelder, S. H., Hoelscher, D., & Perry, C. H. (2015). How individuals, environments, and health behaviors interact: Social cognitive theory. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior: Theory, research, and practice* (5th ed., pp. 159–181). Jossey-Bass.
- Kivelä, K., Elo, S., Kyngäs, H., & Kääriäinen, M. (2014). The effects of health coaching on adult patients with chronic diseases: A systematic review. *Patient Education and Counseling*, 97(2), 147–157. <https://doi.org/10.1016/j.pec.2014.07.026>
- Kleindorfer, D., Miller, R., Sailor-Smith, S., Moomaw, C. J., Khoury, J., & Frankel, M. (2008). The challenges of community-based research: The Beauty Shop Stroke

Education Project. *Stroke*, 39, 2331–2335.

<https://doi.org/10.1161/STROKEAHA.107.508812>

Kolber, M. R. & Scrimshaw, C. (2014). Family history of cardiovascular disease.

Canadian Family Physician Medecin de Famille Canadien, 60(11), 1016.

Krishnamurthi, R. V., Moran, A. E., Feigin, V. L., Barker-Collo, S., Norrving, B.,

Mensah, G. A., Taylor, S., Naghavi, M., Forouzanfar, M. H., Nguyen, G.,

Johnson, C. O., Vos, T., Murray, C. J. L., & Roth, G. A. (2015). Stroke

prevalence, mortality and disability-adjusted life years in adults aged 20–64 years in 1990–2013: Data from the global burden of disease 2013 study.

Neuroepidemiology, 45, 190–202. <https://doi.org/10.1159/000441098>

Kulshreshtha, A., Vaccarino, V., Goyal, A., McClellan, W., Nahab, F., Howard, V. J., &

Judd, S. E. (2015). Family history of stroke and cardiovascular health in a

national cohort. *Journal of Stroke and Cerebrovascular Diseases*, 24(2), 447–454.

<https://doi.org/10.1016/j.jstrokecerebrovasdis.2014.09.017>

Lacey, S. J. & Street, T. D. (2017). Measuring healthy behaviours using the stages of

change model: An investigation into the physical activity and nutrition behaviours of Australian minors. *BioPsychoSocial Medicine*, 11(30).

<https://doi.org/10.1186/s13030-017-0115-7>

Larsson, S. C., Wallin, A., Wolk, A., & Markus, H. S. (2016). Differing association of

alcohol consumption with different stroke types: A systematic review and meta-analysis. *BMC Medicine*, 14(178). <https://doi.org/10.1186/s12916-016-0721-4>

Leedy, P. D. & Ormrod. (2013). *Practical research: Planning and design* (10th ed.).

Pearson Education.

Liebson, P. R. (2010). Cardiovascular disease in special populations III: Stroke.

Preventive Cardiology, 13(1), 1–7. <https://doi.org/10.1111/j.1751-7141.2009.00041.x>

Lucas-Wright, A., Bazargan, M., Jones, L., Vadgama, J. V., Vargas, R., Sarkissyan, M.,

Smith, J., Yazdanshenas, H. & Maxwell, A. E. (2014). Correlates of perceived risk of developing cancer among African-Americans in South Los Angeles.

Journal of Community Health, 39(1), 173–180. <https://doi.org/10.1007/s10900-013-9756-z>

Lutfiyya, M. N., Cumba, M. T., McCullough, J. E., Barlow, E. L., & Lipsky, M. S.

(2008). Disparities in adult African American women's symptomatology: An analysis of 2003-2005 Behavioral Risk Factor Surveillance Survey Data. *Journal of Women's Health*, 17(5), 805–813. <https://doi.org/10.1089/jwh.2007.0599>

Mansyur, C. L., Pavlik, V. N., Hyman, D. J., Taylor, W. C., & Goodrick, G. K. (2013).

Self-efficacy and barriers to multiple behavior change in low-income African Americans with hypertension. *Journal of Behavioral Medicine*, 36(1), 75–85.

<https://doi.org/10.1007/s10865-012-9403-7>

Martin, M. Y., Person, S. D., Kratt, P., Prayor-Patterson, H., Kim, Y., Salas, M., & Pisu,

M. (2008). Relationship of health behavior theories with self-efficacy among insufficiently active hypertensive African-American women. *Patient Education and Counseling*, 72, 137–145. <https://doi.org/10.1016/j.pec.2008.02.012>

- Mayo Clinic. (2018). *Stroke*. <https://www.mayoclinic.org/diseases-conditions/stroke/symptoms-causes/syc-20350113>
- McKenzie, J. F., Neiger, B. L., & Smeltzer, J. L. (2016). *Planning, implementing, & evaluating health promotion programs* (7th ed.). Pearson.
- Mensah, G. A. (2018). Cardiovascular diseases in African Americans: Fostering community partnerships to stem the tide. *American Journal of Kidney Diseases*, 72(5), S37–42. <https://doi.org/10.1053/j.2018.06.026>
- Miller, C. E., & Vasan, R. S. (2020). The southern rural health and mortality penalty: A review of regional health inequities in the United States. *Social Science & Medicine*, 268, 113443. <https://doi.org/10.1016/j.socscimed.2020.113443>
- Moore, M., Jackson, E., & Tschannen-Moran, B. (2016). *Coaching psychology manual* (2nd ed.). Wolters Kluwer.
- Moore, S. E., Harris, C., & Wimberly, Y. (2010). Perception of weight and threat to health. *Journal of the National Medical Association*, 102(2), 119–124. [https://doi.org/10.1016/s0027-9684\(15\)30499-5](https://doi.org/10.1016/s0027-9684(15)30499-5)
- Mudd-Martin, G., Rayens, M. K., Lennie, T. A., Chung, M. L., Gokun, Y., Wiggins, A. T., Biddle, M. J., Bailey, A. L., Novak, M. J., Casey, B. R., & Moser, D. K. (2015). Fatalism moderates the relationship between family history of cardiovascular disease and engagement in health-promoting behaviors among at-risk rural Kentuckians. *The Journal of Rural Health*, 31(2), 206–216. <https://doi.org/10.1111/jrh.12094>

- Murry, V. M., & Brody, G. H. (2004). Partnering with community stakeholders: Engaging rural African American families in basic research and the strong African American Families Preventive Intervention Program. *Journal of Marital and Family Therapy*, 30(3), 271–283.
<https://doi.org/10.1111/j.1752-0606.2004.tb01240.x>
- Nardi, P. M. (2018). *Doing survey research: A guide to quantitative methods* (4th ed.). Routledge.
- National Alliance on Mental Illness. (2019). *African American mental health*.
<https://www.nami.org/find-support/diverse-communities/african-americans>
- National Commission for Health Education Credentialing. (2020). *Responsibilities and competencies for health education specialists*.
<https://www.nchec.org/responsibilities-and-competencies>
- National Institute of Neurological Disorders and Stroke. (2014). *Stroke rehabilitation information*. http://www.ninds.nih.gov/disorders/stroke/stroke_rehabilitation.htm
- O'Donnell, M. J., Xavier, D., Liu, L., Zhang, H., Chin, S. L., Rao-Melacini, P., Rangarajan, S., Islam, S., Pais, P., McQueen, M. J., Mondo, C., Damasceno, A., Lopez-Jaramillo, P., Hankey, G. J., Dans, A. L., Yusuf, K., Truelsen, T., Diener, H. C., Sacco, R., ... Yusuf, S. (2010). Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): A case-control study. *Lancet*, 376, 112–123. [https://doi.org/10.1016/S0140-6736\(10\)60834-3](https://doi.org/10.1016/S0140-6736(10)60834-3)
- Osborn, C. Y., Paasche-Orlow, M. K., Bailey, S. C., & Wolf, M. S. (2011). The mechanisms of linking health literacy to behavior and health status. *American*

Journal of Health Behavior, 35(1), 118–128.

