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Cognitive Health And African American Elders Study: Knowledge, Attitudes And Practices

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COGNITIVE HEALTH AND AFRICAN AMERICAN ELDERS STUDY:
KNOWLEDGE, ATTITUDES AND PRACTICES

by

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DEDICATION

To my true parents, Lula Launa and Peter James Douglas. I came into the world under less than ideal circumstances and you loved me to life. You taught me not to bend, you taught me not to break, you taught me how to stand tall against the wind. You took care of me when I had no teeth and I am blessed that I could do the same for you. Together we fought Alzheimer's disease and during this fight of fights, you showed me who I am and reminded me of the shoulders upon which I stand. It is because of your love and grace that all that I am destined to achieve is possible. This work is for you.

To Dr. Michael Bennett (Uncle Dr. b), there will never be words big enough to express my deep and sincere appreciation for all that you have given me. You are my light when the darkness threatens to overwhelm me and a voice of reason when all hope seems lost. You inspired me to stay the course and trust with absolute certainty that I had all that I needed to speak power to truth. You dared me to become great, to challenge myself to learn, and think and achieve. Your stories inspired me and I look forward to all that we will accomplish as activist scholars, doing the work that the world needs done.

To the 120 elders who took part in this research. Thank you seems too small a word to fully convey my appreciation for your support. I am grateful to have you all standing with me in the fight against Alzheimer's disease in our community. Your words of wisdom, faith, and spirit of perseverance encouraged and inspired me, especially in moments when it seemed that I would not achieve my goal. I greatly appreciate the conversations that we shared and the trust that you have placed in me to bear witness to your stories.

A very special thank you to my tribe. Though small in number, you are mighty in spirit and I could not have sustained myself without you. Thank you for answering my calls no matter the day or hour and for being willing to do what was necessary to help me to say in the fight.

To my committee; Dr. Janet R. Hankin, Dr. Peter A. Lichtenberg, Dr. Zachary W. Brewster, and Dr. Dave M. Merolla. I greatly appreciate the time, patience and encouragement that each of you gave so freely. To Dr. Mary Cay Sengstock, thank you for encouraging me to do what I feared most and I hope that the presentation slides met with your approval.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

What is Cognitive Health?

In the Centers for Disease Control (CDC) and the Alzheimer's Association 2007 report titled *The Healthy Brain Initiative: A National Public Health Road Map to Maintaining Cognitive Health*, indicates that "a healthy brain can perform all the mental processes that are collectively known as cognition, including the ability to learn new things, intuition, judgement, language, and remembering." (Alzheimer's Association, 2007, p. 8) Moreover, the report indicates that "cognitive health should not be assessed solely by the absence of disease, such as dementia but should also consider the normal changes that occur as part of the aging process." (Alzheimer's Association, 2007, p. 8). Researchers argue that there is a spectrum of cognitive health. As illustrated in Figure 1. below, cognitive health encompasses all the changes in cognitive function that occur over time which can range from optimal, to mild impairment no dementia, to severe dementia. (Alzheimer's Association, 2007, p. 8). Normal cognitive aging may include gradual changes in reasoning, attention and memory. The changes that accompany cognitive impairment no dementia are more severe than normal cognitive aging but not as severe as dementia, which is characterized by significant changes in behavior as well as drastic declines in occupational and social functioning (Alzheimer's Association, 2007). A subsequent report (2013) provides an update on the initiative and also addresses the role that state and local community agencies can play in the fight against cognitive impairment. Age is the most significant link to developing cognitive impairment and dementia. While most older adults live without cognitive impairment or dementia, estimates indicate that in 2013, 5 million Americans aged 65 and older have AD (Alzheimer's Association, 2013).

Figure 1. Spectrum of Cognitive Health

Normal Cognitive Aging	Cognitive Impairment no Dementia	Dementia
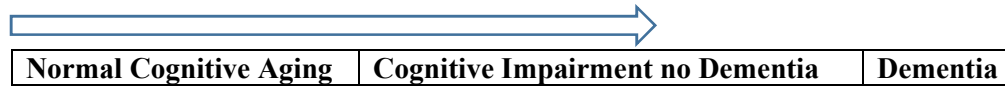
(Adapted from Smith, 2016)

The present study examines the relationship between subjective cognitive health, socioeconomic status, knowledge, attitudes and practices related to cognitive health among a sample of African American women. Based on definitions established by the CDC and Alzheimer's Association, subjective cognitive health is a self-reported measure of cognitive function which includes memory, judgement, language, and the ability to learn new things. Several key terms will be used throughout this dissertation to address my research questions. Knowledge is a set of understanding or a way of perceiving. Attitudes are ways of being or 'tendencies' which may not be directly observable. Practices are observable actions by an individual relative to cognitive decline. (Gumuccio et al., 2011, pg. 1)

This chapter discusses the following: (1) definitions of cognitive impairment and dementia; (2) cognitive impairment and dementia among older African Americans; (3) factors associated with increased risk for cognitive impairment and dementia, Alzheimer's disease in particular, among older African Americans; (4) the role of socioeconomic status (SES); (5) specific aim of the present study and (6) significance of the present study.

Cognitive Impairment (CI) and Dementia

While the definition of cognitive impairment (CI) is evolving, the CDC characterizes cognitive impairment (CI) as "difficulty remembering, learning new things, concentrating or making decisions that affect daily life." (CDC, 2011, p1). Similarly, the Alzheimer's Society defines CI as "changes in memory that are more frequent or exceed what is expected for an individual at a particular age." (2015, p.1) Both suggest that CI is considered as the stage midway

between changes due to normal cognitive aging and dementia. Severity of CI can range from mild, moderate, severe and profoundly severe and research suggests that CI is different from dementia. Research by the CDC, (2011) suggests that a key differences between CI and dementia is that CI does not interfere with independence activities in daily life such as cooking, driving, shopping, and managing personal finances. Furthermore, research suggests that while CI may not lead to dementia, most diagnosed cases of Alzheimer's disease (AD) began with CI. (Alzheimer's Association, 2016).

According to the Alzheimer's Association (2016) dementia is the universal term used to describe severe changes in memory, communication and thinking. While there are several types of dementia, AD is the most common and accounts for approximately 60 to 80 percent of cases (Alzheimer' Association, 2016). Vascular dementia is the second most common type of dementia.

Current research suggests that CI and dementia, such as Alzheimer's disease are the leading causes of disruptions in cognitive health (Alzheimer's Association, 2010). The present state of science is advancing knowledge about the etiology of these diseases, and autopsy studies of people diagnosed with either CI or dementia indicates that there are observable changes in brain anatomy. Brain changes that are associated with CI include: (1) plaques throughout the brain, (2) shrinkage in the hippocampus, which is important to memory, (3) enlargement of the ventricles and (4) reduction in glucose levels, which is the primary source of energy for brain cells. Similarly, there are observable brain changes for dementia. There are several types of dementia and the two most common types are Alzheimer's disease (AD) and vascular dementia. Brain changes that are associated with dementia, AD in particular can include: (1) a build-up of plaques on the synapses, which interfere with the brain's ability to transfers information from cell to cell, (2) a degeneration of microtubules, necessary for transporting nutrients to the brain, and (3) brain inflammation.

Moreover, in advance cases of AD, the brain shrinks. Consequently, brain cells become damaged and prevents normal communication, recall and thinking abilities. (Alzheimer's Association, 2011)

Although exact prevalence rates of CI are difficult to determine due to differences in criteria used define the disease and clinical assessment methods, the CDC (2011) estimates that approximately 16 million Americans are facing the challenges associated with CI. Furthermore, a report by the U.S. Preventive Task Force (USPTS, 2014) suggests that rates of CI range from 3% to 45% among older adults aged 65 and older.

To date, research has uncovered racial disparities associated with the prevalence of dementia and found higher prevalence rates of Alzheimer's disease (AD) among African Americans (Potter et al., 2009). Specifically, recent estimates indicate that over 20% of older African Americans (aged 71 and older) have AD; compared with just 11% of their white counterparts (Alzheimer's Disease Facts and Figures, 2010). Zhang et al. (2016) report that prevalence rates for CI among older African Americans 23.3% compared to 8.8% for Whites (Alzheimer's Association, 2010). Furthermore, a 2002 report from the Alzheimer's Association described AD in the African American community as an "emerging public health crisis". The report indicated that the prevalence, incidence and overall risks of AD and perceived cognitive impairment are much higher in the African American community (Alzheimer's Association, 2002). In addition to the risks associated with advancing age, studies suggest that higher rates of cognitive impairment and dementia among African Americans can also be explained by differences in the presence of preventable diseases associated with AD such as hypertension and diabetes, and socioeconomic differences such as education level and quality (Alzheimer's Association, 2010).

Risks Factors for CI and Dementia, AD in Particular

As previously stated, AD is the most common type of dementia. Research on AD indicates that the progressive nature of the disease is surpassing knowledge about the disease, advances in identifying causes and cures, and availability of sustainable resources, both monetarily and in terms of social support. Consequently, initiatives such as the Centers for Disease Control (CDC) Healthy Brain Initiative and forums such the Alzheimer's Association International Conference (AAIC) are evidence of the concern about the proliferation of AD, especially among African Americans. The CDC and the Alzheimer's Association reported that African Americans may be a high risk for cognitive impairment due to risk factors including vascular disease, hypertension, and diabetes (2007). To address this disparity, a core element of The Healthy Brain Initiative (2005 to 2007) focused on assessing how cognitive health is perceived, especially among understudied populations, and identifying targeted measures to educate these populations on preventing cognitive impairment. Risk factors for dementia, AD in particular, include age, gender, and family history. Like CI, lifestyle factors such as diabetes; hypertension, elevated cholesterol, have been linked to AD. According to AAIC (2011) researchers, a majority of the AD cases in the United States could be traced to treatable conditions such as low physical activity, depression, smoking, mid-life hypertension, obesity, low education and diabetes. AAIC researchers suggest that lifestyle changes and treatment of preventable diseases are critical to reducing risk factors for AD.

Factors associated with increased risk of CI and Dementia among older African Americans

Although the reasons underlying higher reported incidence and prevalence of dementia, AD in particular, among African Americans is unclear, findings from the AAIC about risk factors for cognitive decline are significant. Data from the Third National Health and Nutrition Survey

(NHANES III) indicates that African Americans had a prevalence of five vascular risk factors associated with stroke: hypertension, diabetes, physical inactivity, obesity, and diabetes which are also linked to risk of cognitive decline. Furthermore, a report from the Joint National Committee on Hypertension indicated that hypertension among African Americans appears earlier; goes untreated longer and results in one of the highest prevalence rates of hypertension compared to other groups. Research suggests that the cumulative risks for vascular disease increase the risk for cognitive decline and also indicates an association between vascular health and cognitive health (CDC, 2007; Alzheimer's Association, 2007; Buchner et al., 2007).

Underrepresentation of African Americans in clinical research on CI

While clinical research on cognitive impairment is increasing and the scientific community has made strides in developing pharmaceutical treatments and experimental therapies, the underrepresentation of African Americans in research on cognitive impairment remains problematic (Alzheimer's Association, 2010). For example, data gathered for The National Institute on Aging, the Alzheimer's Disease Cooperative Study, and pharmaceutical companies to assess participation of African Americans in clinical trials indicated that only 3.6% of the sample population represented nonwhite participants (Danner et al., 2011; Faison et al., 2007).

The Role of Socioeconomic Status (SES)

In addition to biomedical advances in maintaining cognitive health, equal attention needs to be placed on the impact of SES on perceptions and responses to cognitive decline and impairment among African Americans. The role of SES in health status across various social groups has been described by Fundamental Causes Theory (Phelan and Link, 1995, 2010). According to Phelan and Link's Fundamental Causes Theory (1995, 2010), there is an association between SES and health status. Specifically, the theory states that an ongoing association exists

between SES and health status because SES incorporates multiple key resources such as money, knowledge, prestige, power, and beneficial social connections that protect health no matter what mechanisms are relevant at any given time. Link and Phelan argue that these resources are flexible and occur at both individual and contextual levels. Central to Fundamental Causes Theory is the premise that lower SES individuals lack flexible resources and consequently experience negative health outcomes compared to higher SES individuals.

Research which tests the Fundamental Causes Theory (Luftey and Freese, 2005; Phelan et al., 2004; Polonjo et al., 2013) demonstrate a link between SES and disparities in health outcomes. Although the studies focus on different types of health outcomes, the common findings support the premise of Fundamental Causes Theory. In studies of diabetes, rates of mortality, and access to new health innovations, higher SES individuals experienced better health outcomes relative to lower SES individuals. Given the prevalence of cognitive impairment among African Americans, my research seeks to examine the role of SES on knowledge, attitudes and behaviors associated with cognitive decline among a sample of older African American women to measure intra group differences. Specifically, my research seeks to explore how a range of SES factors impact on knowledge, attitudes, and practices associated with maintaining cognitive health.

To date, there has been limited research on whether beliefs about cognitive health and responses to cognitive decline differ by social class within the African American community. (Barnes et al., 2011). Specifically, few studies have examined how social class impacts access to and development of knowledge, attitudes, and practices regarding the promotion of cognitive health among African Americans.

A substantial body of literature suggests that cognitive impairment and dementia disproportionately affects African Americans. This dissertation will focus on the gap in research

on cognitive health among older African Americans. It assesses the relationship between socioeconomic status and knowledge, attitudes, and practices associated with maintaining cognitive health among older African American women. Specifically, this study will examine whether the relationship between socioeconomic status (SES) and behaviors associated with maintaining cognitive health among a sample of older African American women is related to knowledge and attitudes regarding cognitive health.

Specific Aims

Based on findings from focus group data (Connell et al., 2007; Wilcox et al., 2009) I hypothesize that SES impacts on access to resources; both knowledge and practices, and the cumulative effects of these constraints impact attitudes associated with cognitive health among older African Americans. The Knowledge, Attitudes, and Practices Model (KAP) has not been used to examine subjective cognitive health. Given the risk of cognitive impairment and dementia among older African Americans, the specific aims of this research are to:

Aim One: Explore the link between SES, as measured by education and income, and awareness of factual knowledge about AD.

I hypothesize that education and income are associated with knowledge about maintaining cognitive health and preventing future cognitive decline. Specifically, higher SES individuals will have greater access to resources that serve to increase their knowledge about maintaining their cognitive health, as well as preventive health behaviors that reduce the risk of cognitive decline.

Aim Two: Explore the link between SES, as measured by education and income, and attitudes about cognitive decline.

I hypothesize that education and income impacts attitudes about cognitive decline. Specifically, the combined effects of education level and income are related to how individuals

feel about their cognitive decline. High SES individuals will have lower perceived risk of developing CI due to the availability of resources which promote the prevention of cognitive decline. Conversely, low SES individuals will higher perceived risks of developing CI due to the combined effects of low education level and income constraints, which limit access to knowledge and practices associated with maintaining cognitive health and preventing cognitive decline.

Aim Three. Investigate the relationship between SES, as measured by education and income, and practices associated with maintaining cognitive health.

I hypothesize that education and income level influences engagement in health behaviors which promote cognitive health. To this end, high SES individuals, due to their increased factual knowledge and lower perceived risk, will be more likely to routinely engage in activities which contribute to better cognitive health and reduces the risk of future cognitive decline. Moreover, low SES individuals, will be less likely to engage in preventative health behaviors due to limited access to resources.

Aim Four. Examine whether the combined effect of SES and knowledge, attitudes and practices are linked to subjective cognitive health.

I hypothesize that SES, as measured by education and income, and knowledge, attitudes and practices are related to perceptions about their cognitive health. Higher SES individuals will report better cognitive health, possibly due to greater knowledge about maintaining their cognitive health and preventing future cognitive decline. Higher SES women will be more likely to routinely engage in preventive health behaviors which may relate to improved cognitive health. In contrast, lower SES individuals will have less optimistic perceptions about their cognitive health that may be associated with the cumulative effects of limited knowledge about maintaining

cognitive health, less optimistic attitudes about cognitive decline, and lower engagement in preventive health behaviors.

Significance of the Present Study

While cognitive impairment and dementia impacts the older population, and prevalence rates increase with age, research suggests that prevalence rates are higher among African Americans than for whites. According to the Alzheimer's Association (2006), prevalence rates of cognitive impairment for adults aged 65 was 8.8% for whites and 23.9% for African Americans. Furthermore, studies suggest that rates for dementia, Alzheimer's disease (AD) in particular, is nearly twice the rate compared to whites.

The Alzheimer's Association estimates that by 2030, 71.5 million Americans will be aged 65 and older – the age of risk for cognitive impairment and dementia (Alzheimer's Association, 2007). In 2010, the cost associated with providing care for individuals diagnosed with AD and CI was $172 billon and this is projected to double every 10 years (Alzheimer's Association, 2010). As the cumulative risk of cognitive impairment continues to be much higher within the African American community, this research will shed light on developing targeted interventions for preventing or mitigating cognitive impairment. Specifically, this research will explore the intersections between SES and knowledge, attitudes, and practices associated with maintaining cognitive health and findings have the potential to be guide future research and inform policies related to national initiatives focused on increasing awareness of cognitive health among diverse groups. Furthermore, this is the first study to apply KAP Model to the study of cognitive health.

Chapter 2 discusses literature across four domains: (1) CI among African Americans, (2) Dementia, AD in particular among African Americans (3) the role of SES on cognitive health and (4) the KAP Model and it is utility in research on cognitive health. Chapter 3 provides an overview

of the study sample; data collection procedures, instrumentation, variables, KAP scales construction and summary of analytic strategy. Chapter 4 summarizes results of the sociodemographic analyses and the KAP scales. Chapter 5 discusses the multivariate analyses conducted to test my research hypotheses. Chapter 6 offers conclusions and suggestions for further research. Appendix A includes the IRB Approval Form, and the oral and written consent forms. Appendix B includes the approved survey instrument.

CHAPTER 2: LITERATURE REVIEW

In 2014, a report from the Administration for Community Living indicated that the African American older population (aged 65 and older) was 4 million. By 2060, this estimate is projected to triple and older African Americans will be approximately 12% of the American population aged 65 and older (U.S. Census, 2015). As the older African American population increases, the number who develop CI and dementia escalates. Findings from the 2006 Health Retirement Survey (HRS) indicates that prevalence rates of cognitive impairment for adults aged 65 and older were 8.8% for whites and 23.9% for African Americans (Alzheimer's Association, 2011). Furthermore, the findings indicate that the rate of CI is threefold higher and the rate of AD is twice as high among African Americans compared to whites.

Given this racial disparity in prevalence rates of CI and dementia, AD in particular, there is an urgent need to increase awareness about cognitive health and develop targeted intervention strategies for aging African Americans. To date, there is limited research on how African Americans view cognitive health, their attitudes about cognitive decline, and the impact of SES on mechanism associated with promoting and maintaining cognitive health. Furthermore, no study has proposed the Knowledge, Attitudes, and Practices (KAP) Model as a framework for examining the interrelationships between these domains. This chapter addresses gaps in the current literature and examines four areas: (1) CI among African Americans (2) AD among African Americans, (3) the role of SES on cognitive health as framed by the Fundamental Causes Theory and (4) the KAP Model as a methodological approach for predicting subjective cognitive health among older African Americans.

CI among African Americans

Despite research which suggests disparities in prevalence rates, few studies have examined CI among older African Americans. Within the limited literature, findings indicate that in addition to susceptibility to health factors which may predispose African Americans to CI, there is also a link between education level and quality and an increased risk for CI.

Manly et al. (2002) assessed differences in performance on cognitive testing between a sample of African American and whites aged 65 and older. Specifically, the study sought to examine whether inter group differences in cognitive test performance among African Americans and Whited is linked to differences in quality of education (i.e. length of school year, access to educational resources). The study utilized a longitudinal design and participants were recruited from the Washington Heights-Inwood Columbia Aging Project (WHICAP). WHICAP is community based study of dementia among African Americans, Hispanics, and Whites in northern New York. Prior to the study, participants completed a medical evaluation which included neurological and physical examinations and functional status as measured by the Blessed Dementia Rating Scale (BDRS) Cognitive function was evaluated using multiple measures which included learning and memory, orientation, abstract reasoning, language and visuospatial capacity. Reading level was measured using a subtest from the Wide Range Achievement Test (WRAT) and word recognition was measured using the Selective Reminding Test (SRT). The sample included 565 participants; 56% were African American and 44% were white. The majority of the sample were female; 76% of African American respondents were women and 60% of white participants were women. The sample was stratified by race, sex, and education level to create two matching groups on education and sex and an equal number of participants were selected within each category. Findings showed a significant difference in reading scores between African

Americans and Whites. Specifically, African Americans scored lower than Whites despite having similar levels of education. Based on this examination of educational quality, the authors concluded that it is possible a more accurate measure of education rather than years of education.

In a similar study, Manly et al. (2003) examined the relationship between quality of education as measured by literacy level and cognitive decline. Specifically, the study sought to explore whether literacy is a stronger correlate of cognitive decline than years of education. As in the previous study, the study utilized a longitudinal design and participants were recruited from WHICAP. The sample included 136 ethnically diverse participants aged 65 and older and prior to the study, all participants completed a medical evaluation. Reading level was measured using the Reading Recognition subtest from the Wide Range Achievement Test (WRAT, Version 3) and word recognition and memory was measured using the Selective Reminding Test (SRT). The sample was stratified into two literacy groups (high literacy and low literacy) based on scores from the WRAT. The high literacy group was 61% White, 39% African American and 0% Hispanic. The low literacy group was 24% Whites, 67% African American, and 9% Hispanic. Compared to the high literacy group, the low literacy group had less years of education and were also ethnic minorities. Findings indicated that both groups showed declines in memory over time, however, the decline among the low literacy group was more immediate based on results from the SRT. Based on these findings, the authors suggest that high literacy skills may serve as a protective factor which can slow down the process of age related cognitive decline. Hence, literacy skills may be a more sensitive measure of cognitive decline than years of education.

Furthermore, Mehta et al. (2004) assessed differences in performance on cognitive function test scores between African Americans and Whites. Participants were recruited from the Health, Aging, and Body Composition (Health ABC) study, a longitudinal cohort of older adults

aged 70 to 79 and focuses on changes in body composition over time. Recruitment took place at centers in Pittsburgh, Pennsylvania and Memphis, Tennessee and included 3.062 participants all meeting the inclusion criteria at baseline in 1997-1998. Well-functioning participants (able to walk one-quarter of a mile; climb ten steps without resting, engage in activities of daily living without assistance and walk with an assistive aid) were included in the study. Within the sample, 41.5% were African American and 58.4% were White. The majority of the sample was female. Cognitive function was evaluated using the modified Mini Mental State Examination (3MMM) and the Digital Symbol Substitution test (DSS). On both measures, a higher score indicated better cognitive function. Participants also provided self-reported information on their health status, inventory of medications, and access to social support. The Center for Epidemiological Studies-Depression (CES-D) was used to measure depression and a higher score was associated with more depressive symptoms. Findings indicate that compared to Whites, African Americans had lower level of education, income and literacy scores. Furthermore, findings were consistent with previous studies and indicate that African Americans have lower scores on cognitive function compared to their White counterparts. However, when sociodemographic factors, literacy and financial sufficiency were considered, the differences between the groups were attenuated. To this end, the authors argue that literacy is linked to cognitive test performance, and in addition to other socioeconomic factors, mediates differences in scores between African Americans and Whites.

Additionally, Sloan et al. (2005) examined racial and ethnic differences in cognitive function based on cross sectional and longitudinal data from the Health and Retirement Study (HRS) and the Assets and Healthy Dynamics of the Oldest Old (AHEAD). Data were collected during four waves (1993, 1995, 1998, and 2000) and the sample included 19,964 participants 70 years of age and older however, the exact proportion of African Americans is not specified.

Cognitive function was assessed using the Telephone Interview for Cognitive Status (TICS) and included questions on word recall; memory tests, tests of knowledge, language and orientation, and a measure of ability to perform instrumental activities of daily living (IADL) was also administered. Overall, findings indicated that higher age, lower education level, and poor health resulted in lower cognitive function scores. Furthermore, findings from longitudinal analysis are consistent with prior studies and that show differences in cognitive test scores between African Americans and Whites. Specifically, Whites scored higher on performance of cognitive tests compared to African Americans. Similar to previous studies, the authors suggest that SES impacts on cognitive health outcomes. To this end, findings suggest that low education level and low income in early or mid-life may be associated with poor health and cognitive decline in later life.

In another study, Garnaldo et al. (2010) examined cognitive impairment among older African Americans to assess frequency of mild cognitive impairment (MCI). Participants were recruited from the Baltimore Study of Black Aging: Patterns of Cognitive Aging (BSBA: PCA), which focuses on cognition, health and social factors which impact on aging within the African American community. The sample included 554 independently living, urban dwelling African Americans ranging in age from 50 to 95. Within the sample, 76% were female and 24% were male. Cognitive function was evaluated by using the Mini-Mental State Examination (MMSE) and the Short Portable Mental Status Questionnaire (SPMSQ). The Center for Epidemiological Studies-Depression (CES-D) was used to measure depression and three assessments were conducted of participants' blood pressure prior to the study. Composite scores of the cognitive tests were calculated and cognitive impairment was determined based on previously validated criteria used to evaluate cognitive decline. MCI status was determined if participants indicated impairment on one of the cognitive domains (i.e. language, memory, reasoning, executive

functioning and perceptual speed). Based on this evaluation, two groups were created; amnestic MCI (memory loss) and non-amnestic MCI (no memory loss). Findings indicated that within the sample, 22% were considered as MCI (4% of the sample qualified as amnestic MCI; 18% were non-amnestic). Furthermore, the non-amnestic group had more years of education which suggests that quality/level of education may contribute to the frequency of diagnosis of cognitive impairment and also serve as an indicator of cognitive decline.

Furthermore, Sheffield et al. (2011) assessed trends in prevalence rates cognitive impairment among older adults from 1993-2004. Utilizing longitudinal data from the Health and Retirement Study (HRS) and the Assets and Healthy Dynamics of the Oldest Old (AHEAD), the study explored disparities in intergroup rates of CI and the impact of socioeconomic status. Data were collected during six waves and included a representative sample of the noninstitutionalized adults aged 70 and older who identified as White, African American, or Hispanic. Cognitive function was measured by a modified version of the validated Telephone Interview Cognitive Screen (TICS) and participants provide self-reported health status information. According to the study, rates of CI during the time period decreased for all groups, and improvements were most significant among African Americans. In 1993, rates of CI for African Americans was 15.91%, compared with 2.89% for whites. The data indicates that by 2004, there was considerable decline; 5.92% of African Americans were cognitively impaired compared to 1.55% for whites. The authors noted a link between education and optimal cognitive function over the life course and suggested that improvements in levels and quality of education among African Americans may have attributed to declines in prevalence rates of CI.

In a different study, Barnes et al. (2011) assessed racial differences between older African Americans and whites in physical and cognitive function in relationship to education. Specifically,

the study examined the link between education and physical and cognitive function to better understand the interaction between race and level of education on physical and cognitive function. Using longitudinal data from the Chicago Health and Aging Project (CHAP), which focuses on risk factors for AD, the sample included 9,534 adults aged 65 and older. Within the sample, 64% were African American and 60.4% were women. Cognitive function was measured by four performance tests which included test of episodic memory; perceptual speed, and the Mini Mental State Examination. Physical function was measured by three performance tests which included tests of strength, balance and gait; walking, and chair stands. Similar to other studies, findings indicated a differences in these outcomes of physical function and cognitive function between the groups and a link between education level. Specifically, when compared to Whites at a similar education level, African Americans had lower scores on both physical and cognitive function. Furthermore, findings indicated that for both groups at low education levels, there was no difference in scores on physical gait and cognitive function. Among African Americans, the findings suggest that years of education was positively associated with better scores for physical and cognitive function. The authors suggest that one possible explanation for the difference is that combined effects of poverty and racial discrimination precipitates disadvantages which lead to poor health outcomes for African Americans. Another explanation is that differences in the quality of education and access to educational resources, due to segregation and institutional racism may have had a negative effect on long term cognitive development.

In a recent study, Zhang et al. (2016) examined prevalence rates of CI among older Americans framed by the Life Course Perspective. According to the study, there is evidence of a link between cognitive impairment in later life and childhood conditions. Specifically, research suggests that adversity in childhood, such as poverty, poor nutrition and poor health, may have

direct effects on brain growth and development and may also exacerbate risk factors for CI in later life. Similarly, SES as measured by educational attainment, may also be associated with susceptibly to CI in later life. Education in early life may serve to mediate cognitive decline in later years such that individuals with higher levels of education have better cognitive reserve throughout the life course. Furthermore, higher levels of education are associated with occupations that require greater cognitive capacity and also influences participation in health behaviors that promote cognitive health. Utilizing seven waves of HRS data (1998-2010), the sample include 8,946 noninstitutionalized adults aged 50 and over. Within the sample, 13.5% were African American. Cognitive function was measured by a modified version of the validated Telephone Interview for Cognitive Status (TICS). Key findings are consistent with other studies which examine disparities in prevalence rates of CI among African Americans. Specifically, findings indicated that the rate of cognitive impairment among African Americans is more than three times the rate among Whites (10.58% for African Americans and 3.09% for Whites). Based on the Life Course Perspective, social disadvantages in childhood predisposes African Americans to life circumstances in which they are more likely to have lower SES and low levels of education compared to Whites. Consequently, the cumulative effects of life long disadvantage may be a precursor to the increased risk of CI in late life.

Alternatively, Ficker et al. (2014) suggests that education level may not explain differences in CI among African Americans. Given that the cumulative risk of CI and dementia is higher among African American, the study sought to explore the relationships between perceptions about cognitive decline and other health factors associated with maintaining optimal cognitive function. The study included 501 urban dwelling African American adults aged 55 to 95. Within the sample, 82% were females and most had 12 years of education or more. The

authors assert a key difference between subjective memory complaints (SMC) and perceived cognitive impairment (PCI) is related to instrumentation such that measures of are more sensitive for assessing indicators of PCI. Other differences identified by prior research indicates that SMC can occur at any age and may emerge as a result of distress as opposed to actual cognitive decline. SMC may be linked to geriatric depression. and among older adults, SMC can lead to greater risk of developing cognitive impairment. Perceived cognitive impairment, on the other hand, draws on the individuals' emotional, social and environmental experiences which influence perceptions about changes in memory and thinking. Moreover, perceived cognitive impairment considers declines in cognitive function, during the previous year, which significantly impact on normal activities of daily living. The study utilized a composite survey with measures for perceived cognitive impairment; depression, social functioning, cardiovascular risk factors, health and mobility problems, and chronic pain. According to the findings, one-third (29%) of participants reported experiencing PCI; which is higher than rates for older African Americans across Michigan. In addition, the findings suggest the PCI is multifaceted and may be linked to other of health factors such as mental health and mobility. Different than other studies, findings suggest that stressful life events are associated with poor health outcomes and may be more closely correlated to perceived cognitive impairment rather than quality or level of education.

Sampling and culturally relevant measures remain a challenge to research on CI among African Americans. While the researchers attempted to use representative samples, difficulties in recruiting African American participants persists and resulted in smaller samples of African American participants compared to Whites. Also, accessing instruments that accurately reflect the lives and experiences of minority groups in culturally relevant ways is another limitation for future

research. As a result of these methodological challenges, generalizability of findings is often limited.

AD among older African Americans

AD is the most common type of dementia and an emerging theme in the literature suggests disparities in incidence and prevalence rates of AD, particularly among African Americans and whites. According to the 2010 Alzheimer's Association Special Report: *Race, Ethnicity and Alzheimer's Disease,* rates of AD are two to three time higher among African Americans when compared to whites (Alzheimer's Association, 2010). While results from several populations based studies have shown consistent findings, there is also research where no racial differences in AD prevalence and incidence have been found once controls for SES are introduced.

Findings from The Aging, Demographics and Memory study (ADAMS, Plassman et al., 2007) provides empirical evidence for the Alzheimer's Association 2010 report. The ADAMS study examined the prevalence of AD and other dementia in the United States. The study utilized data from the HRS and included 856 participants aged 71 and older. Within the sample, 7.6% were African American; 87.1% were White, and 5.2% were Hispanic. In home evaluations for dementia were conducted by a nurse and neuropsychology technician from July 2001 to December 2003. Information was collected on participants' medical history; medication use, history of cognitive and functional symptoms, family history of memory problems, neuropsychiatric symptoms (NSP), and history of severity of cognitive and functional impairment. Assessments included a self-reported measure for depression; blood pressure measure, neurological and neuropsychological evaluations, and collection of buccal DNA for apolipoprotein E (APOE) genotyping. In addition, access to medical records was requested so that laboratory results from previous brain scan could be reviewed if necessary. The data was reviewed by a team of experts

which included a geropsychiatrist; neurologist, neuropsychiatrist, a cognitive neuropsychiatrist, and the nurses and neuropsychology technicians. Preliminary diagnoses were assigned and then forwarded to a consensus panel of experts for review and final diagnosis. During consensus expert review, cases were initially reviewed without medical records, and then reviewed with medical records. Based on established criteria, final diagnoses fell into three categories: normal cognitive function, cognitively impaired but not demented (CIND), and dementia. Analyses were conducted to estimate prevalence rates of AD and vascular dementia (VaD) based on prior research from postmortem examinations and established criteria in the DSM-III. Consistent with other studies, findings indicate that compared to Whites in the same age group, African Americans aged 71 and older have an increased risk for dementia. Furthermore, data suggest that African Americans aged 71 and older are approximately two time more likely to have AD compared to Whites; 21.3% for African Americans and 11.2% for whites. According to the study, age, years of education and genetics may be significant predictors for AD and other dementias.

In a similar study, Tang et al. (2001) also report differences in the prevalence of AD among African Americans. Participants were recruited from the Washington Heights-Inwood Community Aging Project (WHICAP), a community based, longitudinal study of dementia among African Americans, Caribbean Americans and whites. Data were collected between 1992 and 1999 and the sample the included 1,788 participants. To ensure equal representation of the groups, the sample was divided into 37 subsamples. The sample was also stratified by age; 65 to 74 and 75 and older. Within the sample, 34.11% were African American, 42.5% were Caribbean Hispanic, and 23.3 were white. Across all groups, the majority of participants were female. Assessments were conducted at 24 month intervals during the seven-year study period and consisted of multiple measures. Participants completed a general health evaluation, a performance

evaluation of activities of daily living, and a cognitive function test as measured using by Care-Diagnostic Interview. In addition, participants also completed neurological and neuropsychological evaluations. Measures for the neuropsychological examination included the tests for orientation, language, general reasoning ability, visuospatial ability, and memory. Results of evaluations from each case was reviewed by a consensus panel of experts comprised of neurologists, psychiatrists, neuropsychiatrists, and diagnosis was determined. Participants diagnosed with dementia were further subclassified based on criteria for probable or possible AD or vascular dementia. The Clinical Dementia Rating Scale was used to measure the severity of AD. Other types of dementia were also diagnosed based on approved criteria. Findings indicate that among African Americans, probable or possible AD occurred more frequently (10.5%) compared to whites (5.4%). The data also suggest that among individuals aged 65 and older, African American had the second highest prevalence rates of AD; Caribbean Hispanics (20.8%), African Americans (18.8%) and whites (7.8%). Furthermore, African Americans aged 75 to 84 and 85 and older, were two times as likely to have AD compared to their white counterparts. In the group aged 64 to 74, the data indicate that African Americans were three time more likely to have AD compared to whites.

In another study, Hendrie et al., (2001) conducted a cross cultural, longitudinal study to compared incidence rates of AD between African Americans in the United States and Yoruba in Nigeria. The Indianapolis-Idaban Dementia Project utilized a multi-wave design; a baseline prevalence study followed by two incidence waves at the two and five year marks. The baseline survey was conducted between 1992 and 1993; the two-year wave was conducted between 1994 and 1995, the five-year wave was conducted between 1997 and 1998. Participants in Idaban were recruited via door to door screening and date of birth was estimated based on cultural norms.

Census track data was used to identify areas in Indianapolis populated by African Americans aged 65 and older and random sampling was used to recruit participants. The study included 4,606 participants; 2459 community-dwelling Yoruba and 2,147 community-dwelling African Americans. At the beginning to each wave, an in-home screening for dementia was conducted using the Community Screening Interview for Dementia (CSID) and participants were assigned to a group (good, intermediate, or poor) based on their scores on neurological and neuropsychological evaluations. All participants from the poor group were clinically assessed. Those in the intermediate and good groups were randomly sampled for clinical assessment. Participants who were clinically assessed completed in home neuropsychological testing as measured by modified version of the Consortium to Establish a Registry for Alzheimer's Disease test battery and a medical examination. An informant interview was also conducted by a research nurse and psychometrician to assess participants' cognitive function and personality functions; participants' performance on activities of daily living, review participants' medical history and medications and review family history of dementia. Information was reviewed by a panel of experts at each site and a site diagnosis was determined. A consensus panel which included experts from both sites, reviewed the site diagnosis and determined a final diagnosis. Incidence rates were calculated based on the person-years method of estimation. Findings indicate that African American had higher incidence rates for dementia and AD compared to Yoruba participants. Specifically, the data indicate that among African Americans, the rate of dementia was 3.24% and the rate for AD was 2.52%. Among the Yoruba participants, the rate of dementia was 1.35% and the rate of AD was 1.15%.

In a recent study, Mayeda et al. (2016) examined disparities in dementia incidence among African Americans, American Indian/Alaska Natives (AIAN), Latinos, Pacific Islanders, Asian

Americans and whites. The study utilized prospective data from the Kaiser Permanente Northern California (KPNC), a health care delivery system in northern California, collected between January 2000 and December 2013. The study included 274,283 participants aged 65 and older and within the sample, 6.8% were African American, 1.6% were AIANs, 7.6% were Latino, .16% were Pacific Islanders, 8.3% were Asian American, and 75.2% were white. The mean age with 73.4 years and the more than half the sample (54.6%) were female. Data were retrieved from electronic medical records and diagnosis of dementia at KPNC was based on factors such as medical history; physical examination, mental status and functional ability, blood tests and neurological imagining. Dementia diagnosis were validated by the International Classification of Disease, Ninth Revision (ICD-9). According to the study, a previous study found that a similar battery of ICD-9 criteria was shown to have 95% specificity and 77% sensitivity compared with a consensus panel diagnosis of dementia in a similar health care delivery system in Seattle, Washington. Findings were consistent with other studies and indicate that among African Americans, the risk of dementia was 40% higher compared to whites. The data also indicate disparities in rates among African American men and women. Specifically, incidence rates for African American women were approximately 60% higher compared to Asian- American women; incidence rates for African American men were 93% higher compared Asian-American men. Furthermore, the data indicate that while dementia rates varied between all groups, the rate of dementia incidence for African Americans was higher compared to all other groups.

Contrary to these findings, Fillenbaum et al (1998) found no racial differences in AD prevalence and incidence in a study of older African Americans and whites. Participants were recruited from the Duke Established Populations for Epidemiologic Studies of the Elderly (EPESE) and the study utilized a multistage probability sample to recruit adults aged 65 and older.

The sample included 4136 community dwelling adults and baseline data were collected between January 1986 and June 1987. Within the sample, 54.6% were African American and 43.8% were whites. At baseline, participants completed a physical functioning assessment, medical history, utilization of health and support services assessment, and depression screening. Cognitive function was also evaluated using the Short Portable Mental Status Questionnaire (SPMSQ). Participants were reassessed three years later and based on established classifications of SPMSQ scores, were selected for either the prevalence study or the incidence study. Participants in the prevalence and incidence studies completed neurological testing as measured by the CERAD Neurologic battery; the Mini Mental Status examination, a Word List Learning and Recall and Recognition assessment and the Constructional Praxis measure. Information was also gathered to assess changes in participants' subjective memory, behavior, and performance of activities of daily living. Data were reviewed by a consensus panel of experts and dementia diagnoses were determined based on established criteria. Findings indicate that there was no difference in the prevalence rate of dementia among African Americans and whites. Findings from the three-year incidence study show a similar result. According to the study, while 28.4% of participants met the criteria for dementia, there was no statistically significant difference between the groups.

Another study by Yaffe et. al (2013) showed that differences in prevalence rates of dementia between African Americans and whites were reduced when SES and lifestyle factors were adjusted for. Participants were recruited from the Health ABC study and 2457 adults aged 65 and older were included in the study. Within the sample, 41.5% were African American, 58.2% were white and the majority of the sample was female. Data were collected over a 12-year time period, ending in January, 2011. Dementia was assessed by review of hospital record indicating a hospital event associated with dementia; a score of 90 or below on the Mini Mental Status

examination, history of prescribed dementia drugs, and race stratified changes in the Mini Mental Status examination. The Mini Mental Status examination was repeated five times during the study; at years 3,5,8,10, and 11. Health status was measured by self-reports on diabetes, hypertension, stroke, and heart attacks. Depression was assessed using the Center for Epidemiological Studies depression scale. Lifestyle factors included measures of drinks per day, cigarette smoking and self-reported physical activity. Body mass index was also calculated for all participants. Findings indicate that during the 12 year follow up, rates of dementia for African Americans were higher compared to whites. However, when differences in SES were considered, differences in rates of incidence between the groups were no longer significant.

Cognitive Health and Fundamental Causes

The Theory of Fundamental Causes (Link and Phelan, 2995) proposes a link between social conditions and health outcomes. Specifically, the theory asserts that the focus on proximate risks to health have a negligible effect on reducing health disparities. Thus, distal causes, such as economic inequality, are more closely linked to the prevalence and incidence of preventable diseases. According to the theory, individuals with higher SES have better health outcomes because they have greater access to resources which serve to safeguard them against health risks. Resources such as money; social networks, power, prestige and access to social support networks serve to advantage high SES individuals and is directly correlated with reduced risk factors for disease. Resources function both individually and contextually, producing social frameworks which advantage high SES individuals. Consequently, disparities persist because the mechanisms that link SES and health outcomes change over time, and due to greater access to resources, high SES individuals have increased opportunity to learn how to protect themselves as health

innovation emerge. Studies by Link Phelan et al. (2004); Luftey and Freese (2005), and Polonijo et al. (2013) support the Fundamental Causes Theory.