<https://doi.org/10.5993/AJHB.35.1.11>

Ovbiagele, B., & Nguyen-Huynh, M. N. (2011). Stroke epidemiology: Advancing our understanding of disease mechanism and therapy, *Neurotherapeutics*, 8, 319–329.

<https://doi.org/10.1007/s13311-011-0053-1>

Paige, S. R., Bonnar, K. K., Black, D. R., & Coster, D. C. (2018). Risk factor knowledge, perceived threat, and protective health behaviors: Implications for type 2 diabetes control in rural communities. *The Diabetes Educator*, 44(1), 63–71.

<https://doi.org/10.1177/0145721717747228>

Perfetti, A. R. (2018). Fate and the clinic: A multidisciplinary consideration of fatalism in health behaviour. *Medical Humanities*, 44(1), 59–62.

<https://doi.org/10.1136/medhum-2017-011319>

Porter, S. R., & Whitcomb, M. E. (2003). The impact of lottery incentives on student survey response rates. *Research in Higher Education*, 44(4), 389–407.

Probst, J. C. & Ajmal, F. (2019, July). *Social determinants of health among the rural African American population* (Issue Brief No. 1).

https://www.sc.edu/study/colleges_schools/public_health/research/research_centers/sc_rural_health_research_center/documents/socialdeterminantsofhealthamongtheruralafricanamericanpopulation.pdf

Pourasgari, M. & Mohamadkhani, A. (2020). Heritability for stroke: Essential for taking family history. *Caspian Journal of Internal Medicine*, 11(3), 237–243.

<https://doi.org/10.22088/cjim.11.3.237>

- Prochaska, J. O., Redding, C. A., & Evers, K. E. (2015). The transtheoretical model and stages of change. In K. Glanz, B. K. Rimer, & Viswanath (Eds.), *Health behavior: Theory, research, and practice* (5th ed., pp. 125–148). Jossey-Bass.
- Real, B., Bertot, J. C., & Jaeger, P. T. (2014). Rural public libraries and digital inclusion: Issues and challenges. *Information Technology & Libraries*, 33(1), 6–24.
<https://doi.org/10.6017/ital.v33i1.5141>
- Reeves, M. J., Bushnell, C. D., Howard, G., Gargana, J. W., Duncan, P. W., Lynch, G., Khatiwoda, A., & Lisabeth, L. (2008). Sex differences in stroke: Epidemiology, clinical presentation, medical care, and outcomes. *The Lancet Neurology*, 7(10), 915–926. [https://doi.org/10.1016/S1474-4422\(08\)70193-5](https://doi.org/10.1016/S1474-4422(08)70193-5)
- Revilla, M., & Ochoa, C. (2017). Ideal and maximum length for a web survey. *International Journal of Market Research*, 59(5), 557–565.
<https://doi.org/10.2501/IJMR-2017-039>
- Resnick, D. B. (2015). Bioethical issues in providing financial incentives to research participants. *Medicolegal and Bioethics*, 5, 35–41.
<https://doi.org/10.2147/MB.S70416>
- Rexrode, K. M. (2010). Emerging risk factors in women. *Stroke*, 41, S9–S11.
<https://doi.org/10.1161/STROKEAHA.110.595280>
- Rhoads, S. & Rakes, A. L. (2020). Telehealth technology: Reducing barriers for rural residents seeking genetic counseling. *Journal of the American Association of Nurse Practitioners*, 32(3), 190–192.
<https://doi.org/10.1097/JXX.0000000000000373>

Riley, J. L., Dodd, V. J., Muller, K. E., Guo, Y., & Logan, H. L. (2012). Psychosocial factors associated with mouth and throat cancer examinations in rural Florida. *American Journal of Public Health, 102*(2), e7–e14.

<https://doi.org/10.2105/AJPH.2011.300504>

Robert Wood Johnson Foundation. (2008). *Criterion sampling*.

<http://www.qualres.org/HomeCrit-3814.html>

Robinson. E. (2017). Overweight but unseen: A review of the underestimation of weight status and a visual normalization theory. *Obesity Reviews, 18*, 1200–1209.

<https://doi.org/10.1111/obr.12570>

Roquer, J., Campello, A. R., & Gomis, M. (2003). Sex differences in first-ever acute stroke. *Stroke, 34*, 1581–1585.

<https://doi.org/10.1161/STR.0000078562.82918.F6>

Rowland, M. L. & Isaac-Savage, E. P. (2014). As I see it: A study of African American pastors' views on health and health education in the Black church. *Journal of Religion and Health, 53*(4), 1091–1101. [https://doi.org/10.1007/s10943-013-](https://doi.org/10.1007/s10943-013-9705-2)

[9705-2](https://doi.org/10.1007/s10943-013-9705-2)

Rural Health Information Hub. (2017). *Chronic disease in rural America*.

<https://www.ruralhealthinfo.org/topics/chronic-disease#contributing-factors>

Rural Health Information Hub. (2019). *Healthcare access in rural communities*.

<https://www.ruralhealthinfo.org/topics/healthcare-access>

- Sadler, G. R., Escobar, R. P., Ko, C. M., White, M., Lee, S., Neal, T., & Gilpin, E. A. (2005). African-American women's perceptions of their most serious health problems. *Journal of the National Medical Association*, 97(1), 31–40.
- Sakakibara, B. M., Kim, A. J., & Eng, J. J. (2017). A systematic review and meta-analysis of self-management for improving risk factor control in stroke patients. *International Journal of Behavioral Medicine*, 24(1), 42–53.
<https://doi.org/10.1007/s12529-016-9582-7>
- Salemink, K., Strijker, D., & Bosworth, G. (2017). Rural development in the digital divide age: A systematic literature review on unequal ICT availability, adoption, and use in rural areas. *Journal of Rural Studies*, 54(2017), 360–371.
<https://doi.org/10.1016/j.rurstud.2015.09.001>
- Sallar, A. M., Williams, P. B., Omishakin, A. M., & Lloyd, D. P. (2010). Stroke prevention: Awareness of risk factors for stroke among African American residents in the Mississippi Delta region. *Journal of the National Medical Association*, 102(2), 84–94. [https://doi.org/10.1016/S0027-9684\(15\)30495-8](https://doi.org/10.1016/S0027-9684(15)30495-8)
- Schroeder, K., McCormick, R., Perez, A., & Lipman, T. H. (2018). The role and impact of community health workers in childhood obesity interventions: A systematic review and meta-analysis. *Obesity Reviews*, 19(10), 1371–1384.
<https://doi.org/10.1111/obr.12714>
- Sharrief, A. Z., Johnson, B., Abada, S., & Urrutia, V. C. (2016). Stroke knowledge in African Americans: A narrative review. *Ethnicity & Disease*, 26(2), 255–262.
<https://doi.org/10.18865/ed.26.2.255>

- Shaw, L. J., Pepine, C. J., Xie, J., Mehta, P. K., Morris, A. A., Dickert, N. W., Ferdinand, K. C., Gulati, M., Reynolds, H., Hayes, S. N., Itchhaporia, D., Mieres, J. H., Ofili, E., Wenger, N. K., & Bairey Merz, C. N. (2017). Quality and equitable health care gaps for women: Attributions to sex differences in cardiovascular medicine. *Journal of the American College of Cardiology*, 70(3), 373–388.
<https://doi.org/10.1016/j.jacc.2017.05.051>
- Sheeran, P., Harris, P. R., & Epton, T. (2014). Does heightening risk appraisals change people's intentions and behaviors? A meta-analysis of experimental studies. *Psychological Bulletin*, 140(2), 511–543. <https://doi.org/10.1037/a0033065>
- Shrira, I., Christenfeld, N., & Howard, G. (2008). Exposure to the US Stroke Buckle as a risk factor for cerebrovascular mortality. *Neuroepidemiology*, 30(4), 229–233.
<https://doi.org/10.1159/000128102>
- Skinner, C. S., Tiro, J., & Champion, V. L. (2015). The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior: Theory, research, and practice* (5th ed., pp. 75–94). Jossey-Bass.
- Smajlović, D. (2015). Strokes in young adults: Epidemiology and prevention. *Vascular Health and Risk Management*, 11, 157–164.
<https://doi.org/10.2147/VHRM.S53203>
- Smith, K. B., Humphreys, J. S., & Wilson, M. G. A. (2008). Addressing the health disadvantage of rural populations: How does epidemiological evidence inform rural health policies? *Australian Journal of Rural Health*, 16, 56–66.
<https://doi.org/10.1111/j.1440-1584.2008.00953.x>