As a test of the Fundamental Causes Theory, Link and Phelan (2004) explored the association between SES and mortality. Specially, the study examined the effects of SES on mortality rates and hypothesized that for less preventable diseases, SES is less strongly associated. In other words, mortality rates for more preventable diseases are lower compared to rates for less preventable disease. This suggests that high SES individuals access resources, such as new knowledge about disease prevention and treatment, to mediate the risk of mortality. According to the study, low SES has been shown to be associated with risk factors linked to potentially fatal disease such as smoking, obesity, stress, and malnutrition. Furthermore, the relationship between low SES and mortality is supported by studies on chronic disease, preventable disease, and injures. In addition, the study indicated that low SES and mortality are linked to the 14 major causes of death listed in the International Classification of Diseases (Illsley and Mullen, 1995). Data were collected from the National Longitudinal Mortality Study, which included of a subset of Current Population Surveys conducted between 1979 and 1981. SES was measured by family income and educational attainment. Separate categories were created for these variables (less than $10,000, $10,000-$24,999, and $25,000 or more of income; 0 to 11 years, 12 to 15 years, and 16 years or more of education). Information on cause of death was obtained from the National Longitudinal Mortality Study and an expert panel established and validated ratings on death preventability. Findings were consistent with the Fundamental Causes Theory and indicated that across all racial and ethnic groups, mortality rates for causes of death that are more preventable were significantly related to SES compared to rates for less preventable diseases.

Luftey and Freese (2005) examined the impact of SES on diabetes treatment and management. According to the study, diabetes is a leading cause of mortality in the United States and its prevalence increased 33% from 1990 to 2003 (CDC, 2004). Furthermore, diabetes is a chronic condition that requires significant patient manage and access to routine quality health care and prior research shows a link between SES and rates of incidence of diabetes. Thus, the purpose of the study was to shed light on the complex nature the mechanisms involved in the treatment and management of diabetes and how SES serves to mediate these mechanisms. Ethnographic data were collected during 1997 to 1998 from two separate clinic sites with distinct populations; one white, upper and middle class (Park Clinic) and one minority, working-class, underinsured (County Clinic). Patient age and distribution of diabetes classification was similar in both clinics. Multiple data collection strategies were utilized and included 250 hours of direct observation of consultations between patients and practitioners; 20 hours of videotaped consultations, 25 qualitative interviews with clinic physicians and staff, and telephone surveys with 170 diabetes patients from both clinics. The data were organized into four mechanism domains: manifested differences between the two clinics; differences that manifested as external constraints on treatment routine, differences in patient motivation, and differences in patient cognitive abilities. Findings indicated significant differences between the clinic sites. Firstly, there were differences in care management and continuity. Patients at Park Clinic were seen by the same physician at each visit whereas physicians, primarily residents, at County Clinic rotated patients. At Park Clinic, increased continuity resulted in better doctor-patient relationships and allowed practitioners to become familiar with their patients. Consequently, patients at Park Clinic received more timely diagnosis and more accurate treatment plans. By contrast, low continuity prevented practitioners at County Clinic from learning about their patients and developing relationships

which can inform assessment of treatment options. A second finding was that Park Clinic offered better resources for on -site diabetes education. If additional diabetes management education was recommended, patients at Park Clinic were immediately referred to an on sight education center, staffed by professionals with educational materials readily available. County Clinic, on the other hand, had a volunteer diabetes educator who did not have a designated office space or educational materials. Thirdly, residents at County Clinic played a larger role in directing patient interaction and care compared to Park Clinic. Residents at County Clinic rotated frequently and provided the majority of direct patient care. As a result, patient continuity was low and the opportunities to develop relationships and gather relevant patient information was challenging. In addition to these differences, findings also suggested that lower SES patients have further constraints such as the costs associated with of diabetes treatment and management; work environments which may not be compatible with adhering to a treatment plan, and lack of access to social support networks which encourage and promote adherence and compliance with treatment plans.

In another test of the Fundamental Causes Theory, Polonijo et al. (2013) examined the processes by which mechanisms are produced and how they function to perpetuate health disparities. According to the study, the HVP vaccine is a new treatment aimed at preventing cervical and other cancers, which tend to manifest in mid to late adulthood. Prior research indicates that although cervical cancer deaths have been reduced by 70% (Casper and Clarke, 1998; Downs, Scarinci, Einstein, & Flowers, 2010; Reiter et al., 2009); low SES women are still more likely to be diagnosed at later, less treatable stages (Garnes, 2008). To test the Fundamental Causes Theory, the study examined whether low SES individuals had less access to the HVP vaccine and its potential long term benefits, compared to high SES individuals. Specifically, the study explored three stages of the innovation which included: parental/guardian knowledge about

the HVP vaccine; recommendation from health professional to receive the HVP vaccine and, adherence and compliance with HVP injection regimen. Data were collected from the National Immunization Survey – Teen (NIS- Teen, 2008, 2009, and 2010), a nationally representative sample which identifies groups at risk of vaccine preventable diseases (CDC, 2010). Participants within the NIS-Teem were recruited via repeated a random-digit dialing phone survey followed by a mailed survey. The sample consisted of 41,358 adolescent girls (13,055 in 2008; 14,764 in 2009, and 13,539 in 2010) aged 13-17 and their parents or guardian. Racial categories included African American, Hispanic and White. SES was measured by the mother's level of education and household income and the all analyses controlled for age of the adolescent. Findings indicated significant disparities in knowledge about the HVP vaccine, and consistent with the Fundamental Causes Theory, higher SES White parents were more likely to have knowledge about the HVP vaccine compared to lower SES minority parents. Similarly, low SES minority parents were less likely to receive a recommendation from a health professional for the HVP vaccine compared to higher SES Whites. Furthermore, lower SES adolescents were less likely to adhere and comply with the HVP injection regimen due to parent or guardian's lack of insurance and other constraints which negatively impact on their ability to comply with the required time frame for the injections.

According to the Fundamental Causes Theory, SES is linked to health outcomes. Specifically, individuals who have access to health promoting resources are better equipped to prevent and respond to health risks compared to those with few or no resources. The theory can be applied to studies of CI and dementia. Previous studies suggest that the risk of CI and dementia, AD in particular is higher among African Americans. Research also suggests that African Americans are more susceptible to preventable diseases, such as hypertension and diabetes, associated the risks for CI and dementia. Furthermore, the Administration for Community Report

(ACS, 2015) indicates that in 2013, the poverty rate for African American aged 65 and older was 18.7%, compared to 10.2% for other older Americans. The report also indicates that despite increases in educational attainment among African Americans, significant gaps persist. In 2014, 74% of African Americans aged 65 and older were high school graduates and 17% had earned a bachelor's degree or higher. By contrast, 84% of all other adults aged 65 and older were high school graduates and 26% had a bachelor's degree or higher. Previously reviewed studies by Manly et al (2002, 2003); Mehta (2004), Barnes et al. (2011), and Zhang et al. (2016) suggests that education level is a possible mechanism by which SES is linked to disparities in rates of CI and dementia among African Americans and thus using the Fundamental Causes Theory is an appropriate framework for the current study.

Background on the KAP Model

According to the World Health Organization (WHO), KAP studies are highly focused evaluations that provide a baseline to measure changes in human knowledge, attitudes and practices in response to a specific intervention, usually outreach, demonstration or education (World Health Organization, 2003). Furthermore, the WHO suggests that KAP studies represent a useful strategy for gathering information, particularly on health behaviors that have not been studied extensively. To this end, KAP studies help to identify gaps in knowledge; patterns of behavior, and identify potential barriers to the effective design and implementation of culturally sensitive intervention strategies. In addition, KAP studies shed light on how attitudes may influence behaviors.

Beginning in the 1950s, KAP surveys were primarily utilized in global family planning and population studies. These studies were designed to measure whether the concept of family planning existed among different populations, and to provide insight on the knowledge, attitudes

and practices to promote interventions on a global scale (Cleland 1973, Ratcliffe 1976). During the 1960s and 1970s, KAP surveys were instrumental in understanding family planning in Africa (Schopper et al.1993). As international aid organizations including the WHO identified community perspectives and human behavior as critical to improving health outcomes, KAP surveys have become an integral methodology used to explore health behavior and practices. Contemporarily, KAP surveys are used to understand diseases such as malaria, TB, HIV/AIDS, and sexual reproductive health in developing countries. Following is a brief summary of literature illustrating the effectiveness of KAP surveys in understanding what people know, how they feel, and how they behave in relationship to diseases.

International KAP Studies

KAP in Africa

A study by Ali-Risasi et al. (2014) assessed trends in cervical cancer in the Republic Congo. According to the study, cervical cancer is the most relevant in the region yet little is known about what information women have about cervical cancer. Using a cross section design, a twenty item questionnaire was administered to assess level of factual knowledge about cervical cancer; attitudes about cervical cancer, and practices associated with preventing cervical cancer. The sample included 524 women aged 16-78 years old. Findings from the study revealed a low level of knowledge, attitudes, and practices about cervical cancer which contributed to high mortality among women in this region of the Congo.

In another study, Shaaban et al. assessed knowledge of nutritional behaviors among preschool teachers in Egypt. Based on a longitudinal design, preliminary and post assessments were administered to determine changes in factual knowledge about healthy nutrition; attitudes about nutrition, and practices associated with healthy nutritional habits. The study utilized a

fifteen item questionnaire and the sample included 150 participants; 149 females, 1 male. Following the preliminary assessment, participants completed three nutritional workshops and post interventions assessments were conducted three months later. Findings from the study indicate that knowledge and positive attitudes about good nutrition were significant factors in improving teacher modeling of nutritional behavior for preschool children.

A third study, Nata et al. (2008) assessed HIV/AIDS behaviors among college students in Malawi. Utilizing a cross section design, the study included a fifteen item questionnaire to gather baseline data which assessed knowledge about where to obtain HIV testing on campus; HIV transmission and where to obtain condoms; attitudes and perceptions about vaginal and anal sex, and practices associated with reducing risks associated with the transmission of HIV. The data were collected to inform the design and implementation of future interventions. The sample included 314 participants; 199 males and 115 females. Findings suggested that knowledge measures were high and that there were no significant differences in HIV/AIDS related knowledge between males and females. Findings also indicated that a higher proportion of males reported knowing how to use condoms compared to females and that a higher proportion of females reported knowing someone with HIV compared to males. These results suggest that knowledge about HIV may influence attitudes about HIV, and may also be linked to engagement in practices associated with reducing the risk factors for HIV transmission.

Lastly, Sizya et al. (2008) study assessed smoking among youth in Somaliland. According to data from the 2004 Global Youth Tobacco Survey (GYTS), the prevalence of tobacco use is highest among teenagers 13 to 15 year olds in the region. To estimate the prevalence of smoking in Somaliland, the study analyzed data from the Somaliland GYTS (2004) to gather baseline data on factual knowledge about the risks associated with smoking; attitudes about smoking, and

practices associated with smoking cessation. Given the prevalence rate of smoking among adolescents in the region, the data were collected to inform the design and implementation of future interventions. The sample included 1122 participants aged 13 to 15 and the majority of were males (63%). Findings suggest that knowledge about factors that contribute to the harmful effects of smoking, and anti-smoking message may be effective interventions for reducing the prevalence of smoking among youth in Somaliland.

KAP in China

Sun et al. (2014) study assessed food safety education in among college student in North China. The study utilized a 36 item questionnaire and assessed factual knowledge about food safety; attitudes about food safety and practices associated with food safety. The sample included 1300 participants (17 to 39 years old). Findings suggest that while students have knowledge about food safety, and expressed the importance of food safety, they lack agency in exercising their rights to advocate for healthy food options.

In a different study, Zhang et al. (2012) assessed fall induced injuries among the elderly in Shanghai, China. The study utilized a 31 item questionnaire which assessed knowledge about fall prevention, attitudes about falls, and practices associated with reducing the prevalence rates of falls. The sample included 5,910 participants (60 years and older); pre intervention (2889), post intervention (3021) from five neighborhood areas in the region. Findings suggest that although the KAP interventions were initially successful in reducing falls among the elderly in Shanghai, changes in knowledge about falls and fall prevention were not sustained. This suggests that future interventions should also include knowledge which promotes long term awareness and adaptation to safer practice.

KAP in the Middle East

Sadeghi et al. (2014) study assessed patients with Pemphigus vulgaris (PV) in Iran to better understand the relationship between self-care behaviors upon diagnosis and reducing risk of exposure and reoccurrence. According to the study, PV is the most prevalent of Pemphigus variants in Iran and women are at greater risk. Using a quasi- experimental design, the study evaluated an intervention designed to reduce PV risks. A 56 item questionnaire was administered to assess factual knowledge about PV; attitudes about PV, and practices associated with reducing risk factors for PV. The sample included 88 participants; 44 in the intervention group and 44 in the control group. Participants completed a preliminary assessment prior to the intervention and following a two education program, completed the post assessment. Findings from the study indicate that knowledge and attitudes increased self-care behaviors which in turn improved the overall treatment process for patients with PV.

In another study, Huijer et al. (2013) assessed trends in palliative in Lebanon. A 2007 study which included 15 hospitals; 3757 nurses and doctors suggests the need for increased awareness of factual knowledge about palliative care; attitudes about palliative care, and greater access to resources and services which will improve the quality of palliative care in the region. Findings indicate that KAP surveys were instrumental in identifying gaps in knowledge about palliative care, understanding beliefs about palliative care and developing culturally relevant practices which inform continued research on palliative care.

KAP in South Asia

Vaidya et al. (2013) assessed trends in cardiovascular health in Nepal. According to the WHO, abject poverty is a leading cause of non-communicable diseases (NCD) in low-income and middle income countries such as Nepal. Given the link between NCD and cardiovascular health, the study utilized a 35 item WHO questionnaire to assess factual knowledge about cardiovascular

disease (CVD), attitudes about CVD, and practices associated with improving outcomes and reducing risk factors for CVD. The sample included 777 participants aged 25 to 59, from two villages in Northern Nepal. Findings from the study revealed low factual knowledge about cardiovascular health; less positive attitudes about maintaining cardiovascular health, and low engagement in practices promoting cardiovascular health, especially among those already affected by the disease. The authors suggest that future intervention strategies need to take into account the impact of abject poverty and other social determinants of health when considering how to improve cardiovascular health outcomes within this region.

Findings from the literature suggest that studies using the KAP model play a vital role in understanding health beliefs and practices. Specifically, these studies demonstrate the significance of identifying knowledge gaps, beliefs, and behavioral patterns which influence health outcomes. Although the focus differs among the studies, findings suggest that access to knowledge has a positive impact on attitudes related to health maintenance. This, in turn, will most likely result in improved practices pertaining to health behaviors. Studies by Sadeghi et al. (2014); Shaaban et al. (2012); Sizya et al. (2008); and Sun et al. (2014) show that access to knowledge was related to more positive attitudes and resulted in practices which promoted positive health behaviors. Conversely, studies by Ali-Risasi et al. (2014) and Vaidya et al. (2013) suggest that low access to knowledge results in poor attitudes and behaviors which contributes to poor health outcomes.

KAP Studies in the United States

The present study seeks to explore the relationship between SES and KAP on cognitive health among African Americans. Although there is a paucity of literature that on KAP, SES and cognitive decline, there is literature that demonstrates the impact of SES on KAP for other health related outcomes. Following is a brief summary of the role of SES on KAP.

KAP, SES and Cancer Studies

Breen et al.'s (1994) study assessed trends in mammography screening in the United States from 1987 to 1990. According to the study, age, race, income and education were primary predictors of access to mammography screening. Data were collected the National Health Interview Survey (NHIS) cancer control supplement (1987) and the disease prevention supplement (1990) which assessed knowledge, attitudes and practices about breast cancer screening methods. Data from this survey was used to compare trends in breast cancer screening between African Americans, Hispanics, and Whites. The sample included 19,579 participants; 6771 (1987) and 12, 808 (1990) aged 40 and older. Findings indicate that knowledge about breast cancer screening increased and as a result, the rate of screening doubled; from 17% in 1987 to 33% in 1990. Despite this increase, the results indicate continued dipartites in rates for screening between the groups. According to the study, white women with high SES, education, access to insurance and routine medical care tended to have greater access to mammography screening compared to the other groups. Findings also indicate that despite increased knowledge about breast cancer screening, costs associated with mammography screening and lack of physician recommendation are barriers among low SES African American and Hispanic women.

In a different study, Tsark et al. (2001) assessed changes in knowledge, attitudes and practices pertaining to breast health in Native Hawaiian women between 1990-2000. Data collected from the Special Populations Committee of the American Cancer Society KAP survey (1989-1990) was instrumental in reducing breast cancer mortality rates and increasing survival among Native Hawaiian women. The study utilized a 30 item questionnaire and assessed factual knowledge about breast cancer; attitudes about breast health, and practices associated with

maintaining breast health. The sample included 303 participants. Similar to the previous study, knowledge about breast health resulted in better breast health practices, however disparities continue to persist. Consistent with the previous study poverty is a barrier to mammography utilization and findings suggest that women without health insurance are less likely to get a mammogram even if the screening is free due to fear of costs for potential treatment.

In a third study, Paskett et al. (2004) assessed breast cancer screening among African American, Native American and White women. The American Cancer Society reports that low SES women have lower incidence of breast cancer compared to women with higher SES, but due to late stage diagnosis, they have higher mortality. The study examined racial differences in access to clinical breast exams (CBE) and mammography screenings. The study utilized a 25 item questionnaire and the sample included 892 participants (33% African American, 41% Native American, 25% white). Key findings indicate that among African American and Native American women, lack of knowledge, lower SES, lack of insurance, and lack of regular health care are significant barriers to mammography screening compared to white women.

Lastly, Steele et al. (2000) study assessed trends in prostate cancer screening among older men. Using data from the New York Behavioral Risk Factor Surveillance System (BRFSS, 1995) and the African American Men Survey (AAMS, 1995), the study examined prostate-cancer knowledge, attitudes and prostate screening practices among men 50 years and older. The study utilized two 30 item questionnaires and the sample included 1373 participants (631 from the BRFSS and 742 from the AAMS). Findings from both surveys indicate that men with more knowledge about the risks of prostate cancer were more likely to have a digital rectal exams (DRE) and prostate specific antigen (PSA) screening compared to men with less knowledge. Furthermore, the results also indicated a link between socioeconomic status of the men and

prostate cancer screening. Specifically, men with more education, earning $25,000 or more per year were more likely to have a DRE or PSA compared to men who earned less than $25,000 per year. Analysis from the AAMS indicate that race, lack of knowledge, and lack of physician recommendation for PSA test and DRE screening decreased the likelihood of receiving a prostate screening exam.

KAP, SES and Cigarette Smoking

Chislom et al's. (2010) study assessed cigarette smoking among patients and staff at perinatal substance abuse center. To identify differences in awareness among patients and staff about the health risks of smoking during pregnancy, the study utilized two separate KAP questionnaires; one for staff and one for patients. They measured inter group differences in knowledge about the risks of smoking during pregnancy, attitudes about smoking during pregnancy, and practices associated with smoking cessation. The patient-KAP included 64 items and the staff-KAP included 96 items. The sample included 136 participants; 95 patients and 41 employees. Key findings indicate patients and staff were similar in knowledge about risk factors for smoking cigarettes during pregnancy. Despite knowledge about the risk factors, low SES patients continued to smoke. One possible explanation is that lower SES is associated with lower reading levels, lack of knowledge about risk factors, and non-compliance with medical advice. Given that patients and staff were similar in knowledge about risk factors for smoking cigarettes during pregnancy, this suggest knowledge may not be a significant factor contributing to smoking among low SES patients.

KAP, SES and Hepatitis A

Bardenheier et al.'s (2010) study examined trends in hepatitis A vaccinations among children in rural California. According to the CDC, hepatitis A is preventable and that vaccination,

especially among young children, is the most effective means of reducing risk of infection. The study utilized a 15 item questionnaire to assess factual knowledge about hepatitis A; attitudes about vaccinations and practices associated with reducing risk factors for hepatitis A among parents of children aged 4 to 5 years old in 2000. The sample was racially and ethnically diverse and included 648 participants. Findings indicate that despite efforts to increase knowledge about the benefits of the hepatitis A vaccinations, rates of vaccinations did not increase. According to the study, possible explanations for under immunization are lack of parental awareness about the vaccine and the perception that hepatitis A is not a potential threat to their child's health. Although the study did specifically target low SES children, findings indicate that children with mothers with less than 12 years of education and annual income of less than $50,000 were likely to receive hepatitis A vaccinations compared to those from families with higher education and income. Perceptions of greater risk of infection among lower SES children and provider participation in vaccination programs for low income children are possible explanations for this finding.