- Squiers, L., Renaud, J., McCormack, L., Tzeng, J., Bann, C., & Williams, P. (2014). How accurate are Americans' perceptions of their own weight? *Journal of Health Communication, 19*(7), 795–812. <https://doi.org/10.1080/10810730.2013.864727>
- Stansbury, J. P., Jia, H., Williams, L. S., Vogel, W. B., & Duncan, P. W. (2005). Ethnic disparities in stroke: Epidemiology, acute care, and postacute outcomes. *Stroke, 36*(2), 374–386. <https://doi.org/10.1161/01.STR.0000153065.39325.fd>
- Strimike, C. (2010). Increased prevalence of stroke risk factors among middle-aged and minority women. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 39*, S99–S101. <https://doi.org/10.1111/j.1552-6909.2010.01126.x>
- Sullivan, K. & Waugh, D. (2007). Toward development of the Cerebrovascular Attitudes and Beliefs Scale (CABS): A measure of stroke-related health beliefs. *Topics in Stroke Rehabilitation, 14*(3), 41–51. <https://doi.org/10.1310/tsr1403-41>
- Sullivan, K. A., White, K. M., Young, R. M., Chang, A., Roos, C., & Scott, C. (2008). Predictors of intention to reduce stroke risk among people at risk of stroke: An application of an extended Health Belief Model. *Rehabilitation Psychology, 53*(4), 505–512. <https://doi.org/10.1037/a0013359>
- Sullivan, K. A., White, K. M., Young, R. M., & Scott, C. (2010). The Cerebrovascular Attitudes and Beliefs Scale (CABS-R): The factor structure and psychometric properties of a tool for assessing stroke-related health beliefs. *International Journal of Behavioral Medicine, 17*(1), 67–73. <https://doi.org/10.1007/s12529-009-9047-3>

- Sutcliffe, C. G., Schultz, K., Brannock, J. M., Giardiello, F. M., & Platz, E. A. (2015). Do people know whether they are overweight? Concordance of self-reported, interview-observed, and measured body size. *Cancer Causes Control*, 26, 91–98. <https://doi.org/10.1007/s10552-014-0487-y>
- Towfighi, A., Saver, J. L., Engelhardt, R., & Ovbiagele, B. (2007). A midlife stroke surge among women in the United States. *Neurology*, 69(20), 1898–1907. <https://doi.org/10.1212/01.wnl.0000268491.89956.c2>
- Towfighi, A., Zheng, L., & Ovbiagele, B. (2010). Weight of the obesity epidemic: Rising stroke rates among middle-aged women in the United States. *Stroke*, 41, 1371–1375. <https://doi.org/10.1161/STROKEAHA.109.577510>
- Trimble, B., & Morgenstern, L. B. (2008). Stroke in Minorities. *Neurologic Clinics*, 26(4), 1177–1190. <https://doi.org/10.1016/j.ncl.2008.05.010>
- Trivedi, T., Liu, J., Probst, J., Merchant, A., Jones, S., & Martin, A. B. (2015). Obesity and obesity-related behaviors among rural and urban adults in the USA. *Rural Remote Health*, 15(4), 3267. <https://doi.org/10.22605/RRH3267>
- United Health Foundation. (2019). *Public health impact: Stroke*. <https://www.americashealthrankings.org/explore/annual/measure/Stroke/state/AL>
- L
- University of Arkansas System: Division of Agriculture, Research & Extension. (2019). *Rural profile of Arkansas*. <https://www.uaex.edu/publications/pdf/MP551.pdf>

U.S. Census Bureau. (2018). *Quick facts: Phillips County, Arkansas*.

<https://www.census.gov/quickfacts/phillipscountyarkansas>

U.S. Census Bureau. (2019). *Community facts: Phillips County, Arkansas*. Retrieved

from

<https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>

U.S. Department of Health and Human Services, Office of Disease Prevention and Health

Promotion. (n.d.a). Heart disease and stroke. In *Healthy People 2030*.

<https://health.gov/healthypeople/objectives-and-data/browse-objectives/heart-disease-and-stroke>

U.S. Department of Health and Human Services, Office of Disease Prevention and Health

Promotion. (n.d.b). Increase the health literacy of the population. In *Healthy*

People 2030. <https://health.gov/healthypeople/objectives-and-data/browse-objectives/health-communication/increase-health-literacy-population-hchit-r01>

U.S. Department of Health and Human Services, Office of Minority Health. (2019).

Obesity and African Americans.

<https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=25>

Vik, K. L., Romundstad, P., Carslake, D., Smith, G. D., & Nilsen, T. I. (2016).

Transgenerational effects of parental cardiovascular disease and risk factors on offspring mortality: Family-linkage data from the HUNT Study, Norway.

European Journal of Preventive Cardiology, 23(2), 145–153.

<https://doi.org/10.1177/2047487314562118>

Virani, S. S., Alonso, A., Aparicio, H. J., Benjamin, E. J., Bittencourt, M. S., Callaway, C. W., Carson, A. P., Chamberlain, A. M., Cheng, S., Delling, F.N., Elkind, M. S. V., Evenson, K. R., Ferguson J. F., Gupta, D. K., Khan, S. S., Kissela, B. M., Knutson, K. L., Lee, C. D., Lewis, T. T., . . . Tsao, C. W. (2021). Heart disease and stroke statistics—2021 update: A report from the American Heart Association. *Circulation*, 143(8), e254–e273.

<https://doi.org/10.1161/CIR.0000000000000950>

Vornanen, M., Konttinen, H., Kääriäinen, H., Männistö, S., Salomaa, V., Perola, M., & Haukka, A. (2016). Family history and perceived risk of diabetes, cardiovascular disease, cancer, and depression. *Preventive Medicine*, 90, 177–183. <https://doi.org/10.1016/j.ypmed.2016.06.027>

Wang, C., Sen, A., Ruffin, M. T., Nease, D. E., Gramling, R., Acheson, L. S., O’Neill, S. M., & Rubinstein, W. S. (2012). Family history assessment: Impact on disease risk perceptions. *American Journal of Preventive Medicine*, 43(4), 392–398. <https://doi.org/10.1016/j.amepre.2012.06.013>

Wang, C., O’Neill, S. M., Rothrock, N., Gramling, R., Sen, A., Acheson, L. S., Rubenstein, W. S., Nease, D. E., & Ruffin, M. T. (2009). Comparison of risk perceptions and beliefs across common chronic diseases. *Preventive Medicine*, 48, 197–202. <https://doi.org/10.1016/j.ypmed.2008.11.008>

Warren, J., Smalley, B., & Barefoot, N. (2016). Higher motivation for weight loss in African American than Caucasian rural patients with hypertension and/or diabetes. *Ethnicity & Disease*, 26(1), 77–84. <https://doi.org/10.18865/ed.26.1.77>