KAP, SES and Mosquito Infestation

Dowling et al. (2013) assessed factors which reduce mosquito infestation in an urban environment. According to the study, mosquito-borne diseases present a public health risk to urban areas. The study utilized a 15 item questionnaire and the sample included five neighborhoods (240 households) in Washington, DC. Findings indicate a link between SES, knowledge about mosquitos, and reduction practices. Specifically, the findings indicate that while respondents from higher SES households had more mosquito related knowledge compared to respondents from lower SES households, they lacked motivation to control mosquito infestations compared to low SES households.

Although most of the literature presented focused on international health issues, the studies based in the United States demonstrates the impact of SES on KAP. The findings suggest that SES impacts knowledge and attitudes about health behavior and thus, is a risk factor for poor health outcomes. Lower SES individuals are more likely to suffer disease compared to high SES individuals. Furthermore, these studies show that the KAP model is a relevant methodological strategy for investigating what African Americans know about cognitive health, what attitudes African Americans have about cognitive decline, and what practices African Americans associate with maintaining cognitive. Previous studies also suggest the role of SES in knowledge, attitudes, and practices. Specifically, these studies support the role of SES in perpetuating health disparities across various health conditions. In summary, SES impacts KAP and is a predictor of health outcomes such that higher SES individuals have greater access to health promoting resources which serve as a protective factor against diseases, compared to lower SES individuals.

KAP predicting subjective cognitive health among African Americans

What is known about how African Americans perceive cognitive health has been inferred from focus group data collected between 2005 and 2007 by the Centers for Disease Prevention and the Alzheimer's Association. During this period, 55 focus groups were conducted in nine states to better understand how perceptions of cognitive health difference among diverse groups. Findings from the 2007 report titled *Healthy Brain Initiative (HBI): A national road map to maintaining cognitive health*, indicate that among the sample of African Americans, factors perceived as contributing to cognitive health include regular physical activity, healthy diet and nutrition habits, community engagement, brain maintenance, and spirituality. Findings also indicate that while African Americans are aware of the importance of physical activity and healthy

diet and nutrition habits in preserving cognitive health, there is confusion about specific modes and duration of exercise, and the exact meaning of what foods constitute a healthy diet.

In 2008, the HBI commenced its first community level interventions targeting older African Americans in Atlanta, Georgia and Los Angeles, California. Both interventions were implemented in April 2008 and the implementation time frame was between five to seven months for each intervention. Based on findings from the focus groups, the primary goals of the interventions were to: (1) increase knowledge and awareness of cognitive health among older African Americans by developing partnerships in the community (2) promote engagement in practices that promote cognitive health by conducting discussion groups about cognitive health and the link between risk factors and protective factors (3) sponsor community wide events focused on educating community members about the link between risk factors and protective factors for AD (4) create and disseminate culturally relevant media messaging to educate community members about link between risk factors and protective factors for AD. Fuller et al.'s (2012) evaluation of both the HBI interventions suggest that the primary goals were met. Specifically, their findings indicate that through developing community partnerships, sponsoring community discussion groups and disseminating culturally relevant mass media, awareness of knowledge about cognitive health and practices associated with maintaining cognitive health, such a healthy eating habits and physical activity, was increased. Although the interventions were successful, a key recommendation for future interventions emphasized the importance of gaining insight on knowledge, attitudes, and practices from the target audience in order to ensure that interventions are tailored to meet their particular need.

Research on knowledge about cognitive health, attitudes about cognitive decline, and practices associated with promoting and maintaining cognitive health is very rare, especially

among the older African American population. To this end, the KAP Model is an appropriate methodological strategy for predicting subjective cognitive health among older African Americans.

Knowledge about cognitive health

There is limited research on what older African Americans know about cognitive health. Moreover, current research about cognitive health is focused on dementia, AD in particular. In existing studies, knowledge about AD is measured through four key domains: (1) factual knowledge; (2) knowledge about risk factors, (3) knowledge about protective factors, and (4) knowledge about potential treatments. Findings from Connell et al. (2007) indicate that for the statement "Alzheimer's disease is the term for normal memory loss," African Americans were significantly less likely to answer correctly compared to whites. Robert et al.'s. (2003) study on the difference in perceptions between African Americans and whites indicated that African Americans were less likely to correctly identify knowledge items about AD facts compared to whites. Ferguson et al. (2003) found that African Americans were more likely to identify the importance of diet and physical exercise as protective factors for AD and stress as a primary risk factor for AD. Ayalon and Arean (2004) found that compared to whites, African Americans were more likely to view AD as a form of insanity and to also view forgetfulness as a symptom of AD. In addition, the study found that compared to whites, African Americans had lower mean scores on knowledge questions pertaining to AD. Similarly, Park et al. (2012) found that in addition to race, disparities in education levels contribute to disparities in scores on knowledge based questionnaires among African Americans and whites.

Attitudes about cognitive health and cognitive decline

Of the available research relevant to African Americans, most focuses on attitudes about AD symptoms. Current research suggests that among African Americans, attitudes about cognitive decline are deeply associated with culture. According to Goodenough "culture consists of the criteria or guidelines for speaking, doing, interpreting, and evaluating that people who live and work together have acquired in the course of interacting with one another in the conduct of recurring activities and that they have thus learned to attribute to one another" (Goodenough, 1999, p. 85). From the limited information available on Alzheimer's disease and African American cultural perceptions, some common themes emerge. Of the studies that examined the ways in which culture influences attitudes about cognitive decline, findings suggest that for African Americans, the symptoms of Alzheimer's disease are often associated with normal aging (Valle, 1990), mental illness (Cox, 1996), or physical declines (Gaines, 1989).

Gaines indicates that for African Americans, "*worration*", "*falling out*" or "*high blood*" are meanings often associated with the symptoms of Alzheimer's disease. Gaines suggests that these expressions describe the worry and stress of cultural oppression and discrimination experienced by African Americans as a result of slavery. Furthermore, Gaines suggests that although worrying is believed to damage the brain, "worration" is not viewed as a disease or illness (Gaines, 1989, p. 35).

Dilworth-Anderson and Gibson (1999; 2002) support Gaines' assertions and conclude that for African Americans, perceptions of AD and responses to cognitive decline are based on cultural themes of survival. Essentially, Dilsworth-Anderson and Gibson suggest that because of the historical oppression that African Americans have experienced, such as slavery, segregation, and institutional racism, AD may be associated with normal aging. Also known as "double jeopardy"

which asserts that being poor and minority results in disadvantages which negatively affect health outcomes (Clark & Maddox; 1992; Ferraro & Farmer, 1986). Consequently, African American tend to view AD as less of a threat compared to whites. Furthermore, caregivers may be predisposed to coping with the challenges of providing care to an elder with AD are therefore less likely to seek assistance from formal agencies.

Roberts et al. (2002) study assessed differences in perceptions of AD between African Americans and White. The survey instrument included 82 questions regarding knowledge, attitudes and beliefs regarding AD. and health care options and consisted of four domains: (1) illness beliefs; (2) factual knowledge about AD, (3) sources of information and (4) perceived threat for AD. The sample consisted of 452 participants; 39% African and 61% Whites. Findings suggest that significant experience adapting to adversity may contribute to how African Americans perceive and respond to AD. Moreover, the study suggests that compared Whites, African Americans are more likely to view memory loss as a normal process of aging. Furthermore, African Americans perceive Alzheimer's disease as less of a threat and were less concerns about developing the disease. Like Dilworth-Anderson and Gibson, Roberts et al. also asserts that significant experience adapting to adversity may contribute to how African Americans perceive and respond to Alzheimer's disease.

Contrary to previous research, Fox et al. (1999) suggest that a cultural focus is narrow and argue that, to fully understand cultural beliefs about AD more attention needs to be given to structural inequalities within society such as institutional racism. In a pilot study conducted to assess differences in responses to AD among African Americans and Whites, Fox et al. conducted twelve qualitative interviews with caregivers of older African Americans with AD. There findings suggest that for African Americans, sociohistorical factors such as institutional racism and

discrimination significantly impact perceptions and meanings of AD. Furthermore, they suggest that future research should address the structural inequalities inherent in institutional racism and the resulting barriers to knowledge and services which serve to exacerbate the prevalence of AD within the African American community.

Practices associated with maintaining cognitive health

Research suggests that engaging in health behavior is an important protective factor for cognitive impairment and dementia. According to the literature, diet and nutrition; physical activity, and sleep are essential to promoting cognitive health and maintaining cognitive function. Within the existing literature, few studies focus specifically on older African Americans and their uptake of health promoting behaviors.

Diet and Nutrition

Research on the association between diet and nutrition and cognitive health is evolving and some population-based epidemiological suggested a link. While there have been even fewer clinical trials, some studies suggest that dietary habits which reduce risk factors for conditions associated with cognitive impairment such as diabetes and hypertension, are also associated with reducing risk for dementia. While there are not specific scientific recommendations for foods or diets to prevent cognitive impairment, the research suggests mixed results regarding the association between diet and nutrition and cognitive health.

Luchsinger et al. (2007) conducted an analysis of clinical reports suggesting a link between diet and cognitive health. According to the review, findings suggest that diets that are rich in antioxidants; vitamins B6, B12, folate and fish may be related to maintaining cognitive health. In the same review however, there is also evidence that the intake of certain nutrients has not been

proven to reduced risk for cognitive decline. Thus, the current data does not allow for a consensus on generalizable findings.

Of the few studies that included African American, Morris, et al. (2004) assessed the relationship between type of fat consumption and cognitive changes associated with age. Participants were recruited from Chicago Health and Aging Project (CHAP) and the study included 2560 participants aged 65 and older. Within the sample, 81% African American and 75% Whites. Participants completed three measures of cognitive assessments at baseline and 3-year and 6 year follow ups. Cognitive measures included the Mini Mental State Examination, the Symbols Digit Modality Test and the East Boston Test of Immediate and Delayed Recall. Diet was assessed utilizing a self-administered, modified version of the Harvard Food Frequency Questionnaire (FFQ). The FFQ questionnaire included intake of 139 foods and vitamin supplements consumed during the last year. Findings indicated that diets high in polyunsaturated fats and fatty fish may be associated with increasing the risk for cognitive decline and AD.

Additionally, studies also show that nutrients like vitamin E, niacin and folate also have protective effects. In a longitudinal study of nutrition and aging, LaRue et al. (1997) examined the association between vitamin intake and cognitive performance. Participants were recruited from the New Mexico Aging Process and the sample included 137 community dwelling adults aged 66 to 90 years old. The majority of the sample was White and approximately 3% were Hispanic. Participants completed baseline physical examination; nutritional assessments and cognitive performance tests. Nutrition was assessed using diet records and biomedical measures to include blood test. Cognitive function was evaluated using the Abstraction Scale from the Shipley-Harvard Intelligence Test; the Logical Memory and Visual Reproduction Subtest from the Weschler Memory Scale (WMS), and the Rey-Osterrieth Complex Figure Test. Findings

indicate that within the sample, there was an association between vitamin consumption and better performance on cognitive tests.

However, some studies report inconsistent results. Laurin et al.'s., (2004) study examined the association between antioxidant intake and the reduced risk of late life dementia. Participants were recruited from the Honolulu-Asia Aging Study (HAAS), a longitudinal, prospective community-based study of Japanese American men. The sample consisted of 2,459 men aged 71 to 93 years of age. Participants completed cognitive performance tests at baseline (1991-1993) and follow-up testing was conducted twice; 1994-1996 and 1997-1999. Cognitive function was evaluated utilizing the 100 point Cognitive Abilities Screening Instrument; neuropathological testing and an informant interview to gather information on changes in behavior and cognitive function. Participants also completed a physical examination. Diet was evaluated utilizing a 24-hour diet recall measure and participants were asked questions about their daily nutritional intake. Over the study period, 2459 participants maintained cognitive function and 235 developed dementia. Findings indicate that within the sample, there was no difference between the intake of vitamins E and C and beta carotene and the risk of AD.

Dai et al., (2006) found mixed results. According to the study, antioxidants may serve as a protective factor against AD. Prior research supports the link and suggests that fruits and vegetables contain higher concentrations of polyphenols. The study assessed whether the intake of fruit and vegetable juices, which are high in the antioxidant polyphenol, reduces the risk of AD. Participants were recruited from the Kame Project, a population based, prospective study of Japanese-American men in Seattle, Washington. The sample included 1836 men aged 65 and older. Participants completed baseline assessments (1992-1994) and subsequent assessments were administered in four follow-up waves, each wave was two years apart, concluding in 2001.

Cognitive function was measured using the Cognitive Abilities Screening Instrument (CASI) and participants also completed a neuropsychological evaluation, physical examination, and the Dementia Rating Scale. Dietary intake was measured using a self-administered food frequency questionnaire developed specifically for the study population. The food questionnaire assessed daily intake of food, wine, tea, fruit, and vegetable juices. Findings suggest that frequent consumption of fruit and vegetable juices was significantly associated with the reduced risk of AD. However, similar to findings in the HAAS study, the intake of vitamins E, C and beta carotene were not associated with reducing AD risks.

Of the few studies that included a significant proportion of African Americans, Morris, et al. (2004) assessed the relationship between type of fat consumption and cognitive changes associated with age. Participants were recruited from CHAP and the study included 2560 participants aged 65 and older. Within the sample, 81% were African American and 75% were Whites. Participants completed three measures of cognitive assessments at baseline and 3-year and 6 year follow ups. Cognitive measures included the Mini Mental State Examination, the Symbols Digit Modality Test and the East Boston Test of Immediate and Delayed Recall. Diet was assessed utilizing a self-administered, modified version of the Harvard Food Frequency Questionnaire (FFQ). The FFQ questionnaire included intake of 139 foods and vitamin supplements consumed during the last year. Findings indicated that diets high in polyunsaturated fats and fatty fish may be associated with increasing the risk for cognitive decline and AD. (Morris, Evans, Bienias, Tangney, & Wilson, 2004).

In a different study that included African Americans, Wilcox et al. (2009) assessed perceptions about nutrition and brain health among a sample of ethnically diverse older adults. Forty-two focus groups were conducted between November 2005 and August 2007 and ten

targeted older African Americans. The sample included 396 older adults and within the sample, 24% were African American. Data were collected using a nine item focus group guide and participants were asked to share their beliefs and attitudes about brain health and health behaviors associated with maintaining brain health. Finding suggests that African Americans are aware of the benefits of healthy eating behaviors and the link to promoting cognitive health. According to the data, African Americans associate healthy eating behaviors with food type and preparation. Specifically, African Americans expressed concern about healthy food preparation practices and maintaining diets rich in fish, fruits, and vegetables.

Physical Activity

Research has also examined the link between regular physical activity and cognitive health. According to the Alzheimer's Association (2007) regular physical activity is associated with maintaining healthy cognitive function (p. 5). Furthermore, findings from focus group data that was included in *The Health Brain Initiative* (CDC, Alzheimer's Association, 2007) indicate that overall, older adults think that routine physical exercise is important to reducing the risk of cognitive impairment. The report indicates that older adults across racial and ethnic groups think that physical activity, especially walking, helps to support cognitive function. Other activities mentioned included Tai Chi, gardening, and housekeeping (p. 2). While there are mixed results on the most beneficial mode(s) of physical activity and the specific aspects of cognitive function that routine physical preserves, there is consensus that regular physical activity, compared to no activity, serves as a protective factors and is associated with reduced risks for AD and dementia.

Laurin et al. (2001) examined the relationship between physical activity and dementia. Specifically, the study explored the health benefits of physical exercise as a protective factor for dementia, AD in particular. Participants were recruited from the Canadian Study of Health and

Aging (CSHA), a population-based prospective study which focuses on the incidence, prevalence, and risk factors for AD among older Canadians. The sample included 4615 adults aged 65 and older. Baseline assessments were conducted in 1991-1992 and participants were evaluated on their perceived health status; medical history, and functional abilities on ADLs and IADLs. Dementia was evaluated using the modified Mini Mental State Examination and participants also completed neuropsychological testing. Following consensus diagnosis by an expert panel, participants with dementia were excluded from the study. Exercise was measured using an adapted measure of questions from a risk factor questionnaire which assessed frequency and intensity of exercise for participants who reported regular physical activity. A composite index or physical activity was created and participants were rated low; moderate, or high. Follow-up assessments were administered in 1996-1997 and participants were reassessed using the same measures from wave one. Findings indicated a positive relationship between physical activity (low, moderate, or high) and lower risk for cognitive impairment. Furthermore, findings suggest that intense physical activity may reduce the risk of cognitive decline.

In another study Larson et al. (2006) also found a link between physical activity and reduced risks for dementia. Participants were recruited from the Adults Changes in Thought (ACT) study, a longitudinal and population based study which focuses on identify incidence and prevalence AD and other dementia, as well as determining associated risk factors. Data were collected between May 1994 to October 2003 and the sample included 1740 adults aged 65 and older with normal cognitive function. Within the sample, 1.7 % were African American, 93.5% were Whites and 4.6% were categorized as other. Cognitive function was evaluated using the Cognitive Ability Screening Instrument (CASI) and participants were also interviewed to assess memory and functional abilities and gather information on family medical history. Participants

with CASI scores of 86 and those who did not meet the criteria for dementia were included in the study. Physical activity was evaluated using self-reported information on frequency of engagement in physical activity (walking, bicycling, hiking, aerobic activity, weigh training or other exercises) at least three times per week, for 15 minutes, during the past year. Participants were reassessed biennially. According to the study, 1185 participants remained dementia free, 158 developed dementia, 121 withdrew and 276 dies. Findings suggest that among participant who exercised three times per week, the risk of dementia were lower compared to those who exercised less than three times a week.

Additionally, a review by Busse et al. (2006) offers additional support for the significance of physical activity, as a protective factor for cognitive impairment was supported. Moreover, this review elaborated on the types of physical activity which have been shown to contribute to cognitive function and reduce the incidence of cognitive decline and dementia. According to the review, prior research suggests that aerobic exercise may improve cognitive performance and improvements in the executive function may be linked to regular aerobic exercise. In several intervention studies, walking was also associated with maintaining cognitive health. Although studies on the effects of strength training are limited to date, a study by Cassilhas et al. (2007) found that routine participation in resistance training exercise resulted in increased memory. The study included 62 sedentary males aged 65-75 with no cognitive impairment. Participants with cardiovascular complaints, psychiatric conditions, and education level of less than 8 years were excluded. Dementia was evaluated using the modified Mini Mental State Examination. Participants were randomly assigned into three groups: Control (N=23); Moderate (N=19) and High (N=20). To test the effects of strength training on cognitive impairment, participants in the experimental groups participated in a 24-week training regime; three 1 hour sessions per week.

The level of training intensity for the moderate group was 50% and 80% for the high group. Participants in the control group attended warmup and stretching session once time per week. Findings suggest that resistance training may be associated with better cognitive function in older adults.

Results from the Northern Manhattan Study (NOMA, 2016) also support the positive effects of physical activity on cognitive health. The study assessed the benefits of leisure time physical activity (LTPA). LTPA include activities such as walking, gardening hiking, swimming, housework and playing games. The sample included 876 adults aged 71 who completed the baseline assessments in 2003 and the five-year follow-up assessments. Participants completed neurological testing as measured by the Neuropsychological Examination (NPE) a physical examination, and an MRI. During the five -year follow-up, participants completed a second NPE. LPTA was measured by a questionnaire with self-reported information on frequency LPTAs. Finds suggest that individuals who reported light or no exercise had higher rates of cognitive decline compared to participants who reported high intensity activity. According to the study high intensity physical activity may be a significant factor associated with maintaining cognitive health.

There are few studies which focus on older African Americans and their beliefs about physical activity and cognitive health. What is currently known is informed by focus group data. Wilcox et al. (2009) collected data from ten focus groups between November 2005 and August 2007 which targeted older African Americans. Findings suggest that African Americans are aware of the link between physical activity and maintaining cognitive health. In particular, walking was identified most frequently as a type of physical activity. Findings also indicate that among older African Americans, activities of daily living (ADL) which include bathing, dressing and eating;

and instrumental activities of daily living (IADL) which include cooking, driving, shopping, and managing finances were considered as significant activities associated with promoting and maintaining cognitive health.

Sleep Habits

According to the National Sleep Foundation (2004)**,** sleep complaints such as (1) difficulty falling asleep (2) waking a lot during the night (3) waking too early and not getting back asleep (4) waking up feeling tired (5) snoring (6) pauses in breathing and (7) leg sensation are common in adults aged 65 and older. Cricco et al (2001) concluded similar results and their findings indicate that adults aged 65 and older report at least one sleep complaint. Participants were recruited from the Established Populations for Epidemiologic Study (EPESE) and the sample included 6440 adults aged 65 and older from four EPESE sites. Within the sample, 14% were African America. Baseline interviews were conducted between 1981 and 1982 and 1986 and 1987 to include all four sites. Follow-up phone interviews were at year one and year two and in person interviews were conducted in year three. The baseline and year three interview included a neuropsychological assessment; a physical function evaluation, medical history to include a list of chronic conditions, and sleep complaints. Information on alcohol, tobacco, and current medications was also collected. Depression was measured using the Center for Epidemiologic Studies-Depression (CES-D) Scale and cognitive function was evaluated using the Pfeiffer's Short Mental Status Questionnaire (SPMSQ). Sleep complaints were assessed by self-reported responses to questions about frequency of difficulty falling asleep; waking up too early, and not being able to return to sleep. Findings suggest that chronic insomnia may be a predictor of cognitive decline, especially among men.