- Warren-Findlow, J., Seymour, R. B., & Brunner Huber, L. R. (2012). The association between self-efficacy and hypertension self-care activities among African American adults. *Journal of Community Health*, 37(1), 15–24.
<https://doi.org/10.1007/s10900-011-9410-6>
- Webster, R., & Heeley, E. (2010). Perceptions of risk: Understanding cardiovascular disease. *Risk Management and Healthcare Policy*, 3, 49–60.
<https://doi.org/10.2147/RMHP.S8288>
- Whitt-Glover, M. C., Borden, S. L., Alexander, D. S., Kennedy, B., & Goldmon, M. V. (2016). Recruiting African American churches to participate in research: The learning and developing individual exercise skills for a better life study. *Health Promotion Practice*, 17(2), 297–306. <https://doi.org/10.1177/1524839915623499>
- Williams, D. R., Mohammed, S. A., Leavell, J., & Collins, C. (2010). Race, socioeconomic status, and health: Complexities, ongoing challenges, and research opportunities. *Annals of the New York Academy of Sciences*, 1186(1), 69–101.
<https://doi.org/10.1111/j.1749-6632.2009.05339>
- Winham, D. M., & Jones, K. M. (2011). Knowledge of young African American adults about heart disease: A cross-sectional survey. *BMC Public Health*, 11(1), 248–258. <https://doi.org/10.1186/1471-2458-11-248>
- World Health Organization. (2020). *The top 10 causes of death*.
<https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>
- Worrall, B. B., Johnston, K. C., Kongable, G., Hung, E., Richardson, D., & Gorelick, P. B. (2002). Stroke risk factors profiles in African American women: An interim

- report from the African-American Antiplatelet Stroke Prevention Study. *Stroke*, 33, 913–919. <https://doi.org/10.1161/hs0402.105337>
- Yahya, T., Jilani, M. H., Khan, S. U., Mszar, R., Hassan, S. Z., Blaha, M. J., Blankstein, R., Virani, S. S., Johansen, M. C., Vahidy, F., Cainzos-Achirica, M., & Nasir, K. (2020). Stroke in young adults: Current trends, opportunities for prevention and pathways forward. *American Journal of Preventive Cardiology*, 3, 100085. <https://doi.org/10.1016/j.ajpc.2020.100085>
- Yang, K., Baniak, L. M., Imes, C. C., Choi, J., & Chasens, E. R. (2018). Perceived versus actual risk of type 2 diabetes by race and ethnicity. *The Diabetes Educator*, 44(3), 269–277. <https://doi.org/10.1177/0145721718770983>
- Yang, Q., Tong, X., Schieb, L., Vaughan, A., Gillespie, C., Wiltz, J., King, S. C., Odom, E., Merritt, R., Hong, Y., & George, M. G. (2017). Vital signs: Recent trends in stroke death rates – United States, 2000–2015. *Morbidity and Mortality Weekly Report (MMWR)*, 66(35), 933–939. <https://doi.org/10.15585/mmwr.mm6635e1>
- Zahnd, W. E., Scaife, S. L., & Francis, M. L. (2009). Health literacy skills in rural and urban populations. *American Journal of Health Behavior*, 33(5), 550–557. <https://doi.org/10.5993/AJHB.33.5.8>

APPENDIX A

IRB Approval Letter



Texas Woman's University
Institutional Review Board (IRB)

irb@twu.edu

<https://www.twu.edu/institutional-review-board-irb/>

August 10, 2020

Kristy Jamerson
Health Promotion & Kinesiology

Re: Exempt - IRB-FY2020-339 Dare to Be Aware: Examining Stroke Risk Perception in African American Women Aged 35-54 in Rural Arkansas

Dear Kristy Jamerson,

The above referenced study has been reviewed by the TWU IRB - Denton operating under FWA00000178 and was determined to be exempt on August 7, 2020.

Note that any modifications to this study must be submitted for IRB review prior to their implementation, including the submission of any agency approval letters, changes in research personnel, and any changes in study procedures or instruments. Additionally, the IRB must be notified immediately of any adverse events or unanticipated problems. All modification requests, incident reports, and requests to close the file must be submitted through Cayuse.

On August 6, 2021, this approval will expire and the study must be renewed or closed. A reminder will be sent 45 days prior to this date.

If you have any questions or need additional information, please contact the IRB analyst indicated on your application in Cayuse or refer to the IRB website at <http://www.twu.edu/institutional-review-board-irb/>.

Sincerely,

TWU IRB - Denton

APPENDIX B

IRB Modification Approval



Texas Woman's University
Institutional Review Board (IRB)

irb@twu.edu

<https://www.twu.edu/institutional-review-board-irb/>

May 24, 2021

Kristy Jamerson
Health Promotion & Kinesiology

Re: Modification - IRB-FY2020-339 Dare to Be Aware: Examining Stroke Risk Perception in African American Women Aged 35-54 in Rural Arkansas

Dear Kristy Jamerson,

The modifications listed below have have been reviewed and approved on May 24, 2021 by theTWU IRB - Denton.

Modifications:

The executive director of the Boy, Girls, Adult Community Development Center - BGACDC will assist the PI in recruitment for the study by facilitating meetings where scheduled events will take place. They will also share the recruitment flyer with several church leaders to place on their bulletin board.

If you have any questions or need additional information, please email your IRB analyst at irb@twu.edu or refer to the [IRB website](#).

Sincerely,

TWU IRB - Denton

APPENDIX C

IRB Modification Approval



Texas Woman's University
Institutional Review Board (IRB)

irb@twu.edu

<https://www.twu.edu/institutional-review-board-irb/>

September 7, 2021

Kristy Jamerson
Health Promotion & Kinesiology

Re: Modification - IRB-FY2020-339 Dare to Be Aware: Examining Stroke Risk Perception in African American Women Aged 35-54 in Rural Arkansas

Dear Kristy Jamerson,

The modifications listed below have have been reviewed and approved on September 3, 2021 by theTWU IRB - Denton.

Modifications:

The wording in two research questions and hypotheses has been modified for more accurate identification that risk factors are addressed in the study, not risk behaviors. The wording changes do not alter anything about the study itself.

If you have any questions or need additional information, please email your IRB analyst at irb@twu.edu or refer to the [IRB website](#).

Sincerely,

TWU IRB - Denton

APPENDIX D

Approved Consent Form

TEXAS WOMAN'S UNIVERSITY

CONSENT TO PARTICIPATE IN RESEARCH

Title: Dare to Be Aware: Examining Stroke Risk Perception in African American Women Aged 35-54 in Rural Arkansas

Investigator: Kristy Jamerson, M.S., C.H.E.S. kjamerson@twu.edu (501-852-2681)

Advisor: Marilyn Massey-Stokes, Ed.D. mmasseystokes@twu.edu (940-898-2863)

Purpose of the Research

You are being asked to take part in a research study for Kristy Jamerson's dissertation at Texas Woman's University. This research study explores the relationship between the personal identification of stroke risk factors, perceived risk of stroke, and the likelihood that stroke risk factors will be reduced in rural African American women aged 35-54.

Procedures

As a participant in this study, you will be asked to answer a series of survey questions that should take 20-25 minutes to complete. To protect your confidentiality, no identifying information will be included in the presentation of this data. All data will be securely stored and only accessible to the principle investigator.

Potential Risks

Participation in this study is not expected to cause any harm. However, some participants may experience minimal discomfort. For example, it is possible that you may have an emotional response to one or more of the questions on the survey. Other potential risks are possible loss of anonymity if the survey is taken in person, feeling coerced if asked to complete the survey onsite, or possible exposure to COVID-19 if completing the survey in a face-to-face setting. Additionally, there is a potential risk of loss of confidentiality in all email, downloading, electronic meetings, and internet transactions.

Minimizing Risks

If you experience any emotional distress during or after this study, you can contact the local Phillips County Health Unit (870-572-9028) or East Arkansas Family Health Center (870-735-3842). Additionally, you can access American Stroke Association stroke prevention resources at <https://www.stroke.org/en/professionals/stroke-resource-library/prevention/prevention-materials>.

To help maintain anonymity, data will only be collected at the end of any face-to-face classes or events after non-participants have exited.

Participation is voluntary and you may withdraw from the survey at any time without penalty.

The following steps have been taken to significantly reduce the chances of exposure COVID-19 if you are a participant completing the survey in a face-to-face setting: prescreening to ensure that the researcher and all participants are asymptomatic, face coverings are required, alcohol-based hand sanitizer must be used upon entry, social distancing will be enforced, and electronic devices and surfaces will be disinfected after each participant. However, TWU does not provide medical services or financial assistance for illness or injuries that might occur as a result of your taking part in this research.

Efforts will be made to maintain confidentiality by not requiring contact information during survey completion. If you would like to enter the lottery gift card drawing, you will be provided a separate web link to submit your name and address, which prevents the information from being connected in any way to the survey you completed.

Potential Benefits of the Research

While no direct benefit from participation in the study is certain, if significant results are found you will be influencing future stroke literature and health education, promotion, and prevention programs regarding stroke. Additionally, at the end of the survey you will have the opportunity to register for a drawing in which names will be randomly selected for 25 Walmart gift cards worth \$10.00 each and one grand prize Visa gift card worth \$50.00.

Questions Regarding the Study

If you have any questions about the research study please ask the researcher, Kristy Jamerson, at kjamerson@twu.edu or by phone (501-852-2681). If you have questions about your rights as a research participant, you may contact the Texas Woman's University Office of Research and Sponsored programs at 940-898-3378 or via email at irb@twu.edu.

Participant Agreement

I have read the information provided above and the research study has been explained to me. I have been given the opportunity to ask questions and any questions I had have been answered to my satisfaction. If I have additional questions, I have been instructed who to contact. I agree to participate in the research study described above.

Completion of this survey constitutes your consent to participate in this research study.

APPENDIX E

Letter of Support

1393 Highway 242 South
Helena-West Helena, AR 72342

870-572-2727 (phone)
870-572-6642 (fax)

[http://ruralhealth.uams.edu/
uamseast](http://ruralhealth.uams.edu/uamseast)

UAMS

EAST

UNIVERSITY OF ARKANSAS
FOR MEDICAL SCIENCES

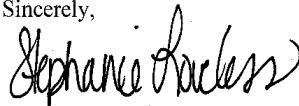
June 1, 2020

Texas Woman's University IRB
304 Administration Dr.
Denton, TX 76204

Dear TWU IRB,

This letter is to support Kristy Jamerson's research proposal entitled, "Dare to Be Aware: Examining Stroke Risk Perception in African American Women Aged 35-54 in Rural Arkansas." We, University of Arkansas for Medical Sciences (UAMS) East Regional Campus, agree to allow Kristy Jamerson to recruit participants for her study from individuals participating in our health coaching classes and other educational programs. If any additional information is needed, please contact me at 870-714-3036.

Sincerely,

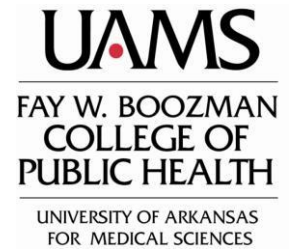


Stephanie Loveless, MPH
Director of Outreach
UAMS East Regional Campus

APPENDIX F

Letter of Support

4301 West Markham, #820
Little Rock, Arkansas 72205-7199
501/526-6600
501/526-6650 (fax)
www.uams.edu/coph



Friday, June 26, 2020

Texas Woman's University
IRB 304 Administration Dr.
Denton, TX 76204

Dear TWU IRB,

This letter is to support Kristy Jamerson's research proposal entitled, "Dare to Be Aware: Examining Stroke Risk Perception in African American Women Aged 35-54 in Rural Arkansas." As a team leader of Arkansas FAITH Network, I agree to allow Kristy to recruit participants for her study from members of Arkansas FAITH Network. Until it is safe to resume face-to-face events (due to COVID-19), the survey questionnaire will be predominantly made available via eNewsletter and email through our listserv.

If any additional information is needed, please contact me at 501-526-6698

Sincerely,

A handwritten signature in black ink, appearing to read "Keneshia Bryant-Moore".

Keneshia Bryant-Moore, PhD, APRN, FNP-BC
Director, Arkansas FAITH Network
Assistant Dean for Diversity, Equity and Inclusion
Associate Professor
Health Behavior and Health Education
Fay W. Boozman College of Public Health
University of Arkansas for Medical Sciences

"The UAMS College of Public Health is funded, in part, from Tobacco Settlement Funds"

APPENDIX G

Letter of Support



BOYS, GIRLS ADULTS COMMUNITY DEVELOPMENT CENTER, INC.
P.O. Box 1356 - 306 HWY 49
Marvell, Arkansas 72366
Phone (870) 829-3274 Fax (870) 829-2282
bgacdc@suddenlinkmail.com - www.bgacdc.com

April 23, 2021

Texas Woman's University IRB
304 Administration Dr.
Denton, TX 76204

Dear TWU IRB,

This letter is to support Kristy Jamerson's research proposal entitled, "Dare to Be Aware: Examining Stroke Risk Perception in African American Women Aged 35-54 in Rural Arkansas." As executive director of Boys, Girls, Adults Community Development Center (BGACDC), I agree to allow Kristy to recruit participants for her study from members of BGACDC community events. There will be opportunities for the survey to be administered face-to-face as well as online. (Note: The Arkansas mask mandate was lifted on March 31, 2021; however, BGACDC still requires face coverings for safety at its events).

If any additional information is needed, please contact me at 870-829-3274.

Striving to make a positive difference,

Beatrice Shelby

Executive Director

"An Equal Opportunity Provider and Employer" "People United To Save Children"

APPENDIX H

Study Recruitment Flyer

PARTICIPANTS WANTED FOR RESEARCH STUDY:

Risk Perception in African American Women

African American women who are 35-54 years
of age to participate in a study on stroke risk
perception

Participation in this study is voluntary

Please click the following link to participate in
the study: (Website)

**There is a potential risk of loss of
confidentiality in all email, downloading,
electronic meetings, and internet transactions.*

Please contact Kristy Jamerson at
kjamerson@twu.edu if you have any
questions.

APPENDIX I
Recruitment Script

Recruitment Script

Hello, my name is Kristy Jamerson and I am a doctoral student working on my Ph.D. in Health Studies at Texas Woman's University. I want to talk to you about participating in my research study. This study is about examining perceptions about the risk of having a stroke among African American women in Phillips County, AR. You are eligible to be in this study if you are 35-54 years of age and if you are a current Phillips County resident.

If you decide to participate in this study, you will be asked to complete a survey questionnaire that asks basic questions about your health history, your feelings and beliefs about stroke and, your knowledge of stroke and its risk factors. The survey will take approximately 20-25 minutes to complete. After completing the survey, you will have the opportunity to register for one of 25 Walmart gift cards worth \$10.00 and one Visa gift card worth \$50.00.

Remember, this is completely voluntary. You can choose to participate or not. If you choose to participate, you can complete the survey today on an iPad or laptop that will be provided, or there is a paper-pencil version available. If you would like to participate but you do not want to complete the survey here, I can provide you with the web address so you can complete the survey at a later time.

Do you have any questions for me at this time?

Thank you very much.

APPENDIX J

Lottery Raffle Drawing

Lottery Raffle Drawing

Start of Block: Lottery Raffle Drawing Entry

Q1 Please provide the requested information below for entry into the raffle for one of 25 gift cards valued at \$10.00 and for a grand prize Visa gift card worth \$50.00.