Furthermore, (Blackwell et. al. (2006) concluded that poor sleep was associated with cognitive function, especially among older women. Participants were recruited from the Osteoporotic Fractures Study (SOF), a longitudinal study focused on examining risk factors for osteoporotic factors and to also examine whether poor sleep quality, as measured by actigraphy, is associated with cognitive function in older women. The sample included 2932 women aged 65 and older. Within the sample, 10.6% were African American. Cognitive function was measured using the Mini Mental State Examination (MMSE) and sleep quality was measured using the Sleep Watch-O, an actigraph which detected and recorded movement. Information was also gathered on medical history, self-reported health status, physical activity, smoking, alcohol use, and caffeine intake. Participants wore the actigraph for a minimum of three 24 hour periods and sleep parameters included: total hours slept per night while in bed; percentage of time that participant slept while in bed; the amount of time it took the participant to fall asleep and the amount of time it took participant to wake up. Findings suggest that women with fewer total hours of sleep per night had a greater risk of cognitive impairment compared to those who slept for more hours. Furthermore, findings indicate an association between sleep latency (amount of time to fall asleep) and risk for cognitive decline among older women.

In another study Nebes et al. (2009) examined the relationship between self-reported sleep and poor cognitive performance. Community dwelling participants interested in aging research were via newspaper advertisements and letters. The sample included older adults aged 65 to 80 who were selected based on their interest to provide insight on the relationship between the intake of over the counter medications (OTC), sleep quality, and cognitive function among older adults. Participants completed a neurologic assessment; medical history and physical exam. A medication list was also obtained and use of OTC within 24 hours of the study was recorded.

Behavioral measures; information processing speed; working memory; inhibitory function; attention shifting; abstract reasoning and episodic memory were assessed. Depression was evaluated using the Geriatric Depression Scale (GDS) and sleep quality was evaluated using the Pittsburgh Sleep Quality Index (PSQI). Based on results from the PSQI, participants were assigned to two groups; good sleepers and poor sleepers. Findings suggested a sleep latency and sleep efficiency are associated with cognitive performance. Within the sample, differences in memory function between the groups were noted. Specifically, good sleeper performed better on test of working memory, attention shifting, and abstract reasoning compared to poor sleepers. Furthermore, poor sleep was associated with depressive symptoms in functional symptoms such as concentration.

Yaffe et al. (2011) also found that sleep disturbances decreased cognitive function thus increasing the risk of cognitive impairment. Similar to the study by Blackwell et al. (2006) participants were recruited from the Osteoporotic Fractures Study (SOF). The primary aim of the study was to assess the impact of sleep disordered breathing (SDB) and hypoxia as risk factors for cognitive impairment and dementia among older women. SDB was defined as frequent interruptions of sleep. Hypoxia was defined as insufficient oxygen levels. The sample included 298 women aged 65 and older without dementia and within the sample, 3.2% were African American. Sleep study data were using the Compumedics Siesta Unit which recorded sleep behaviors. SDB was measured using the apnea-hypopnea index and cognitive function was assessed using the Mini Mental State Examination (MMSE). Dementia diagnosis was determined following expert panel consensus and individuals meeting the criteria were excluded from the study. Participants also completed a neurologic assessment; medical history, physical exam, and BMI evaluation. Depression was evaluated using the Geriatric Depression Scale (GDS). Findings

indicate that within the sample, women with SDB had a greater risk of developing cognitive impairment compared to those with no SDB complaints.

Lastly, a brief by The Alzheimer's Association (2013) supports the link between sleep disturbances and cognitive decline but advises the research has yet to determine a causal relationship. Specifically, the report indicates that the scientific community is continuing to the relationship between sleep and cognitive function to definitely determine whether poor sleep quality and sleep habits are precursors to AD, or if AD leads to sleep complaints such as insomnia and sleep apnea.

In summary, there is limited research on cognitive health and cognitive function among older African Americans. Although existing research indicates that African Americans are at greater risk for cognitive decline compared to other groups, there are few studies that include African Americans. Consequently, what is known about how African Americans perceive cognitive health and the health behaviors associated with maintaining cognitive function is inferred from focus group data. Consistent with the "weathering hypothesis" (Geronomis, 1996), African Americans experience poorer health outcomes over time due to the effects of social inequality, and disparities in rates of cognitive impairment and dementia are further evidence of the persistent social disadvantage. To address this disparity and increase awareness about cognitive health, the CDC launched the HBI to conduct community-level interventions targeting older African Americans. Findings suggest that the initial interventions were successful. However; further research is needed to a better understand how older African Americans perceive cognitive health and cognitive decline and what behaviors are associated with promoting and maintaining cognitive health. To this end, utilizing the KAP Model as a methodological strategy

will enable much needed research on cognitive health among older African Americans, which will potentially reduce health disparities.

Chapter 3 summarizes the research hypotheses, study sample, instrumentation, variables, KAP scale construction and analytic strategy.

CHAPTER 3: METHODS

The present study was cross sectional and used quantitative data to assess the impact of SES as measured by education and income, on knowledge about cognitive decline; attitudes about cognitive decline, and engagement in practices associated with maintaining cognitive health. To explore the relationships between these domains the following hypotheses were tested:

Research Hypotheses

H1. SES as measured by education and income is positively related to knowledge about cognitive decline.

H2. SES as measured by education and income is positively related to higher scores on the attitudes scale regarding the importance and ability to maintain cognitive health.

H3. SES as measured by education and income is positively related to practices associated with maintaining cognitive health.

H4. The effects of SES as measured by education and income on subjective cognitive health is impacted by knowledge, attitudes, and practices associated with maintaining cognitive health.

Study sample

A sample of 120 African Americans women aged 65 and older were recruited from Wayne State University's Institute of Gerontology (IOG) Healthier Black Elders Center Participant Resource Pool for Minority Health and Aging Research (HBEC PRP). The HBEC PRP is part of the National Institutes of Health (NIH) funded Michigan Center for Urban African American Aging Research (MCUAAAR), a joint collaboration between the IOG and University of Michigan's Institute for Social Research. Currently, the HBEC PRP has 1200 enrollees in the registry, all of whom have been re-interviewed or undergone an initial recruitment within the past year. The HBEC PRP registry builds on community based participatory research (CBPR) and as

of August 2015, the sample is 87% female and 13% male. Recent studies indicate that the gender distribution, age distributions, chronic health conditions, and functional abilities of the HBEC PRP participants are representative of older African American Detroit residents. (Ficker et al., 2014; Chadiha et al., 2011; Lichtenberg et al., 2011). There were few (13%) men in the registry. Based on these findings, the present study included women only, as the small number of men in the registry would not support an analysis of sex differences among registry participants.

Data Collection Procedures

Participants were recruited for the study from three sources. The primary means of recruitment involved contacting current HBEC PRP enrollees meeting the study criteria by phone and asking if they would like to participate in the study. A second recruitment strategy identified participants through disturbing flyers at monthly HBEC Lunch and Learn community events and the Art of Aging Conference held in the Detroit area. The third strategy was referral sampling from study participants. Surveys could be completed in person at a public location such as a private room or at a senior community center or by phone if participants lacked access to public transportation. Prior to administering the survey, study procedures were explained in detail and the IRB approved consent form was read in detail before the participant signed. For phone interviews, participants were read in detail the IRB approved oral consent form before completing the interview. A copy of the IRB approved consent and oral consent forms appear in Appendix A.

Data collection took place from April 2015 to August 2015. Semi-structured interviews were conducted in one 45-60 minute session either at the IOG, St. Patrick's Senior Center in Detroit, or by telephone if the participant preferred or lacked transportation. A total of 44.1% of the participants were recruited via the HBEC PRP registry, HBEC Lunch and Learn events and

the Art of Aging Conference; 55.8% of the participants were recruited via referral sampling. Participants not previously registered in the PRP were enrolled prior to completing the survey. A total of 41.7% of the interviews were conducted in person and 58.3% were conducted over the phone. Of the 120 participants who completed the survey, none were excluded from the study for any reason including cognitive impairment. Of the PRP enrollees contacted to participate, seven members declined. All participants provided consent prior to participating in the study. Participants were asked survey questions pertaining to their knowledge about Alzheimer's disease; attitudes about maintaining cognitive health, and behaviors (exercise, diet, sleep, physical activity, brain training) associated with maintaining cognitive health. Individuals with hearing difficulties, non-English speaking, or cognitive difficulties so severe that they are unable to understand or respond appropriately to the survey questions were not eligible for inclusion. There were procedures in place, though not used, for participants who expressed the desire for a memory assessment. The procedure included recommending that they discuss their memory concerns with their primary care physician or the Wayne State University Psychology Clinic if they lack insurance and required a sliding scale fee assessment. If they needed other resources, they were referred to the HBEC. Disclosures of elder abuse were reported to the Michigan Department of Health and Human Services, Adult Protective Services. All participants who completed an interview were given a $25 gift card for their time. Approval for the study was obtained from Wayne State University's Institutional Review Board (IRB 082113B3E). A copy of the approval appears in Appendix A.

Pilot Study

Prior to launching the larger study, a pilot study involving six African American women participants was conducted to ensure that the survey questions were clear and precise. Participants

were recruited from the Detroit area and six interviews were conducted; two phone interviews and four in person interviews. One in person interview was conducted at the IOG and three were conducted at St. Patrick's Senior Center in Detroit and each interview lasted 45 minutes. Participants provided consent prior to participating in the pilot study and received compensation for their participation. Participants ranged in age from 70-82 and the majority of the sample (83%) were retired. More than half were independently in the community (67%) and half were divorced (50%). The sample was well-educated and most graduated from high school (33%), and some had some college experience (33%) or post-graduate degrees (33%). Key recommendations from the pilot study include (1) establishing standardized definitions for key terms (cognitive health, health literacy, and genetics) and (2) providing a brief description of each section of the instrument prior to administering the questions.

Instrumentation

A copy of the questionnaire appears in Appendix B. Using the Knowledge, Attitudes and Practices (KAP) Model (Ryan and Gross, 1943; Valente and Rogers, 1996) this study adapted several existing and valid measures to collect data on perceptions of cognitive health. The KAP Model is used to evaluate health behaviors and habits across three domains: knowledge, attitudes, and practices. Knowledge is defined as a set of understandings or a way of perceiving. Attitudes are ways of being or "tendencies to" which may not be directly observable. Practices are observable actions by individual relative to cognitive decline. The survey instrument used in this study consisted of 64 items to assess knowledge, attitudes, and practices associate with maintaining cognitive health; 63 closed ended questions and one optional qualitative question which allowed participants to share information about their own knowledge, attitudes, and practices related to maintaining cognitive health.

Knowledge was measured using an adapted version of scales developed from Robert et, al (2000) study titled *Illness Representations Among First Degree Relatives of People With Alzheimer's Diseas*e. This study included 11 items to assess concern about and susceptibility to AD knowledge about risk and protective factors for AD. They are questions 28-38 in the questionnaire.

Concern about and Susceptibility to AD

Perceived threat of AD was assessed by three questions developed by Roberts et al (2000). Participants were asked (see questions 28-30 in the questionnaire):

(1) Do you agree with the following statement? "I would like to know my chances of someday getting AD."
(2) Do you agree with the following statement? "I believe I will get AD someday."
(3) Do you agree with the following statement? "I worry about getting AD."

Participants indicated their level of agreement (i.e. strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree).

Knowledge and beliefs about risk and protective factors for AD

Knowledge and beliefs about risk and protective factors for AD was assessed based on six questions developed by Roberts et al. (2000) and two true/false questions adapted from the Alzheimer's Disease Knowledge Scale (ADKS) (Carpenter, et al., 2009). Participants were asked (see questions 31-38 in the questionnaire):

(1) How important is stress in increasing a person's chance of getting AD?
(2) How important are genetics in increasing a person's chance of getting AD?
(3) How important is keeping physically in lowering a person's chances of getting AD?
(4) How important is keeping mentally active in lowering a person's chances of getting AD?
(5) How important is eating a healthy diet in lowering a person's chances of getting AD?
(6) How important is taking vitamins or dietary supplements in lowering a person's chances of getting AD?
(7) Prescription drugs that prevent Alzheimer's disease are available?
(8) Having a parent with Alzheimer's disease increases the chances of developing it?

For questions one through six, participants indicated their level of importance (i.e. very important, somewhat important or not at all important). For questions seven and eight, participants responded either true or false.

Attitudes about Cognitive Health

Attitudes about cognitive health was assessed by three items adapted from the Expectations of Aging Well Survey (ERA-38) (Sarkisian et al., 2000). Participants were asked (see questions 39-41 in the questionnaire):

(1) Do you agree with the following statement? "Maintaining my cognitive health is important to me as I age."
(2) Do you agree with the following statement? "There are things that I can do to help maintain my cognitive health as I age."
(3) Do you agree with the following statement? "I am concerned about my cognitive health as I age."

Participants indicated their level of agreement (i.e. agree, somewhat agree, or do not agree).

Practices associated with maintaining cognitive health

According to the CDC Health Brain Initiative (2011) sleep, diet and nutrition, physical activity, and brain training exercises contribute to maintaining cognitive health. Adapted versions of the Pittsburgh Sleep Quality Index (PSQI), the Seniors in the Community: Risk Evaluation for Eating and Nutrition (SCREEN) Tool, and The Community Health Activities Model Program for Seniors (CHAMPS) were used to assess sleep quality, diet and nutrition, physical activity and brain training (Buysse et al., 1989; Keller, 2004; Gillis at al., 2003).

Sleep Habits

Sleep habits were assessed based on eight questions adapted from the Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989). Participants were asked (see questions 45-52 in the questionnaire):

(1) During the past month, when have you usually gone to bed?

(2) During the past month, how long (in minutes) does it usually take you to fall asleep?

(3) During the past month, when have you usually gotten up in the morning?

(4) During the past month, how many hours of actual sleep did you get last night? (This may be different than the number of hours that you spend in bed).

(5a) Do you wake in the middle of the night or early in the morning?

(5b) Do you have problems breathing, snoring or coughing at night?

(5c) Are there other reasons that you have trouble sleeping?

(6) During the past month, how would you rate your sleep quality overall?

(7) During the past month, how often have you taken medicine (prescription or "over the counter") to help you sleep?

(8) During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

Participants provided self-reported information on their usual bed time, number of minutes it took to fall asleep, and usual time that they got up. Level of sleep problems (i.e. not during the past month, less than once a week, once or twice a week, three or more times a week, not sure). Overall quality of sleep (i.e. very good, fairly good, fairly bad, very bad, not sure).

Diet and Nutrition

Diet and nutrition habits were assessed based on 14 questions adapted from the Seniors in the Community: Risk Evaluation for Eating and Nutrition Tool (SCREEN I) (Keller, 2004). Participants were asked (see questions 14-27 in the questionnaire):

(1) How many foods do you limit or avoid because of a health condition or because they disagree with you?

(2) How often do you usually eat?

(3) How many times a day do you eat fruits or vegetables (canned, fresh, frozen, or juice)?

(4) How many times do you eat meat, eggs, fish, poultry, or meat alternatives (such as dried peas, beans, lentils, nuts, or tofu)?

(5) How many cups of (250ml or 8oz.) of fluids do you drink each day (tea, coffee, water, juice, milk or soft drinks)?

(6) How often do you find it hard to bite or chew foods?

(7) How often do you choke, cough, or have pain when you swallow food or fluids?

(8) When you eat alone, how often do you eat good, healthy foods?

(9) How often do you take meal replacements or drink supplements like Boost or Ensure?

(10) How is your appetite usually?

(11) Do you agree with the following statement? "I have enough money to buy the food I need".

(12) If you do your own cooking, how often do you find it difficulty (physically, lack of interest, stressful, lack of skill)?

(13) If you do your own shopping, how often do you find it difficulty (physically, lack of interest, stressful, lack of skill)?

(14) Has your weight changed in the past 6 months? How much as your weight changed?

Participants indicated frequency of food intake (i.e. at least three times a day, at least three times a day - five or six days a week, at least three times a day - three to four days a week, two times a day, less than two times a day, do not know. Adaptations, physiologic and functional barriers (i.e. never, rarely, sometimes, often, always). Appetite (i.e. very good, good, fair, poor, very poor).

Brain Training Exercises and Physical Activity

Brain training exercises and physical activity were measured by an adapted version of The Community Health Activities Model Program for Seniors (CHAMPS) (Gillis et al., 2003). Six items measured participation in physical activities during a four-week period, 11 items measured participation in brain training exercises during a four-week period, and one item asked about other activities not mentioned. Participants were asked (see questions 43 and 44 in the questionnaire):

1. In a typical week, during the past four weeks did you watch television (games shows, educational programs, documentaries)?
2. In a typical week, during the past four weeks did you listen to the radio (news programs, sports program)?
3. In a typical week, during the past four weeks did you prepare meals from recipes?
4. In a typical week, during the past four weeks did you play cards, chess, bridge or knowledge games?
5. In a typical week, during the past four weeks did you play board games of skill or chance?
6. In a typical week, during the past four weeks did you take a course (arts and crafts, writing, computer classes)?
7. In a typical week, during the past four weeks did you do routine financial work (pay bills, check bank accounts)?
8. In a typical week, during the past four weeks did you drive?
9. In a typical week, during the past four weeks did you do puzzles (Scrabble, Sudoku, crossword puzzles)?
10. In a typical week, during the past four weeks did you make lists?
11. In a typical week, during the past four weeks did you read (newspapers, books, magazines)?
12. In a typical week, during the past four weeks did you dance?
13. In a typical week, during the past four weeks did you do yoga or Tai Chi?

14. In a typical week, during the past four weeks did you walk?
15. In a typical week, during the past four weeks did you go bicycling?
16. In a typical week, during the past four weeks did you stretch for exercise?
17. In a typical week, during the past four weeks did you housework (light, moderate, heavy)?
18. In a typical week, during the past four weeks did you do other types of physical activities or brain training exercises not previously mentioned?

Participants indicated level of participation physical activity and brain training exercises (i.e. yes or no). If participants responded yes, they were asked to report how many times per week during the past four weeks they participated in the activity.

Consistent with other studies on cognitive aging, perceived cognitive impairment and depression were also measured. Questions developed by the Michigan Dementia Coalition, and included in the Center for Disease Control (CDC) Behavioral Risk Factor Surveillance System (CDC-BFSS), Cognitive Impairment Module (Lichtenberg et al., 2011) were used to perceived cognitive impairment. Depression was measured by a scale adapted from the Patient Health Questionnaire (PHQ-2) (Pfizer, 1999).

Perceived Cognitive Impairment

Perceived cognitive impairment was assessed by three yes/no questions. Participants were asked (see questions 11-13 in the questionnaire):

(1) Are your memory, thinking skills, or ability to reason worse than a year ago?
(2) If yes, has it interfered with your everyday activities (e.g. shopping, paying bills, driving)?
(3) Has a physician or other health care professional evaluated your memory or thinking?

Depression

Depression was measured using two items adapted from the PHQ. Participants were asked (see question 9 in the questionnaire):

1. Over the past two weeks, how often have you been bothered by any of the following problems?
   (a) Little interest or pleasure in doing things?
   (b) Feeling down, depressed or hopeless?

Participants indicted level of depression (i.e. not at all, several days, more than half the days, nearly every day).

Subjective Reflections on Maintaining Cognitive Health

Participants were also invited to share their experiences and insights about their own knowledge, attitudes and practices and maintain cognitive health. Participants were asked (see question 64 in the questionnaire):

1. Is there anything else you would like to tell me about your knowledge, attitudes, and practices related to maintaining your cognitive health?

Recent literature (Duncan et al., 2002; Grundy et al., 2001; Robert et al., 1996; Daly et al., 2001) also indicates that income level, education level, current or former occupation, and financial assets are optimal socioeconomic (SES) measures among older adults. The literature also suggests that age, gender, marital status, health status, health literacy and social support are factors associated with cognitive health.

Sociodemographic Characteristics

Participant's age was self-reported as age on last birthday. Living situation was reported using a 3-point ordinal scale (i.e. 1-independent community dweller (living in own home or apartment), 2-assisted living, 3-living with family or relatives. Marital status was reported using a 5-point scale (i.e. 1-single (never married), 2- married or living as married, 3-separated but not divorced, 4-divorced, 5-widowed). Marital status was recoded (i.e. 1-married, 0-other). Level of education was reported using an 8 point scale (i.e. 1-never attended school, 2-only attended kindergarten, 3-grades 1-8 (elementary), 4-grades 9-11 (some high school), 5-grade 12 or GED (high school diploma), 6- college 1-3 years, 7- college 4 years (college degree), 8- Post Bachelor graduate degree). Income was reported using a 4 point scale (i.e. 1=< than $20,000, 2=$20,000-$39,000, 3=$40,000-$64,000, 4=$65,000 and above). Occupation was reported using a 7 point

scale (i.e. 1-employed for wages, 2-self-employed, 3-retired-4-a student, 5-disabled, 6-unemployed, 7-homemaker). Participants were also asked to report their current or past occupation.