- ☐ Name (1) _____
- ☐ Address (2) _____
- ☐ Address 2 (3) _____
- ☐ City (4) _____
- ☐ State (5) _____
- ☐ Postal code (6) _____

APPENDIX K

Permission from Instrument Author

Re: Cerebrovascular Attitudes and Belief Scale

Inbox



Duston Morris <dustonm@uca.edu>

Sep 21,
2018, 11:00
AM

to Karen, me

Karen,

I met with my doctoral student (Kristy Jamerson) and we determined it would be beneficial to see the full instrument in order to fully examine the survey items assessing susceptibility, severity, and self-report risk factors. We are interested in looking at middle age African American women who have two or more stroke risks factors. Your article (Sullivan, White, Young, & Scott, 2009) outlines a number of stroke risk factors. We believe it would be helpful for us to review and possibly utilize your full instrument as we know from our literature review that African American women tend to have numerous risk factors, however we hypothesize that their perceived susceptibility and severity of stroke risk is low. We want to determine if there is a relationship between the number of self-reported stroke risk factors and perceived susceptibility and severity of stroke risk for African American women. Thank you for allowing us the opportunity to build from your work. Please let me know if you have any questions or suggestions that might strengthen Kristy's project. We look forward to hearing from you.

My Best..

Duston

On Mon, Sep 17, 2018 at 10:47 AM, Duston Morris <dustonm@uca.edu> wrote:
Karen,

Thank you for being so kind and sharing your work. This is extremely helpful, and I'm interested in learning more about your work. We are currently reviewing this portion of your scale and the references you provided. Once we have completed the review and determine if we need to use the full measure, I will be in contact.

Thanks Again..

Duston

On Sun, Sep 16, 2018 at 7:13 PM, Karen Sullivan <karen.sullivan@qut.edu.au> wrote:

Dear Prof Morris,

I do hope that this instrument may be useful for your study. Please find attached some more information about this measure. This attachment is for a single behaviour (beliefs about exercise for stroke prevention) and global beliefs about the severity of this condition. If you would like to see the full measure (across numerous behaviours), please let me know.

Good luck with your interesting study.

Karen Sullivan

From: Duston Morris [mailto:dustonm@uca.edu]

Sent: Saturday, 15 September 2018 3:26 AM

To: Karen Sullivan <karen.sullivan@qut.edu.au>

Subject: Cerebrovascular Attitudes and Belief Scale

Dr. Sullivan,

My name is Duston Morris and I'm an Associate Faculty in the Department of Health Sciences at the University of Central Arkansas. I am working with one of our PhD candidates who is interested in investigating perceived stroke risk and stroke knowledge among rural middle-age African American Women. In the United States, our state (Arkansas) ranks in the top five as it relates stroke morbidity and mortality.

She has completed a review of the literature and located your instrument (CABS). It is the only instrument we have been able to locate that uses the Health Belief Model and its theoretical framework. My student is using the same model for her dissertation and we were hoping that we might be able to get your approval to use your instrument for her data collection.

If you have any questions or concerns, please feel free to contact me. We hope to be able to use your instrument to replicate some of your work and determine cerebrovascular attitudes and beliefs among African American women in Arkansas.

We look forward to hearing from you.

Thank you...

--

Duston Morris, PhD, MS, CHES, Faculty Senator
Associate Professor, Department of Health Sciences
University of Central Arkansas
Office: (501) 450-3194
Cell: (501) 504-5250

UCA: Academic Vitality, Integrity, & Diversity

--

Duston Morris, PhD, MS, CHES, Faculty Senator
Associate Professor, Department of Health Sciences
University of Central Arkansas
Office: (501) 450-3194
Cell: (501) 504-5250

UCA: Academic Vitality, Integrity, & Diversity

APPENDIX L

Instrument

Cerebrovascular Attitudes and Beliefs Scale-Revised (CABS-R)

Colour coding notes:

Susceptibility
General intention
6 month intention
Benefits
Barriers
Ease
Subjective norm

CABS-R subscale breakdown

Exercise uptake –

Susceptibility

- It is likely that I will have a stroke if I don't exercise regularly
- The likelihood of my having a stroke is high if I don't exercise
- My chances of having a stroke are high if I don't exercise regularly

General intention

- It is likely that I will undertake regular exercise
- Generally speaking, I intend to undertake regular exercise

6 month intention

- It is likely that I will undertake regular exercise in the next 6 months
- I intend to undertake regular exercise in the next 6 months

Benefits

- I have a lot to gain from exercising
- Exercise will help me avoid stroke
- Exercising makes me feel better
- I enjoy exercising

Barriers

- I am afraid to exercise
- I don't have time to exercise
- Exercising interferes with my other activities
- I feel too embarrassed to exercise
- Exercising can be painful for me

Ease

- It would be easy for me to exercise regularly
- It would be hard for me to exercise regularly (reverse scored)

Subjective norm

- Most people who are important to me would want me to exercise
- Most people who are important to me would approve of me exercising

Smoking cessation –

Susceptibility

- The likelihood of my having a stroke is high if I don't stop smoking
- I think it is likely I will have a stroke if I don't stop smoking
- My chances of having a stroke are high if I don't stop smoking

General intention

- Generally speaking, I intend to stop smoking
- It is likely that I will stop smoking

6 month intention

- It is likely that I will stop smoking in the next 6 months
- I intend to stop smoking in the next 6 months

Benefits

- I have a lot to gain by giving up smoking
- My risk of stroke would be less if I gave up smoking
- I would feel better if I stopped smoking
- Giving up smoking will help my future

Barriers

- I enjoy smoking too much to give it up
- Giving up smoking would require too much effort
- I am afraid to give up smoking
- My social life makes it hard to give up smoking
- I would find it distressing to give up smoking

2

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Ease

- It would be hard for me to stop smoking
- It would be easy for me to stop smoking

Subjective norm

- Most people who are important to me would want me to stop smoking
- Most people who are important to me would approve of me quitting smoking

Diabetes –

Susceptibility¹

- The chances of me having a stroke are high if I don't have regular diabetes checks
- I think it is likely I will have a stroke if I don't have regularly diabetes checks
- I think it is likely I will have a stroke if I don't take my diabetes medications as prescribed
- The likelihood of my having a stroke is high if I don't have regular diabetes checks

General intention

- It is likely that I will have regular diabetes checks
- Generally speaking, I intend to have regular diabetes checks

6 month intention

- I intend to have regular diabetes checks in the next 6 months
- It is likely that I will have regular diabetes checks in the next 6 months

Benefits

- I can benefit from regular diabetes checks

Barriers

- I am afraid to check my blood sugar level
- I find it too painful to check my blood sugar levels
- It takes too long to check my blood sugar levels for my diabetes

Ease

- It would be easy for me to have regular diabetes checks
- It would be hard for me to have regular diabetes checks

Subjective norm

- Most people who are important to me would want me to have regular diabetes checks
- Most people who are important to me would approve of me having regular diabetes checks

Medication –

Susceptibility

- The likelihood of my having a stroke is high if I don't take my medication
- My chances of having a stroke are high if I don't take my medication
- It is likely that I will have a stroke if I don't take my medication

General intention

- Generally speaking, I intend to take my medication as prescribed
- It is likely that I will take my medication as prescribed

6 month intention

- It is likely that I will take my medication as prescribed in the next 6 months
- I intend to have take my medication as prescribed in the next 6 months

Benefits

- I worry less if I take my medication
- I have a lot to gain by taking my medication
- Taking my medication will prevent me from having a stroke

Barriers

- I am afraid to take my medication
- I am embarrassed to take my medication
- It is difficult to remember to take my medication
- Taking my medication can make me feel ill
- I have to give up other activities to take my medication

Ease

- It would be easy for me to take my medications
- It would be hard for me to take my medication

Subjective norm

- Most people who are important to me would want me to take my medication
- Most people who are important to me would approve of me taking my medication

¹ The calculation of the susceptibility subscale in previous research took into account 3 of the 4 items only

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High Blood Pressure –

Susceptibility

- The likelihood of my having a stroke is high if I don't have my blood pressure checked regularly
- I think it is likely I will have a stroke if I don't have my blood pressure regularly checked
- My chances of having a stroke are high if I don't have my blood pressure regularly checked

General intention

- Generally speaking, I intend to have my blood pressure checked regularly
- It is likely that I will have my blood pressure checked regularly

6 month intention

- I intend to have regular blood pressure checks in the next 6 months
- It is likely that I will have my blood pressure checked regularly in the next 6 months

Benefits

- I have a lot to gain by controlling my blood pressure
- Checking my blood pressure regularly will help me prevent future stroke
- Controlling my blood pressure is a good way to avoid stroke

Barriers

- Attending appointments for blood pressure checks is time consuming for me
- I find it difficult to attend appointments for blood pressure checks
- I am afraid to have my blood pressure checked
- Having blood pressure checks are painful
- It is embarrassing for me to have my blood pressure checked

Ease

- It would be hard for me to have regular blood pressure checks
- It would be easy for me to have regular blood pressure checks

Subjective norm

- Most people who are important to me would approve of me getting my blood pressure checked regularly
- Most people who are important to me would want me to get my blood pressure checked regularly

High Cholesterol –

Susceptibility

- The likelihood of my having a stroke is high if I don't have my cholesterol regularly checked
- My chances of having a stroke are high if I don't have my cholesterol regularly checked
- I think it is likely I will have a stroke if I don't have my cholesterol regularly checked

General intention

- Generally speaking, I intend to have my cholesterol checked
- It is likely that I will have my cholesterol checked regularly

6 month intention

- I intend to have regular cholesterol checks in the next 6 months
- It is likely that I will have my cholesterol checked regularly in the next 6 months

Benefits

- Having regular cholesterol tests will help me control my cholesterol levels
- I like low cholesterol food
- Having my cholesterol regularly checked will help me avoid future stroke
- Lowering my cholesterol levels is a good way for me to prevent stroke
- I have a lot to gain by controlling my cholesterol level

Barriers

- I would have to give up a lot to eat a low cholesterol diet
- It is difficult for me to eat a low cholesterol diet
- It is painful to have my cholesterol checked
- It is time consuming for me to organise a low cholesterol meal

Ease

- It would be easy for me to have regular cholesterol checks
- It would be hard for me to have regular cholesterol checks

Subjective norm

- Most people who are important to me would approve of me having my cholesterol checked regularly
- Most people who are important to me would want me to have my cholesterol checked regularly

Overweight –

Susceptibility

- The likelihood of having a stroke is high if I don't lose weight
- My chances of having a stroke are high if I don't lose weight
- I think it is likely I will have a stroke if I don't lose weight

General intention

4

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- It is likely that I will lose weight
- Generally speaking, I intend to lose weight
- 6 month intention**
 - I intend to lose weight in the next 6 months
 - It is likely that I will lose weight in the next 6 months
- Benefits**
 - I have a lot to gain from losing weight
 - My future will be healthier if I lose weight
 - Losing weight is a good way to prevent stroke
- Barriers**
 - Losing weight takes too much effort
 - Losing weight would require starting new habits which I would find difficult
 - I am afraid that I would not be able to lose weight
 - I would have to give up a lot to lose weight
- Ease**
 - It would be easy for me to lose weight
 - It would be hard for me to lose weight
- Subjective norm**
 - Most people who are important to me would approve of me losing weight
 - Most people who are important to me would want me to lose weight

Alcohol –

- Susceptibility**
 - It is likely that I will have a stroke if I don't reduce my drinking
 - My chances of having a stroke are high if I don't reduce my drinking
 - The likelihood of my having a stroke is high if I don't reduce my drinking
- General intention**
 - Generally speaking, I intend to reduce my alcohol drinking
 - It is likely that I will reduce my alcohol intake
- 6 month intention**
 - It is likely that I will reduce my alcohol intake in the next 6 months
 - I intend to reduce my alcohol intake in the next 6 months
- Benefits**
 - I can reduce my risk of stroke by not drinking too much
 - I have nothing to gain by drinking a lot of alcohol
 - The side effects from drinking lots of alcohol aren't pleasant to me
 - I don't enjoy drinking a lot of alcohol
- Barriers**
 - Reducing my alcohol intake would require too much effort
 - I like the effects of drinking alcohol too much to drink less
 - I enjoy drinking alcohol too much to drink less
 - My risk of stroke is not affected by how much alcohol I drink
- Ease**
 - It would be hard for me to reduce my drinking
 - It would be easy for me to reduce my drinking
- Subjective norm**
 - Most people who are important to me would want me to drink less alcohol
 - Most people who are important to me would approve of me reducing my drinking levels

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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 _____

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Stroke Risk Questionnaire: Part 1

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

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

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Stroke Risk Questionnaire: Part 1 Continued

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?	More often than prescribed	As often as prescribed	Less often than prescribed	Never	Not applicable
I monitor my blood pressure	☐	☐	☐	☐	☐
I test my blood sugar levels	☐	☐	☐	☐	☐
I take or inject my diabetic medication	☐	☐	☐	☐	☐
I take my blood pressure medication	☐	☐	☐	☐	☐
I take my irregular heart beat medication(s)	☐	☐	☐	☐	☐
I take my heart disease medication(s)	☐	☐	☐	☐	☐
I take medication(s) to reduce my risk of stroke	☐	☐	☐	☐	☐

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.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
If I had a stroke the consequences would be serious	☐	☐	☐	☐	☐
My life would be seriously affected if I had a stroke	☐	☐	☐	☐	☐
If I had a stroke, I would have to change a lot of things in my life	☐	☐	☐	☐	☐

Stroke Risk Questionnaire: Part 2 Continued

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

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
It would be easy for me to exercise regularly	☐	☐	☐	☐	☐
I have a lot to gain from exercising	☐	☐	☐	☐	☐
It is likely that I will undertake regular exercise in the next 6 months	☐	☐	☐	☐	☐
I am afraid to exercise	☐	☐	☐	☐	☐
It is likely that I will undertake regular exercise	☐	☐	☐	☐	☐
Exercise will help me avoid stroke	☐	☐	☐	☐	☐
Most people who are important to me would want me to exercise	☐	☐	☐	☐	☐
Exercising makes me feel better	☐	☐	☐	☐	☐
It is likely that I will have a stroke if I don't exercise regularly	☐	☐	☐	☐	☐
Generally speaking, I intend to undertake regular exercise	☐	☐	☐	☐	☐
It would be hard for me to exercise regularly	☐	☐	☐	☐	☐
The likelihood of my having a stroke is high if I don't exercise	☐	☐	☐	☐	☐
I don't have time to exercise	☐	☐	☐	☐	☐
Most people who are important to me would approve of me exercising	☐	☐	☐	☐	☐
Exercising interferes with my other activities	☐	☐	☐	☐	☐
I enjoy exercising	☐	☐	☐	☐	☐
I feel too embarrassed to exercise	☐	☐	☐	☐	☐
I intend to undertake regular exercise in the next 6 months	☐	☐	☐	☐	☐
Exercising can be painful for me	☐	☐	☐	☐	☐
My chances of having a stroke are high if I don't exercise regularly	☐	☐	☐	☐	☐

Stroke Risk Questionnaire: Part 2 Continued

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

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I have a lot to gain by giving up smoking	☐	☐	☐	☐	☐
The likelihood of my having a stroke is high if I don't stop smoking	☐	☐	☐	☐	☐
It is likely that I will stop smoking in the next 6 months	☐	☐	☐	☐	☐
Most people who are important to me would want me to stop smoking	☐	☐	☐	☐	☐
My risk of stroke would be less if I gave up smoking	☐	☐	☐	☐	☐
It would be hard for me to stop smoking	☐	☐	☐	☐	☐
I enjoy smoking too much to give it up	☐	☐	☐	☐	☐
I think it is likely I will have a stroke if I don't stop smoking	☐	☐	☐	☐	☐
Generally speaking, I intend to stop smoking	☐	☐	☐	☐	☐
It would be easy for me to stop smoking	☐	☐	☐	☐	☐
I would feel better if I stopped smoking	☐	☐	☐	☐	☐
It is likely that I will stop smoking	☐	☐	☐	☐	☐
My chances of having a stroke are high if I don't stop smoking	☐	☐	☐	☐	☐
Giving up smoking would require too much effort	☐	☐	☐	☐	☐
Giving up smoking will help my future	☐	☐	☐	☐	☐
Most people who are important to me would approve of me quitting smoking	☐	☐	☐	☐	☐
I am afraid to give up smoking	☐	☐	☐	☐	☐
I intend to stop smoking in the next 6 months	☐	☐	☐	☐	☐
My social life makes it hard to give up smoking	☐	☐	☐	☐	☐
I would find it distressing to give up smoking	☐	☐	☐	☐	☐