Health Status

Health status was measured by one item adapted from the Center for Disease Control (CDC) Behavioral Risk Factor Surveillance System (BFSS) Health Status Questionnaire (2000). Participants were asked (see question 8 in the questionnaire):

1. How would you rate your health compared to others?

Health status was reported using a five-point scale (i.e. 1-excellent, 2-very good, 3=good, 4=fair good, 5=poor). This variable was coded so that a higher value is associated with poor self-reported health.

Social Support

Social support was measured using six items adapted from the eight item modified Medical Outcome Study Social Support Survey (sMOS-SS) (Hayes et al., 1995). Participants were asked (see questions 54-59 in the questionnaire):

1. If you needed support, how often would you have someone to help you if you were confined to bed?
2. If you needed support, how often would you have someone to listen to you when you need to talk?
3. If you needed support, how often would you have someone to give you good advice about a crisis?
4. If you needed support, how often would you have someone who shows you love and affection?
5. If you needed support, how often would you have someone to give you information to help you understand a situation?
6. If you needed support, how would you have someone to share your most private worries and fears with?

Participants provided self-reported information on the number of close friends and close relatives. Participants indicated level of social support (i.e. none of the time, a little of the time, some of the time, most of the time, all of the time).

Health Literacy

Health literacy was measured by three items adapted from Health Literacy Screening Tool (HLST) (Chew et al., 2004) and one item pertaining to confidence in accessing health related information which was created specifically for this study. Participants were asked (see questions 60-63 in the questionnaire):

1. How often do you need to have someone help you when you read instructions, pamphlets, or other written material from you doctor or pharmacy?
2. How often do you have problems learning about your health because of difficulty understanding written material?
3. How confident are you filling out medical history and insurance forms by yourself?
4. How confident are you accessing health related information from the Internet?

Participant indicated level of health literacy (1=none of the time, 2= a little of the time, 3=some of the time, 4=most of the time, 5= all of the time). This variable was coded so that a high value is associated with poor health literacy.

Independent Variables

SES as measured by education and income are the independent (predictor) variables in this study.

Dependent Variable

Subjective cognitive health is the dependent (outcome) variable in this study. Participants were asked (see question 10 in the questionnaire):

1. How would you rate your memory?

Subjective cognitive health was reported using a five-point scale (i.e. 1-poor, 2-fair, 3=good, 4=very good, 5=excellent). This variable was coded so that a higher value is associated with greater subjective health as measured by memory.

KAP Variables

The KAP variables are intervening variables that help to clarify the mechanisms by which SES as measured by education and income is linked to subjective cognitive health. Knowledge was measured by questions pertaining to knowledge and beliefs about risk and protective factors to AD and questions pertaining to concern and susceptibility to AD. Attitudes were measured by questions pertaining to attitudes about cognitive health. Practices were measured by questions pertaining to diet and nutrition habits, sleep habits during a four-week time frame, and questions pertaining to participation in brain training exercises and physical during a four-week time frame.

Figure 2. KAP Scale Construction

Knowledge	Attitudes	Practices
Risk and Protective Factors for AD Concern/Susceptibility to AD	Attitudes about Cognitive Health	Diet and Nutrition Sleep Habits Brain Training Physical Activity
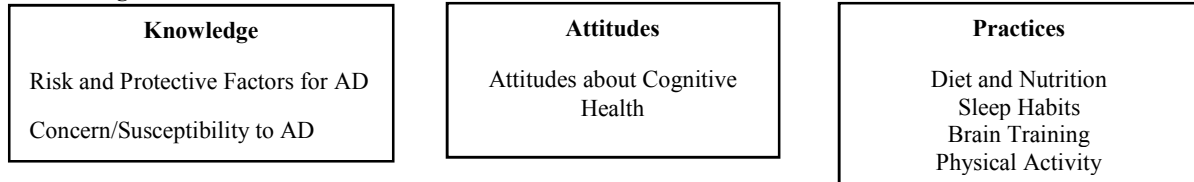
KAP Scale Construction

Figure 1. above illustrates how the KAP scales were constructed. Knowledge was measured by two subscales: beliefs about protective factors for AD ("protective") and concern and susceptibility to AD ("concern"). Attitude was measured by one scale ("attitudes"). Practices was measured by five subscales: diet and nutrition ("healthy eating" and "barriers to healthy eating"), sleep habits ("sleep problems"); activity ("brain training exercises" and "physical activity"). Exploratory factor analysis was conducted on the items used to create each KAP scale and subscales. Factor analysis on all scales and subscales was analyzed using maximum likelihood

with a Vaimax rotation and Principal Component analysis to simplify the interpretation of the factors (Field, 2009).

Knowledge Scales

The "protective "subscale included four items which assessed the importance of protective factors in reducing the chance of getting AD. Items in this subscale were coded to so that higher values were associated with greater importance of each protective factor. A factor analysis was run and yielded one factor which explained 50.2% of the cumulative variance. A reliability analysis was run to examine internal consistency. The "protective" subscale was calculated from the mean of the four items. Cronbach's alpha for this subscale was .64.

The "concern" subscale included two items which assessed worry and concern about susceptibility to AD. A reliability analysis was run to examine internal consistency. The "concern" subscale was calculated from the mean of the two items. Cronbach's alpha for this subscale was .77.

Attitude Scale

The "attitudes" scale included three items which assessed attitudes about cognitive health. A factor analysis was run and yielded one factor which explained 65.5% of the cumulative variance. A reliability analysis was run to examine internal consistency. The "attitudes" scale was calculated from the mean of the three items. Cronbach's alpha for this scale was .64.

Practices Scales

Diet and Nutrition

The "healthy eating" subscale included three items which assessed eating habits. A factor analysis was run and yielded one factor which explained 62.4% of the cumulative variance. A

reliability analysis was run to examine internal consistency. The "healthy eating" subscale was calculated from the mean of the three items. Cronbach's alpha for this subscale was .44.

The "eating barriers" subscale included six items which assessed potential barriers to healthy eating. A factor analysis was run and yielded two factors which explained 57.9% of the cumulative variance. A reliability analysis was run to examine internal consistency. The "barriers to eating" subscale was computed from the mean of the six items. Cronbach's alpha for this subscale was .66.

Sleep Habits

The "sleep problem" subscale included six items which assessed sleep quality. Items were coded to reflect the absence or presence of a self-reported sleep barrier (1=problem, 0=no problem). The "sleep problem" subscale was calculated by creating a summated index measuring a count of sleep problems.

Factor analysis was not conducted on the sleep subscale as the purpose of the subscale was to determine the frequency of sleep barriers rather than identify any relationships between the items.

Activity

The "brain training exercises" subscale included 11 items which assessed participation in brain training activities each week, during a four-week time frame. Items were coded to reflect participation or non-participation (1=yes, 0=no). The "brain training exercises" subscale was calculated by creating a summated index measuring a count of participation in brain training exercises.

Factor analysis was not conducted on the brain training subscale as the purpose of the subscale was to determine the frequency of the engagement in brain training exercises rather than identify any relationships between the items.

The "physical activity" scale included six items which assessed participation in physical activity each week, during a four-week timeframe. Items were coded to reflect participation or non-participation (1=yes, 0=no). The "physical activity" subscale was calculated by creating a summated index measuring a count of participation in physical activity.

Factor analysis was not conducted on the physical activity subscale as the purpose of the subscale was to determine the frequency of the engagement in physical activity rather than identify any relationships between the items.

Social Support and Health Literacy Scales

Social support was measured by one scale ("social support") and health literacy was measured by two subscales: ("literacy problems") and ("literacy confidence"). Exploratory factor analysis was conducted on the items used to create the social support scale and health literacy subscales. Factor analysis on all scales and subscales was analyzed using maximum likelihood with a Varimax rotation and Principal Component analysis to simplify the interpretation of the factors (Field, 2009).

Social Support

The "social support" scale included six items which assessed access to social support. A factor analysis was run and yielded one factor which explained 67% of the cumulative variance. A reliability analysis was run to examine internal consistency. The "social support" scale was calculated from the mean of the six items. Cronbach's alpha for this scale was .89.

Health Literacy

The "literacy problems" subscale included two items which assessed health literacy. Items in this subscale were coded so that lower values were associated with better health literacy. A factor analysis was run and yielded one factor which explained 87.2% of the cumulative variance.

A reliability analysis was run to examine internal consistency. The "literacy problems" subscale was calculated from the mean of the two items. Cronbach's alpha for this scale was .85.

The "literacy confidence" subscale included two items which assessed confidence in health literacy. Items were coded so that a high scores reflect high confidence in health literacy. A factor analysis was run and yielded one factor which explained 76.9% of the cumulative variance. A reliability analysis was run to examine internal consistency. The "literacy confidence" subscale was calculated from the mean of the two items. Cronbach's alpha for this scale was .67.

Data Entry

All data were manually entered into SPSS (version 23) and screened for missing items. Frequency distributions were also conducted to validate data.

Data Analysis

The analysis controlled for the effects of demographic variables (age, marital status). Additional analyses included the variables of health status, health literacy, and social support. Health status is an important measure because it affects attitudes and practices associated with maintaining cognitive health (Williams et al., 2010). Similarly, health literacy and social support are important measures because health literacy affects knowledge about cognitive health which directly impacts attitudes about cognitive health and practices associated with maintaining cognitive health (Day et al., 2009). The SES variables as measured by income and education are hypothesized to be primary predictors of KAP. According to the literature, income level (as measured by Social Security or pension disbursements) and financial assets (as measured by home equity and savings account) are optimal indicators of SES among older adults (Duncan et al., 2002; Grundy et al., 2001; Robert et al., 1996; Daly et al., 2001). The dependent variable is

subjective cognitive health. The KAP variables are intervening variables that help to clarify the mechanisms by which SES (as measured by education and income level) are linked to subjective cognitive health.

Several existing studies (ADKS, Carpenter et al. 2009; BRFSS, Centers for Disease Control, 2011; MNA, Rubenstein et al., 2001, PSQI, Buysse et al., 1989; CHAMPS, Gillis et al., 2003) support the use of these scales to capture knowledge, attitudes and behaviors relevant for maintaining cognitive health. Although the scales were not validated with separate analyses for African Americans, the standardized administration of the scales was followed so that future work can examine the utility of the scales in older African Americans.

Analytic Strategy

Data analyses were conducted to test the hypotheses of the present study. In Step 1, several regression analyses were conducted to determine if SES predicts knowledge, attitudes, and practices associated with maintaining cognitive health. In Step 2, several regression analyses were conducted to determine if SES and the KAP measures are predictors of subjective cognitive health. In each analysis, age, marital status, health literacy and social support were controlled for. A heuristic outline of the process is displayed in Figure 1 below.

Step 1. KAP and SES

H1: The first hypothesis was tested using a linear regression model. To determine if SES predicts factual knowledge about cognitive decline, the knowledge subscales ("protective factors and "concern and susceptibility") were regressed on SES.

H2. The second hypothesis was tested using a linear regression model. To determine if SES predicts attitudes about cognitive decline, the attitudes scales were regressed on SES.

H3. The third hypothesis was tested using a linear regression model. To determine if SES predicts engagement in practices associated with maintaining cognitive health, the five practices subscales ("healthy eating" "eating barriers", "sleep problems", "brain exercises" and "physical activity") were regressed on SES.

Step 2. KAP and SES predicting subjective cognitive health (SCH)

H4. A series of linear regression models were conducted to determine if SES and the KAP measures are predictors of subjective cognitive health. To predict the effects of SES and knowledge, the knowledge subscales ("protective factors and "concern and susceptibility") were regressed on subjective cognitive health. To predict the effects of SES and attitudes, the attitudes scale was regressed on subjective cognitive health. To predict the effects of SES and practices, the five practices subscales ("healthy eating" "eating barriers", "sleep problems", "brain exercises" and "physical activity") were regressed on subjective cognitive health.

Figure 3. Conceptual Model
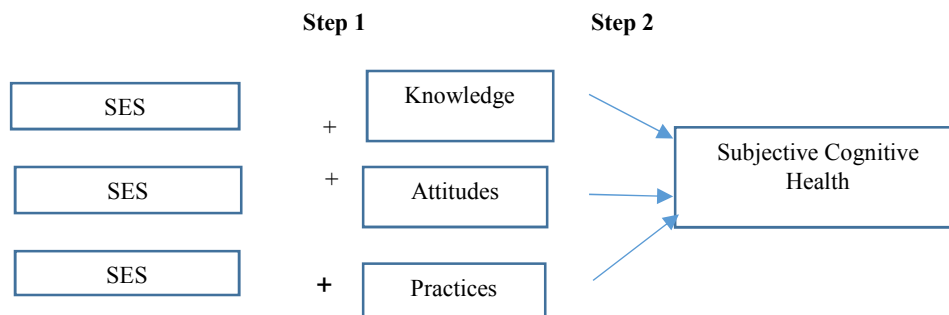
Chapter 4 provides a summary of results of descriptive characteristics including sample and the KAP variables.

CHAPTER 4: RESULTS

Sample Characteristics

This chapter describes the sociodemographic characteristics as well as the knowledge, attitudes, and practice variables used in this analysis. Table 4.1 summarizes the demographic characteristics of the sample. The mean age was 73 years with most of the sample (83.4%) between 65 and 79 years old. The majority were independent community dwellers (98%) and only 2.5% reported that they lived with a family member. Only one quarter of the sample were married or living as married (26.7%) and more than half (73.3%) were single, separated, divorced or widowed. The sample was well educated and most of the participants graduated from high school (16.7%), had some college experience (37.5%), graduated from college (14.2%) or earned post graduate degrees (27.5%). A quarter of respondents earned less than $25,000 annually. Based on data from the US Census, American Community Survey (ACS), the average African American female residing in Detroit reports an income of $27,000 (ACS, 2013). These data suggest that the study sample was not representative of African American females residing in the Detroit area in terms of income. Thus, the typical respondent in the study was 73 years old, lived independently, was not married, and was well educated, retired, and earned less than $40,000. About 11% reported fair health, and less than 11% reported fair memory.

Table 4.1. Demographics and Subjective Health Status	Total (N=120)	
Characteristics	**n**	**%**
Age (years)		
65	12	10.0
66	5	4.2
67	12	10
68	9	7.2
69	12	10
70	4	3.3
71	7	5.8
72	4	3.3
73	10	8.3
74	3	2.5
75	4	3.3
76	8	6.7

77	5	4.2
78	2	1.7
79	3	2.5
80	4	3.3
81	2	1.7
82	2	1.7
83	1	0.8
84	4	3.3
85	1	0.8
86	1	0.8
87	1	0.8
88	1	0.8
89	1	0.8
90	3	2.5

Marital Status

Married	32	26.7
Single (never married)	7	5.8
Separated (but not divorced)	3	2.5
Divorced	44	36.7
Widowed	34	28.3

Living Situation

Independent community dweller	117	97.5
Living with family/relatives	3	2.5

Highest education completed

Grades 9-11	3	2.5
Grade 12 or GED	20	16.7
College 1-3 years	45	37.5
College degree	17	14.2
> College degree	33	27.5

Annual Family Income (including benefits)

<$20,000	30	25.0
$20,000-$39,000	31	25.8
$40,000-$64,000	35	29.2
$65,000 and above	20	16.7

Employment Status

Employed for wages	14	11.7
Self-employed	4	3.3
Retired	98	81.7
Disabled	3	2.5
Homemaker	1	0.8

Self-reported health

Excellent	18	15.0
Very Good	40	33.3
Good	49	40.8
Fair	13	10.8

Self-reported memory (subjective cognitive health)

Excellent	10	8.3
Very Good	45	37.5
Good	52	43.3
Fair	13	10.8

Knowledge Items

Concern and susceptibility to AD

Table 4.2 summarizes responses to items pertaining to concern about and susceptibility to AD. Almost two-thirds of the sample (65.8%) strongly agreed that they would like to know their chances of someday getting AD. While 40% strongly disagreed that they believe that they will get AD someday, 54.1% either somewhat disagreed or strongly disagreed with the statement that they worry about getting AD. Thus, the typical respondent would like to know their chance of getting AD, but less than half felt they would develop AD. The women tended to deny worrying about getting AD.

Table 4.2 Concern and Susceptibility to AD

Concerns and Susceptibility to AD	Frequency	%
Know chances of getting AD		
Strongly agree	79	65.8
Somewhat agree	26	21.7
Neither agree nor disagree	6	5.0
Somewhat disagree	2	1.7
Strongly disagree	7	5.8
Will get AD someday		
Strongly agree	6	5.0
Somewhat agree	13	10.8
Neither agree nor disagree	33	27.5
Somewhat disagree	20	16.7
Strongly disagree	48	40.0
Worry about getting AD		
Strongly agree	13	10.8
Somewhat agree	30	25.0
Neither agree nor disagree	12	10.0
Somewhat disagree	19	15.8
Strongly disagree	46	38.3

Knowledge and Beliefs about Risk and Protective Factors

Table 4.3 summarizes responses to items pertaining to knowledge and beliefs about risk and protective factors for AD. According to the validated AKDS (Carpenter et al., 2009; Szekly et al., 2007; Small et al., 1997, Alzheimer's Association, 2005) the correct response for the item

pertaining to the availability of prescription drug to treat AD is false, and the correct response for the item pertaining to whether having a parent with AD increases the chances of getting AD is true. More than half the sample (72.1%) correctly answered the question regarding the lack of availability of prescription drugs that prevent AD. The majority (60.4%) also correctly answered that having a parent with AD increases the chances of developing it. The questions pertaining to risk for AD do not have definitive answers in the scientific literature and are still under investigation. About half of the sample (53%) think that stress is very important to increasing the risk for AD. Genetics are seen as very important (39.7%) or somewhat important (48.3%) in increasing the risk for AD. Keeping physically active (79.8%), keeping mentally active (91.7%) and eating a healthy diet (66.7%) were identified as very important factors in reducing the risk for AD. Forty-seven percent of the sample also think that taking vitamins or dietary supplements is somewhat important to reducing risk and another 25% say they are very important for risk reduction. In summary, the sample had significant factual knowledge AD. Most were aware of the lack of available drugs to prevent AD and the increased risk associated with having a parent with AD. Consistent with current research on protective factors for AD, most of the sample reported that keeping physically and mentally active, and eating a healthy diet are important to reducing the risk for AD.

Table 4.3 Knowledge and beliefs about risk and protective factors for AD

Knowledge and beliefs about risk and protective factors for AD	Frequency	%
Drugs that prevent AD are available		
True	31	27.9
False	80	72.1
Having a parent with AD increases chances of AD		
True	67	60.4
False	44	39.6
Importance of stress in increasing chances of AD		
Very important	62	53.0
Somewhat important	42	35.9
Not at all important	13	11.1
Importance of genetics in increasing chances of AD		

Very important	46	39.7
Somewhat important	56	48.3
Not at all important	14	12.1
Importance of physical activity in reducing chances of AD		
Very important	95	79.8
Somewhat important	22	18.5
Not at all important	2	1.7
Importance of mental activity in reducing chances of AD		
Very important	110	91.7
Somewhat important	10	8.3
Importance of healthy diet in reducing chances of AD		
Very important	80	66.7
Somewhat important	33	27.5
Not at all important	7	5.8
Importance of taking vitamins in reducing chances of AD		
Very important	29	25.0
Somewhat important	55	47.4
Not at all important	32	27.6

Attitudes about Cognitive Health

Attitudes

Table 4.4 summarizes responses to items pertaining to attitudes about cognitive health. Almost all respondents agreed that maintaining their cognitive health is important as they age (97%) and that there are things that they can do to help maintain their cognitive health (90%). The majority (84.2%) also indicated that they worry about their cognitive health as they age. Overall, the women believe that maintaining cognitive health is important and while they believe that they can manage their cognitive health, they also worry about it as they get older. Findings regarding worrying about cognitive health and worrying about getting AD differ within the sample. While 54.1% either somewhat disagreed or strongly disagreed with the statement that they worry about getting AD, 84.2% agree that they worry about their cognitive health as they age. A possible explanation for this inconsistency is that the items pertaining to beliefs and susceptibility and the items about attitudes about cognitive health may not have been clear enough for participants to accurately respond.

Table 4.4 Attitudes about Cognitive Health

Attitude Items	Frequency	%
Maintaining cognitive health is important		
Agree	116	96.7
Somewhat agree	3	2.5
Not Agree	1	0.8
Things I can do to maintaining cognitive health		
Agree	108	90.0
Somewhat agree	11	9.2
Not Agree	1	.8
Concerned about cognitive health		
Agree	101	84.2
Somewhat agree	11	9.2
Not Agree	8	6.7

Practices Items

<u>Sleep Items</u>

Table 4.5 summarizes items pertaining to sleep quality and sleep problems. Most of the sample reported very good (46.1%) or fairly good (40.9%) sleep quality. Although the majority (95.8%) reported waking during the middle of the night, almost three-quarters (72.5%) reported that they did not have problems breathing, snoring, or coughing. Most did not experience any other sleep problems (63.3%), did not take medications to help them sleep (88.3%) or have trouble staying awake while driving, eating meals, or engaging in social activity (90%). Thus, sleep problems did not bother the majority of the women, although almost all reported walking up in the middle of the night.

Table 4.5 Sleep Items

Sleep Habits	Frequency	%
Waking during the night		
Yes	115	95.8
No	5	4.2
Problems breathing, snoring, or coughing at night		
Yes	33	27.5
No	87	72.5
Other sleep problems		
Yes	44	36.7
No	76	63.3

Self-reported sleep quality		
Very good	53	46.1
Fairly good	47	40.9
Fairly bad	9	7.8
Very bad	6	5.2
Take sleep medications		
Yes	14	11.7
No	106	88.3
Trouble staying awake		
Yes	12	10.0
No	108	90.0

Diet and Nutrition Items

Table 4.6 summarizes items pertaining to diet and nutrition. Studies suggest that maintaining a healthy diet and practicing good eating habits is associated with better cognitive health. According to the Dietary Guidelines for Americans 2010 (US Department of Agriculture and US Department of Health and Human Services), adults 50 and older should eat two cups of fruits and vegetables per day; 6oz. of grain per day, 3 cups of dairy, 5 ozs. of protein and drink between 6-8 cups of 8 oz. fluids per day in order to maintain and promote a healthy lifestyle. Most of the sample reported very good (49.2%) or good (40%) appetites. Most (42.9%) ate meals two times a day; ate fruits and vegetables two or more times per day (44.5%) and about a third ate meat, eggs, fish, poultry or meat alternatives two or more times a day (36.5%). Most drank five or more cups of 8oz. fluids each day (57.5%) and also limited one or two foods because of a health condition or because the foods disagree with them and (52.5%). More than half (61.7%) reported no difficulty biting or chewing food. A similar percent did not experience choking, coughing or pain when swallowing (60.8%). More than half never took meal replacements such as Boost or Ensure (79.2%) and when eating alone, almost half reported eating healthy meals often (49.1%). More than three-quarters strongly agreed that they had enough money to buy the food that they

needed (76.8%) and the majority never experienced difficulty cooking (70%) or shopping (76.6%). More than 40% reported that their weight had not changed during the past six months (41.7%), but almost a third reported weight loss and 23.3% reported gaining weight. Of those reporting a change in weight, most reported a weight gain between 2 and 5 pounds (26.7%). Overall, the women had good appetites and healthy eating habits; did not have difficulties which prevented their practicing healthy eating habits and most reported that their weight had not changed during the past six months. Of those reporting weight changes, it is unclear as to what factors may have contributed to a change in weight.

Table 4.6. Diet and Nutrition Items

Diet and Nutrition Habits	Frequency	%
Limit foods due to health		
None	38	31.7
One or two	63	52.5
Quite a few	16	13.3
Enough to make it hard to eat with others	2	1.7
Enough to make diet restricted	1	.8
Frequency of eating		
At least three times a day each day	38	31.9
At least three times a day each day, five or six days a week	18	15.1
At least three times a day each day, three to four days a week	9	7.6
Two times a day	51	42.9
Less than two times a day	3	2.5
Fruits and vegetables per day		
Five or more times a day	10	8.4
Four or more times a day	8	6.7
Three or more times a day	25	21.0
Two or more times a day	53	44.5
Less than two times a day	23	19.3
Meats, eggs, fish, poultry per day		
Two or more times each day	42	36.5
Once each day	26	22.6
Five or six times a week	17	14.8
Three or four times a week	25	21.7
Less than three times a day	5	4.3
8 oz. fluids (tea, water, coffee, milk, soft drinks) per day		
Five or more	69	57.5
Four	39	29.2
Three	13	10.8
Two	2	1.7
Less than two	1	.8

Difficulty biting or chewing

Never	74	61.7
Rarely	25	20.8
Sometimes	15	12.5
Often	5	4.2
Always	1	.8

Difficulty choking, coughing or pain when swallowing

Never	73	60.8
Rarely	37	30.8
Sometimes	7	5.8
Often	2	1.7
Always	1	.8

Meal Replacement

Never	95	79.2
Rarely	14	11.7
Sometimes	10	8.3
Often	1	.8

Healthy meals when eating alone

Always	36	32.7
Often	54	49.1
Sometimes	20	18.2

Self-reported appetite

Very good	59	49.2
Good	48	40.0
Fair	12	10.0
Poor	1	.8

Money to Buy Food

Strongly agree	86	76.8
Agree	20	17.9
Neither agree or disagree	3	2.7
Strongly disagree	3	2.7

Difficulty Cooking

Always	1	.8
Often	19	15.8
Sometimes	13	10.8
Rarely	3	2.5
Never	84	70.0

Difficulty Shopping

Often	2	1.7
Sometimes	14	11.7
Rarely	12	10.0
Never	92	76.7

Weight Changes in past 6 months

Lost	39	32.5
Gained	28	23.3
Not changed	50	41.7
Does not know if weight has changed	3	2.5

Amount of weight change

No change in weight	52	45.8
> 10 pounds	16	13.3
6-10 pounds	19	15.8
2-5 pounds	32	26.7

	1	.8
<2 pounds		

Activity Items

Brain Training Exercises

Table 4.7 summarizes responses about brain training exercises. In a typical week, during the past 4 weeks, the majority of the sample participated in brain training exercises such as watching game shows or educational programs on television (94.2%); driving (80.8%), doing routine financial work (100%), doing puzzles such as Scrabble, Sudoku, or crossword (63.3%), list making (84.2%) and reading books, magazines or newspapers (95.7%). Few participants engaged in brain training exercises such as cooking from recipes (38.3%); playing board games (27.5%), or taking a course (15%). The most frequent brain training exercise were watching educational programs on television, driving, doing routine financial work, doing puzzles, list making, and reading. Cooking from recipes, playing board games and taking courses were not popular brain training exercises.

Table 4.7. Practices Items – Brain Training Exercises

Brain Training Exercises	Frequency	%
Watch tv (game shows, educational programs)		
Yes	113	94.2
No	7	5.8
Listen to the radio		
Yes	52	43.3
No	68	56.7
Cook from recipes		
Yes	46	38.3
No	74	61.7
Play knowledge games (cards, chess, bridge)		
Yes	53	44.2
No	67	55.8
Play board games		
Yes	33	27.5
No	87	72.5
Take a course		

	18	15.0
Yes	18	15.0
No	102	85.0

Routine financial work

Yes	120	100

Driving

Yes	97	80.8
No	23	19.2

Puzzles (Scrabble, Sudoku, crossword)

Yes	76	63.3
No	44	36.7

List making

Yes	101	84.2
No	19	15.8

Reading (books, magazines, newspapers)

Yes	117	95.7
No	3	2.5

Physical Activity

Table 4.8 summarizes responses to items pertaining to physical activity. In a typical week, during the past 4 weeks, the majority of the sample participated in physical activities such as dancing (50%); walking (67.5%), stretching (78.3%), and housework (98.3%). Few participants engaged in physical activities such as yoga (20%) and bicycling (12.5%). In general, the women were very active and with most engaging in housework activities, stretching and walking. Half of the women gained exercise via dancing while few engaged in activities such as yoga, Tai Chi and bicycling.

Table 4.8. Practices Items –Physical Activity

Physical Activity	Frequency	%
Dancing		
Yes	60	50
No	60	50
Yoga or Tai Chi		
Yes	24	20.0
No	96	80.0
Walking		
Yes	81	67.5
No	39	32.5
Bicycling		

Yes	15	12.5
No	105	87.5
Stretching		
Yes	94	78.3
No	26	21.7
Housework (light, moderate, heavy)		
Yes	118	98.3
No	2	1.7

Social Support Items

Table 4.9 summarizes responses to items pertaining to social support. Most of the sample have help most of the time (32.5%) or all of the time (35%) if they were confined to a bed and needed support. Half (51.7%) have support all of the time if they needed someone to talk to and many (40.8%) have support all of the time if they were in crisis and needed advice. The majority (62.5%) have someone to show them love and affection all of the time and almost half (49.2%) have support available all of time when they need information to help them understand a situation. Half of the sample (50%) have support available all of the time when they need someone to share private worries and fears with. Thus, access to support is available to most of the women across the social support domains.

Table 4.9. Social Support

Social Support	Frequency	%
Support if confined to a bed		
None of the time	2	1.7
A little of the time	13	10.8
Some of the time	24	20.0
Most of the time	39	32.5
All of the time	42	35.0
Support when you need to talk		
None of the time	7	5.8
A little of the time	7	5.8
Some of the time	44	36.7
All of the time	62	51.7
Support when you need advice in a crisis		
None of the time	1	0.8
A little of the time	7	5.8
Some of the time	18	15.0
Most of the time	45	37.5

All of the time	49	40.8
Support to show you love and affection		
A little of the time	5	4.2
Some of the time	8	6.7
Most of the time	32	26.7
All of the time	75	62.5
Support when you need information		
A little of the time	5	4.2
Some of the time	18	15.0
Most of the time	38	31.7
All of the time	59	49.2
Support when you need to share private worries and fears		
None of the time	1	0.8
A little of the time	9	7.5
Some of the time	17	14.2
Most of the time	33	27.5
All of the time	60	50.0

Health Literacy Items

Table 4.10 summarizes responses to items pertaining to health literacy. The majority (68.3%) did not require help any of time with reading written material from their doctor or pharmacy or experience problems learning about their health due to difficulty understanding written material. Over twenty percent reported no confidence in accessing health related information via the Internet (21.7%), almost one fourth reported confidence most of the time (24.2%) and 29.2% reported confidence all of the time. The majority (62.5%) were confident completing medical history and insurance forms without assistance. Thus, health literacy is high however, accessing information via the Internet is a challenge for some of the women.

Table 4.10. Health Literacy Items

Health Literacy	Frequency	%
Help with reading material from your doctor or pharmacy		
None of the time	82	68.3
A little of the time	19	15.8
Some of the time	14	11.7
Most of the time	3	2.5
All of the time	2	1.7
Problems learning about your health due to difficulty understanding written material		
None of the time	82	68.3

A little of the time	18	15.4
Some of the time	17	14.2
Most of the time	3	2.5
Confidence accessing health information via the Internet		
None of the time	26	21.7
A little of the time	11	9.2
Some of the time	19	15.8
Most of the time	29	24.2
All of the time	35	29.2
Confidence completing medical history and insurance forms alone		
None of the time	2	1.7
A little of the time	9	7.5
Some of the time	10	8.3
Most of the time	24	20.0
All of the time	75	62.5

Independent samples t-tests were conducted to compare those interviewed in person versus those interviewed by phone. I examined differences in sociodemographic characteristics, knowledge, attitudes and practices and subjective cognitive health. There were no significant differences between the groups, thus the method of administering the interview did not bias respondents' answers.

Table 4.11 summarizes responses to the qualitative question "Is there anything else that you would like to tell me about your own knowledge, attitudes and practices related to maintaining your cognitive health?" One-third of the sample responded and five key themes emerged. Consistent with recent studies, the women indicated that both regular physical activity and social support are important aspects of their focus on aging well and maintaining their cognitive health. Several mentioned that it is also important to have accurate information on current trends in cognitive health and recommended approaches to lifestyle changes and activities designed to support and promote better cognitive health. When asked why access to information is a factor in maintaining their cognitive health, they indicated that sometimes, information in the media can be confusing to understand because of the over reliance on technical language. Furthermore, information can be conflicting depending on the source, which makes it difficult to know what to

believe and trust as reliable and valid. The importance of keeping a healthy outlook and staying positive through prayer and daily affirmations were also common themes. While some women mentioned a fear of getting AD someday, most cited concerns due to family history with AD or with risk factors associated with AD such as diabetes and hypertension. Despite these concerns, all the women indicated that through prayer, support, and incorporating healthy habits into their daily routines, they are to maintain good cognitive health.

Table 4.11 Summary of responses to Q64

Themes related to maintaining Cognitive Health	Frequency
Fear of AD and concern about cognitive decline	8
Importance of factual knowledge about AD	23
Importance of regular physical and mental activity, diet and nutrition	9
Importance of Social Support	11
Importance of faith and spirituality	10

Chapter 5 summarizes regression analyses of models predicting SES on KAP and regression analyses of KAP and SES models predicting subjective cognitive health.

CHAPTER 5: MULTIVARIATE ANALYSES

This chapter describes the regression analyses conducted to test the research hypotheses.

Research Hypotheses:

H1. SES as measured by education and income is positively related to knowledge about

cognitive decline.

H2. SES as measured by education and income is positively related to higher scores on the

attitudes scale regarding the importance and ability to maintain cognitive health.

H3. SES as measured by education and income is positively related to practices associated

with maintaining cognitive health.

H4. The effects of SES as measured by education and income on subjective cognitive health

is impacted by knowledge, attitudes, and practices.

Table 5.1 summarizes regression analyses for hypotheses 1-3. These models controlled for age and marital status.

In Model 1, the Protective Knowledge Subscale was regressed against the SES measures to predict knowledge about protective factors for AD. Model 1 is a significant equation (F = 2.812, p=.029) and explains 5.9% of the variance in knowledge about protective factors for AD. Age is negative and significant (p=.021). The negative relationship suggests that older women are less likely to have knowledge about protective behaviors for AD, while younger women are more likely to know about behaviors that can protect one from AD. None of the other variables are statistically significant.

In Model 2, the Concern and Susceptibility Knowledge Subscale was regressed against SES measures to predict concern and susceptibility to AD. Model 2 is not a significant equation (F=1.819, NS) and there are no significant predictors.

In Model 3, the Attitudes Scale was regressed against the SES measures to predict attitudes about maintaining cognitive health. Model 3 is a significant equation (F= 2.557, p=.043) and explains 5.1% of the variance in attitudes about cognitive health. Age is negative and significant (p=.008). The negative relationship suggests that older women score lower on the attitude scale about the importance of cognitive health and their ability to maintain their cognitive health as they age. None of the other variables are statistically significant.

In Model 4, the Healthy Eating Practices Subscale was regressed against the SES measures to predict healthy eating habits. Model 4 is not a significant equation (F=1.112, NS) and there are no significant predictors.

In Model 5, the Barriers to Eating Practices Subscale was regressed against SES measures to predict eating barriers. Model 5 is a significant equation (F= 3.017, p=.021) and explains 6.6% of the variance in barriers to eating. Income is negative and significant (p=.022). The negative relationship suggests that lower income is associated with greater barriers to healthy eating. None of the other predictors are significant.

In Model 6, the Sleep Problems Practices Subscale was regressed against the SES measures to predict sleep problems. Model 6 is not a significant equation (F=.536, NS) and there are no significant predictors.

In Model 7, the Brain Count Practices Subscale was regressed against the SES measures to predict participation in brain training exercises. Model 7 is a significant equation (F=7.320, p=.000) and explains 18% of the variance in participation in brain training exercises. Both income (p=.002) and marital status (p=.021) are significant predictors. Education was marginally significant (p=.069). This suggests that individuals with more income and those who are not

married and more likely to do brain exercises. In addition, there is a tendency among those who are more educated to participate in brain training exercises.

In Model 8, the Physical Activity Practices Subscale was regressed against the SES measures to predict participation in physical activity. Model 8 is a significant equation (F= 4.782, p=.001) and explains 11.6% of the variance in participation in physical activity. Age is negative and significant (p=.024); marital status is negative and significant (p=.021), and income is marginally significant (p=.070). The negative relationships suggest that older women and married women participate in fewer physical activities. Income is positively related and suggests that women with higher incomes have a tendency to participate in more physical activities due to greater access to resources.

Models 1-8 examined whether sociodemographic factors predicted knowledge, attitudes, and practice. SES variables predicted several outcomes. Income was significant in three outcomes from the practices subscales; eating barriers, brain exercises, and marginally predictive of physical activity. This finding suggests that low income women are more likely to encounter circumstances, due to lack of resources, which prevent them from engaging in healthy eating behaviors. Access to monetary resources is also related to participation in brain training exercises and physical activity and suggests that higher SES women are better financially situated and to engage in practices associated with maintaining their cognitive health. Education was marginally significant for doing brain exercises. This relationship is positive and suggests that highly educated women had more knowledge about practices associated with maintaining cognitive health and were perhaps more financially situated to engage in protective practices.

Age was significant in three outcomes: knowledge of protective factors for AD, attitudes about cognitive health, and physical activity. For the knowledge subscale, age is negative and suggests

that older women are less likely to have knowledge about protective behaviors for AD. A possible explanation for this finding is that older women within the sample may have lower education levels compared to the younger women in the sample, and therefore have limited access to resources pertaining to knowledge about cognitive health. This finding is consistent with other studies pertaining to cognitive health knowledge about risk and protective factors (Roberts et al., 2014; Park et al., 2012).

For the attitudes scale on the importance of and ability to maintain cognitive health, age was negative and suggests that older women scored lower on the scale. A possible explanation for this finding is that older women in the sample may have felt less opportunity for them to change their cognitive health and may also view any decline as associated with normal aging.

For the physical activity subscale, age was negative and suggests that older women were less likely to participate in regular physical activity. A possible explanation for this finding is that older women may have multiple constraints (health challenges, time constraints, financial limitations) which prevent them from participating in regular physical activity.

Marital status was significant in two outcomes from the practices subscales; brain exercises and physical activity. Marital status was negative in both models and suggests that married women were less likely to participate in behaviors which promote cognitive health. A possible explanation for this finding is that the married women within the sample have less time available to engage in brain training exercises and physical due to time constraints such as caregiving for their spouses or other family members.

For the outcomes of knowledge concern, healthy eating, and sleep problems, none of the sociodemographic variables were significant. A possible explanation for this finding is that knowledge about protective factors for AD attenuates concerns about susceptibility to AD. Also

knowledge about practices associated with promoting cognitive health may not influence engaging in practices such as healthy eating and sleep habits. A final explanation is that the scales may not have been sensitive enough to assess these domains and therefore did not produce enough variance in the data to find significant.

Table 5.1 Summary of Regression Analysis of Socioeconomic Status (SES) on Knowledge, Attitudes, and Practices (KAP) (N=120)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Knowledge - AD Protective Factors	Knowledge - AD Concern and Susceptibility	Attitudes	Practices Healthy Eating	Practices Barriers to Eating	Practices Sleep Problems	Practices Brain Exercises	Practices Physical Activity
Income	-.030 (.043)	.099 (.143)	-.024 (.036)	-.120 (.082)	-.128* (.055)	-.091 (.18)	.515** (.165)	.231 (.127)
Education	-.036 (.035)	-.025 (.117)	.037 (.029)	-.028 (.067)	-.031 (.045)	.006 (.097)	.247 (.135)	.155 (.104)
Age	-.014* (.005)	-.023 (.018)	-.012** (.004)	-.004 (.010)	-.004 (.007)	-.016 (.015)	-.013 (.021)	-.036* (.016)
Marital Status	-.074 (.085)	.450 (.286)	.022 (.071)	.133 (.165)	.066 (.110)	.137 (.235)	-.772* (.330)	-.593* (.253)
Constant	2.876	2.850	2.562	3.267	2.285	3.102	5.206	4.533
Adjusted R2	.059	.028	.051	.004	.066	-.016	.180	.116
F	2.812*	1.819	2.557*	1.112	3.017*	.536	7.320***	4.782**

Notes: Alzheimer's disease is abbreviated as AD. *p<.05, **p<.01 and ***p<.001. Data are given as unstandardized regression coefficients. Standard Errors appear in parentheses.

Table 5.2 summarizes the regression analyses conducted to predict subjective cognitive health. All models controlled for age and marital status.

In Model 1, the subjective cognitive health measure was regressed against the SES measures to predict the impact of SES on subjective cognitive health. Model 1 is not a significant equation (F=1.496, NS) and the sociodemographic factors are not predictors of subjective cognitive health.

In Model 2, the subjective cognitive health measure was regressed against the SES measures and knowledge scales (protective and concern) to predict the impact of SES and knowledge on subjective cognitive health. Model 2 is a significant model (F=2.734, p=.016) explaining 8.3% of the variation in subjective cognitive health. The "concern" subscale is negative and significant (p=.002). The negative relationship suggests that individuals with less concern about cognitive health rate themselves as having better subjective cognitive health.

In Model 3, the subjective cognitive health measure was regressed against the SES measures and the attitudes scale to predict the impact of SES and attitudes on subjective cognitive health. Model 3 is not a significant equation (F=1.376, NS) and the sociodemographic factors are not predictors of subjective cognitive health.