Stroke Risk Questionnaire: Part 2 Continued

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

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
It would be easy for me to have regular diabetes checks	☐	☐	☐	☐	☐
Most people who are important to me would want me to have regular diabetes checks	☐	☐	☐	☐	☐
The chances of me having a stroke are high if I don't have regular diabetes checks	☐	☐	☐	☐	☐
I intend to have regular diabetes checks in the next 6 months	☐	☐	☐	☐	☐
I think it is likely I will have a stroke if I don't have regular diabetes checks	☐	☐	☐	☐	☐
It is likely that I will have regular diabetes checks	☐	☐	☐	☐	☐
It would be hard for me to have regular diabetes checks	☐	☐	☐	☐	☐
I can benefit from regular diabetes checks	☐	☐	☐	☐	☐
I think it is likely I will have a stroke if I don't take my diabetes medications as prescribed	☐	☐	☐	☐	☐
The likelihood of my having a stroke is high if I don't have regular diabetes checks	☐	☐	☐	☐	☐
I am afraid to check my blood sugar level	☐	☐	☐	☐	☐
I find it too painful to check my blood sugar levels	☐	☐	☐	☐	☐
Generally speaking, I intend to have regular diabetes checks	☐	☐	☐	☐	☐
It takes too long to check my blood sugar levels for my diabetes	☐	☐	☐	☐	☐
Most people who are important to me would approve of me having regular diabetes checks	☐	☐	☐	☐	☐
It is likely that I will have regular diabetes checks in the next 6 months	☐	☐	☐	☐	☐

Stroke Risk Questionnaire: Part 2 Continued

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

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I am afraid to take my medication	☐	☐	☐	☐	☐
Generally speaking, I intend to take my medication as prescribed	☐	☐	☐	☐	☐
The likelihood of my having a stroke is high if I don't take my medication	☐	☐	☐	☐	☐
I worry less if I take my medication	☐	☐	☐	☐	☐
My chances of having a stroke are high if I don't take my medication	☐	☐	☐	☐	☐
Most people who are important to me would want me to take my medication	☐	☐	☐	☐	☐
I am embarrassed to take my medication	☐	☐	☐	☐	☐
I have a lot to gain by taking my medication	☐	☐	☐	☐	☐
It is likely that I will take my medication as prescribed in the next 6 months	☐	☐	☐	☐	☐
It would be hard for me to take my medication	☐	☐	☐	☐	☐
It is difficult to remember to take my medication	☐	☐	☐	☐	☐
I intend to have take my medication as prescribed in the next 6 months	☐	☐	☐	☐	☐
Most people who are important to me would approve of me taking my medication	☐	☐	☐	☐	☐
Taking my medication can make me feel ill	☐	☐	☐	☐	☐
I have to give up other activities to take my medication	☐	☐	☐	☐	☐
It would be easy for me to take my medications	☐	☐	☐	☐	☐
It is likely that I will have a stroke if I don't take my medication	☐	☐	☐	☐	☐
It is likely that I will take my medication as prescribed	☐	☐	☐	☐	☐
Taking my medication will prevent me from having a stroke	☐	☐	☐	☐	☐

Stroke Risk Questionnaire: Part 2 Continued

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

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Most people who are important to me would approve of me getting my blood pressure checked regularly	☐	☐	☐	☐	☐
Generally speaking, I intend to have my blood pressure checked regularly	☐	☐	☐	☐	☐
I have a lot to gain by controlling my blood pressure	☐	☐	☐	☐	☐
The likelihood of my having a stroke is high if I don't have my blood pressure checked regularly	☐	☐	☐	☐	☐
I intend to have regular blood pressure checks in the next 6 months	☐	☐	☐	☐	☐
It would be hard for me to have regular blood pressure checks	☐	☐	☐	☐	☐
I think it is likely I will have a stroke if I don't have my blood pressure regularly checked	☐	☐	☐	☐	☐
Checking my blood pressure regularly will help me prevent future stroke	☐	☐	☐	☐	☐
It would be easy for me to have regular blood pressure checks	☐	☐	☐	☐	☐
Attending appointments for blood pressure checks is time consuming for me	☐	☐	☐	☐	☐
Controlling my blood pressure is a good way to avoid stroke	☐	☐	☐	☐	☐
My chances of having a stroke are high if I don't have my blood pressure regularly checked	☐	☐	☐	☐	☐
It is likely that I will have my blood pressure checked regularly in the next 6 months	☐	☐	☐	☐	☐
Most people who are important to me would want me to get my blood pressure checked regularly	☐	☐	☐	☐	☐
I find it difficult to attend appointments for blood pressure checks	☐	☐	☐	☐	☐
I am afraid to have my blood pressure checked	☐	☐	☐	☐	☐
Having blood pressure checks are painful	☐	☐	☐	☐	☐
It is likely that I will have my blood pressure checked regularly	☐	☐	☐	☐	☐
It is embarrassing for me to have my blood pressure checked	☐	☐	☐	☐	☐

Stroke Risk Questionnaire: Part 2 Continued

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

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

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
It would be easy for me to lose weight	☐	☐	☐	☐	☐
I have a lot to gain from losing weight	☐	☐	☐	☐	☐
I intend to lose weight in the next 6 months	☐	☐	☐	☐	☐
Losing weight takes too much effort	☐	☐	☐	☐	☐
Most people who are important to me would approve of me losing weight	☐	☐	☐	☐	☐
Losing weight would require starting new habits which I would find difficult	☐	☐	☐	☐	☐
It would be hard for me to lose weight	☐	☐	☐	☐	☐
It is likely that I will lose weight	☐	☐	☐	☐	☐
I am afraid that I would not be able to lose weight	☐	☐	☐	☐	☐
It is likely that I will lose weight in the next 6 months	☐	☐	☐	☐	☐
My future will be healthier if I lose weight	☐	☐	☐	☐	☐
The likelihood of having a stroke is high if I don't lose weight	☐	☐	☐	☐	☐
Most people who are important to me would want me to lose weight	☐	☐	☐	☐	☐
I would have to give up a lot to lose weight	☐	☐	☐	☐	☐
Generally speaking, I intend to lose weight	☐	☐	☐	☐	☐
My chances of having a stroke are high if I don't lose weight	☐	☐	☐	☐	☐
Losing weight is a good way to prevent stroke	☐	☐	☐	☐	☐
I think it is likely I will have a stroke if I don't lose weight	☐	☐	☐	☐	☐

Stroke Risk Questionnaire: Part 2 Continued

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

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

You are now beginning Part Three

Stroke Risk Questionnaire: Part 3

Everyone should answer these questions. Please tick the box you think is correct.

1. 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
2. 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
3. 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
4. Which age group is more at risk of stroke?
 - ☐ 20-30
 - ☐ 31-50
 - ☐ 51-60
 - ☐ 61+
 - ☐ I don't know
5. 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
7. 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
8. 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
9. 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
10. 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.

11. 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
 - ☐ Four times as likely to suffer stroke
 - ☐ I don't know
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

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

Again, we sincerely thank you for your time and thoughtful responses.