In Model 4, the subjective cognitive health measure was regressed against the SES measures and practices scales (healthy eating, eating barriers, sleep problems, brain count and physical count) to predict the impact of SES and practices on subjective cognitive health. Model 4 is not a significant equation (F=1.781, NS). The "healthy eating" subscale is positive and marginally significant (p=.069) which suggests that women who reported healthy eating habits also reported better subjective cognitive health.

In Model 5, the subjective cognitive health measure was regressed against SES and the knowledge, attitudes, and practices scales and subscales to predict the impact of SES and KAP on

subjective cognitive health. Model 5 is a significant equation (F=2.296, p=.012) and explains 11.9% of the variation in subjective cognitive health. Significant predictors of subjective cognitive health were the "concern" subscale (p=.004) and the "healthy eating" subscale (p=.042). The "concern" subscale was negative and significant which suggests that individuals with less concern about maintaining their cognitive health as they age reported a higher level of subjective cognitive health. The "healthy eating" subscale was positive and significant which suggests that individuals with better eating habits reported better subjective cognitive health. The "physical activity" subscale was positive and marginally significant (p=.083). This suggests that individuals who engage in regular physical activity reported better subjective cognitive health.

In Model 6, one of the knowledge subscales (protective factors) and three of the practices subscales (eating barriers, sleep problems, and brain exercises) that were not significantly related to subjective cognitive health were excluded. The subjective cognitive health measure was regressed against the SES measures and the knowledge "concern" subscale; the attitudes scale, and practices subscales "healthy eating" and "physical activity" to predict the impact on subjective cognitive health. Model 6 is a significant equation (F=3.132, p=.003) and explains 12.9% of the variation in subjective cognitive health. Significant predictors of subjective cognitive health were the "concern" subscale (p=.003), the "healthy eating" subscale (.032), and the "physical activity" subscale (p=.034). Results for the "concern" subscale, the "healthy eating" subscale and the "physical activity" subscale were similar to Model 5. The "concern" subscale was negative and significant which suggests that individuals with less concern about maintaining their cognitive health as they age reported a higher level of subjective cognitive health. The "healthy eating" subscale was positive and significant which suggests that individuals with better eating habits reported better subjective cognitive health. The "physical activity" subscale was positive and

significant which suggests that individuals who engage in regular physical activity reported better subjective cognitive health.

Models 1-6 examined whether sociodemographic factors, knowledge, attitudes, and practices measures and SES measures predicted subjective cognitive health. SES measures and sociodemographic factors were not significant in any of the models. For the knowledge scale, the "concern" subscale was negative and significant which suggests that better subjective cognitive health is associated with less concern about and susceptibility to AD. For the attitudes scale, there were no significant findings. For the practices scale, the "healthy eating" subscale was positive and significant which suggests that healthy eating habits are associated with a self-perception of better subjective cognitive health. Further tests to predict subjective cognitive health based on SES and KAP measures produced similar results and finding suggests that within the sample, low concern about and susceptibility to AD and healthy eating habits are associated with better subjective cognitive health.

Additional models were conducted to predict subjective cognitive health using the SES measures, KAP scales and subscales, the health literacy subscales and the social support scales. None of the health literacy measures or social support measures were significant.

Chapter 6 summarizes findings; identifies strengths and weaknesses of the present study; policy implications and directions for future research.

Table 5.2 Summary of Regression Analysis of Socioeconomic status (SES) and Knowledge, Attitudes and Practices (KAP) on Subjective Cognitive Health (SCH) (N=120)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	SES and SCH	Knowledge Scales and SCH	Attitude Scale and SCH	Practices Scales and SCH	Full Model for SCH	Reduced Model for SCH
Income	.098 (.093)	.119 (.090)	.093 (.093)	.075 (.097)	.100 (.095)	.104 (.090)
Education	.088 (.076)	.066 (.074)	.097 (.077)	.074 (.076)	.084 (.075)	.075 (.073)
Age	.005 (.012)	.002 (.012)	.003 (.012)	.008 (.012)	.005 (.012)	.005 (.012)
Marital Status	-.227 (.186)	-.138 (.182)	-.222 (.186)	-.163 (.189)	-.071 (.185)	-.085 (.181)
Protective Factors for AD		.070 (.199)			.151 (.205)	
Concern and Susceptibility for AD		-.187** (.059)			-.175** (.059)	-.180** (.059)
Attitudes			-.234 (.247)		-.201 (.250)	-.204 (.237)
Healthy Eating				.198 (.108)	.215* (.105)	.226 * (.104)
Eating Barriers				-.078 (.169)	-.025 (.167)	
Sleep Problems				-.118 (.078)	-.110 (.076)	
Brain Exercises				-.004 (.055)	-.005 (.054)	
Physical Activity				.123 (.075)	.130 (.074)	.146* (.068)
Constant	2.286	2.617	2.886	1.647	1.998	1.922
Adjusted R^2	.017	.083	.016	.058	.119	.129
F	1.496	2.734*	1.376	1.781	2.296*	3.132**

Notes: Alzheimer's disease is abbreviated as AD. Subjective Cognitive Health is abbreviated as SCH $*p<.05$, $**p<.01$ and $***p<.001$. Data are given as unstandardized regression coefficients. Standard errors are shown in parentheses.

CHAPTER 6: DISCUSSION AND CONCLUSION

This chapter summarizes findings and offers insights regarding each finding. This study was cross-sectional, and included quantitative data on knowledge about cognitive decline, attitudes about cognitive decline and practices associated with maintaining cognitive health among a sample of older African American women. Based on the Fundamental Causes Theory, the KAP model was used to explore the impact of SES as a predictor of subjective cognitive health. The specific aims of the study were to:

1. Examine the relationship between SES as measured by education and income, and factual knowledge about cognitive decline, AD in particular.

2. Examine the relationship between SES as measured by education and income, and attitudes about the importance of cognitive health and the ability to maintain cognitive health.

3. Examine the relationship between SES as measured by education and income, and participation in practices associated with maintaining cognitive health such as diet and nutrition; physical activity, brain training exercise, and sleep habits.

4. Explore the effect of SES as measured by education and income on knowledge, attitudes, and practices associated with cognitive health as predictors of subjective cognitive health (SCH).

Following is an overview of the study sample; summary of results from the KAP measures, and results of analyses of KAP and SES models predicting subjective cognitive health. Next, I present the study's strengths and limitations, directions for research and policy implications.

Study Sample

A total of 120 African American women 65 years and older from the metropolitan Detroit area participated in the study. The typical respondent was 73 years old; not married, lived

independently, was well educated and had an annual income of less than $40,000.00. Responses to questions on self-reported health status and self-reported memory indicate that, in general, participants were in good health and had cognitive function consistent with the normal process of aging.

Summary of findings from KAP measures

No studies have used the KAP Model to examine subjective cognitive health, particularly among older African Americans. The KAP measures were included to assess factual knowledge about cognitive decline, AD in particular; attitudes about the importance and maintenance of cognitive health, and engagement in practices associated with maintaining cognitive health. According to the CDC (2011) and existing studies (Friedman et al, 2009; Laditka et al., 2009; Matthews et al., 2009; Wilcox et al., 2009; Wu et al., 2009) health behaviors such as diet and nutrition, physical and brain training exercise, and sleep help maintain cognitive health and mitigate cognitive decline.

Knowledge Measures

Knowledge measures assessed concern and susceptibility to AD and knowledge about protective and risk factors for AD. Regarding concern and susceptibility to AD, findings indicate that although the majority of respondents wanted to know their chances of someday getting AD, most strongly disagreed that they believe they will get AD someday and worry about getting AD someday.

Attitude Measures

Attitude measures assessed the importance and maintenance of cognitive health. Most respondents indicated that maintaining their cognitive health is important and that there are things that they can do to maintain their cognitive health. While the majority of respondents expressed

worry about their cognitive health as they age, most somewhat disagreed or strongly disagreed with the statement that that they worry about getting AD someday. A possible explanation for this inconsistency is that the measures pertaining to concern and susceptibility to AD and attitudes about maintain cognitive health were not sensitive enough to accurately explicate responses. A second explanation is that respondents may not have been aware of the relationship between cognitive health and AD. Specifically, they may not have had prior understanding of how AD is classified and that it one domain within the cognitive health spectrum.

Practices Measures

Practices measures assessed engagement in health behaviors linked to maintaining cognitive health and preventing cognitive decline.

Diet and nutrition habits

The typical respondent reported having a good or very good appetite and eating healthy meals at least twice a day. More than three-quarters strongly agreed that they had enough money to buy the food they needed and had no physiologic or functional barriers which prevented them from eating. Most reported that their weight had not changed during the past six months. Of those reporting weight changes, it is unclear as to what factors may have contributed to a change in weight.

Sleep habits

The typical respondent reported good or very good sleep during the data collection period. Although the majority reported waking during the night, sleep difficulties were not a limitation.

Brain exercises

Respondents most frequently engaged in watching educational programs on television, driving, doing routine financial work, list making, and reading as forms of regular cognitive activity.

Physical activity

In general, the sample was very active and respondents most frequently engaged in light, moderate or heavy housework; stretching, and walking as forms of regular physical activity**.**

Summary of findings from analyses of SES and KAP models

In multiple regression models that controlled for age and marital status, results explicated the relationships between SES and KAP as predictors of SCH.

The first aim of the study was to determine whether SES predicts the KAP measures. The knowledge measures included two subscales; concern and susceptibility for AD and knowledge about risk and protective factors for AD. When examining the relationship between SES and concern and susceptibility, results yielded no significant impact of SES. When examining the relationship between SES and knowledge about protective and risk factors for AD, results indicate that age is significant and negative. The negative relationship suggests that younger women within the sample are more likely to know about health behavior associated with maintaining cognitive health and preventing cognitive decline. A possible explanation for this finding is that the younger women had access to better educational opportunities which is directly related to income level. Consequently, younger women may have greater access to health education resources and also have greater health literacy compared to older women.

The second aim of the study was to determine whether SES predicts scores on the attitudes scale about the importance and maintenance of cognitive health. When examining this

relationship, results indicate that age is significant and negative. The negative relationship suggests that older women scored lower on the scale measuring the importance and maintenance of cognitive health. A possible explanation for this finding is that older women may not be aware of factual knowledge about cognitive health or the recent scientific developments regarding healthy practices associated with maintaining cognitive health throughout the life span.

The third aim of the study was to determine whether SES predicts engagement in practices associated with maintaining cognitive health and preventing cognitive decline.

Diet and Nutrition

The diet and nutrition measures included two subscales: healthy eating and barriers to eating. When examining the relationship between SES and the healthy eating subscale, results yielded no significance. When examining the relationship between SES and eating barriers, income is negative and significant. The negative relationship indicates that low income women have more barriers to engaging in healthy eating behaviors. A possible explanation for this finding is that poor women have fewer economic resources to purchase healthy food. This is an interesting finding given that 94.7% of the sample either strongly agreed or agreed with the statement affirming that they had enough money to buy the foods they need.

Sleep Habits

When examining the relationship between SES and sleep habits, results yielded no significance.

Activity

The activity measures included two subscales; brain training exercise and physical activity. When examining the relationship between SES and brain training exercises, income and marital status are significant predictors. Education was marginally significant. These findings

suggest that high income women and those who are not married are more likely to participate in activities designed to promote cognitive health. Highly educated women have a tendency to do brain training exercises. When examining the relationship between SES and physical activity, higher income women are marginally more likely to be active. In addition, age and marital status are negative and significant. Older women and married women are less likely to engage in physical activities designed to promote cognitive health. A possible explanation is older women and married women may have less available time to participate in physical activities due to time constraints such as caregiving for their spouses or other family members. A possible explanation for the marginally significant finding for income is that high income women are more likely to participate in physical activities due to greater financial resources providing access to a variety of activities.

Summary of findings from analyses of SES and KAP predicting subjective cognitive health

The final aim of the study was to determine the effect of SES predicting SCH and SES and KAP predicting SCH.

Subjective Cognitive Health (SCH)

SES and SCH

When examining whether SES predicts SCH, the results yielded no significance. A possible explanation for this finding is that there was only one measure of cognitive health in the questionnaire and it could be that additional questions may have yielded significant results.

SES and individual KAP measures predicting SCH

Knowledge measures

When examining whether SES and knowledge predict SCH, the "concern and susceptibility for AD' subscale is negative and significant. This finding suggests that women with less concern about susceptibility to AD rate themselves as having better cognitive health.

Attitudes measure

When examining whether SES and attitudes about the importance and maintenance of cognitive health predict SCH, results yielded no significance. A possible explanation is the measures was not sensitive enough to capture responses about attitudes pertaining to the importance and maintenance of cognitive health.

Practices measures

When examining whether SES and practices associated with maintaining cognitive health predict SCH, the "healthy eating" subscale was only marginally significant. This finding suggests that women who reported healthy eating habits had a tendency to rate themselves as having better cognitive health.

SES and combined KAP measures predicting SCH

When examining the effects of SES and all of KAP measures on SCH, the "concern and susceptibility" subscale; the healthy eating" subscale, and the "physical subscale" were significant. These finding suggests that women who reported healthy eating habits; engagement in regular physical activity, and less concern about maintaining their cognitive health as they age also reported better subjective cognitive health. Higher income women had a tendency to report better SCH.

Strengths of the Study

Confidence in findings from the study are supported for several reasons. First, few studies have examined what knowledge, attitudes and practices African Americans have regarding

maintaining cognitive health and preventing cognitive decline. Even fewer have explored the impact of SES on these domains to determine intra group differences. Building on the Fundamental Causes Theory, the present study analyzed the role of SES on cognitive health outcomes and also illustrated the significance of the KAP Model in examining these relationships. Second, the present study included a larger number of African Americans than previous studies. Prior studies (Barnes et al., 2011) demonstrate the importance of sample size in research on SES and health disparities. Lastly, the present study is cross-sectional and includes data collected using validated scales rather than focus-group data. This strengthens the reliability of findings and also increases generalizability, which can potentially inform the development of targeted inventions designed specifically for African Americans.

Study Limitations

Although the study yielded findings which shed light on what African Americans know about cognitive health; how they feel about cognitive decline, and what specific practices they associate with maintaining their cognitive health, there are several limitations to the present study. While the sample size (n=120) included a larger number of African Americans compared to other studies, it was small and did not allow for a more rigorous examination of intra group differences relevant to knowledge, attitudes, and practices associated with maintaining cognitive health and preventing cognitive decline. In addition, the inclusion of women only further limited the power of testing intra group differences and potential generalization to the larger population. Thirdly, the use of one measure of subjective cognitive health may have impacted findings. Although the cognitive health is widely used and was adapted from a validated scale, there may be additional indicators of cognitive health that may have yielded different relationships between SES and the KAP measures. Furthermore, the results are based on self-reported data and due to response-bias,

it is possible that this may have influenced patterns in responses. Finally, the results could be due to selection effects in the sample. Although the PRP is representative of older African American adults in the metropolitan Detroit area, members tend to have higher education levels compared to most Detroit residents. It is possible that the advantages associated with higher education levels may have limited the power to test intra group differences between social classes.

Directions for Future Research

The present study sheds light on cognitive health among African Americans and the effects of SES on subjective cognitive health. Contrary to my original hypotheses, findings suggest that age, marital status, healthy eating and concern and susceptibility to AD are significant predictors of subjective cognitive health rather than education or income. Findings indicate that older individuals have less factual knowledge about risk and protective factors for AD, which places them are greater risk for cognitive decline. Future research should explore these findings and work to develop interventions which target the oldest of the old to increase awareness about cognitive health. Using models other than KAP, future studies should explore how the oldest of the old view cognitive health and the barriers to knowledge and other resources that may exist which prevent them from engaging in health behaviors that help to maintain cognitive function. In addition, married individuals were less likely to participate in health behaviors which have the potential to reduce the risk of cognitive impairment. Future research should examine the role of marital status on cognitive health. While research on the effects of caregiving for the elderly suggests a link between depression and caregiving, more attention needs to be given to exploring other potential health consequences which includes risk factors for cognitive impairment. Finally, future research should replicate this study using a larger, more diverse sample size which includes

men, and additional cognitive health measures to better understand the impact of SES on cognitive health.

Policy Implications

Findings from the present study have several policy implications. Most significantly, findings suggest the continuing need for research on African Americans and cognitive health. As the cumulative risk for cognitive impairment and AD among African Americans increases, understanding how African Americans view cognitive health, identifying gaps in knowledge and understanding predictors of unhealthy behaviors will help to reduce rates of cognitive impairment in the future. Another implication is the need for culturally relevant interventions which are sensitive to intra group diversity that exists among African Americans. The findings that the oldest of the old had less positive attitudes about their ability to maintain their cognitive health suggests a cohort effect such that the oldest of the old may be more restricted in their access to resource. Lastly, increased funding for community based initiatives designed to promote and encourage healthy behaviors is essential to reducing current disparities in rates of cognitive impairment.

Given that the risk of cognitive impairment is higher among older African Americans, there is an urgent need to shed light on the mechanisms that correlate to poor health outcomes such as inadequate schooling, poor health care, and lack of awareness about protective behaviors. Described as an "emerging public health crisis" in the African American community, the overall impact of rates of cognitive impairment will be felt for generations to come. It has never been more urgent for both the scientific and lay communities to work together to make cognitive aging research a national priority.

APPENDIX A

Behavioral Research Informed
Consent

Title of Study: Cognitive Health and African American Elders: Attitudes, Knowledge and Behavior

Principal Investigator (PI):   Shelytia Cocroft
                                         Department of Sociology, Wayne State University
                                         (312) 504-6996
                                         (direct)
                                         (313) 577-2297 (message only)

Funding Source: National Institute of Health Supplemental Diversity Grant of the Michigan Center of
Urban African American Aging Research (MCUAAAR)

Purpose

You are being asked to be in a research study to better understand what knowledge, attitudes and behaviors are important in maintaining brain health because you are an African American elder aged
65 and older. This study is being conducted at Wayne State University. The estimated number of study participants to be enrolled at Wayne State University is about 120. **Please read this form and ask any questions you may have before agreeing to be in the study.**

In this research study, we are examining the degree to which beliefs about cognitive health and function influences attitudes and behaviors of older African Americans in attempting to prevent the onset of cognitive decline or to control any decline already occurring. This study results will shed light on knowledge, attitudes, and practices related to maintaining cognitive health among African American elders.

Study Procedures

If you agree to take part in this research study, you will be asked to meet the interviewer at Wayne State University's Institute of Gerontology (lOG) for one 45-60-minute visit. The interviewer will review the consent form in detail and the participant will be told that participation is voluntary before asking the participant to sign the form. The interviewer will ask survey questions about your knowledge about Alzheimer's disease; attitudes about maintaining cognitive health, and behaviors (exercise, diet, sleep etc.) associated with maintaining cognitive health. Examples of the survey questions are: How much do you agree with this statement: "There are things that I can do to help maintain my cognitive health as I age" and "During the past month, how would you rate your sleep quality?" Coded identifiers will be used to report participant's identity. This means that each participant will be assigned an ID code so that your name will not appear on the data (the interview) that we collect from

you. Consent forms with the participant's ID number and signature will be stored in a locked cabinet at the lOG. The data (paper survey) will only have the participant's ID number (no name) and will be stored in a different locked cabinet at the lOG. Only Peter Lichtenberg and Shelytia Cocroft will have access to the consent forms (with ID number and signature) and the data (paper surveys).

Submission/Revision Date:
3/4115
Protocol Version #: 3

_____
Participant's Initials
HIC Date: 08-11

Benefits

As a participant in this research study, there are no direct benefits. This study results will shed light on knowledge, attitudes, and practices related to maintain cognitive health among African American elders.

Risks

There are no known risks at this time to participation in this study however, if the participant reports that they are the victim of elder abuse it will be reported to Adult Protective Services.

Study Costs

Participation in this study will be of no costs to you.

Compensation

For taking part in this research study, you will receive a $25.00 CVS gift card for your time and inconvenience.

Confidentiality

All information collected about you during the course of this study will be kept confidential to the extent permitted by law. You will be identified in the research records by a code name or number. Information that identifies you personally will not be released without your written permission. However, the study sponsor, the Institutional Review Board (IRB) at Wayne State University, or federal agencies with appropriate regulatory oversight [e.g., Food and Drug Administration (FDA), Office for Human Research Protections (OHRP), Office of Civil Rights (OCR), etc.) may review your records.

When the results of this research are published or discussed in conferences, no information will be included that would reveal your identity.

Voluntary Participation/Withdrawal

Taking part in this study is voluntary. You have the right to choose not to take part in this study. If you decide to take part in the study you can later change your mind and withdraw from the study. You are free to only answer questions that you want to answer. You are free to withdraw from participation in this study at any time. Your decisions will not change any present or future relationship with Wayne State University or its affiliates, or other services you are entitled to receive.

The PI may stop your participation in this study without your consent. The PI will make the decision and let you know if it is not possible for you to continue. The decision that is made is to protect your health and safety, or because you did not follow the instructions to take part in the study.

Page 2 of 3

_____
Participant's Initials
HIC Date:
08-11

The PI may stop your participation in this study without your consent. The PI will make the decision and let you know if it is not possible for you to continue. The decision that I made is to protect your health and safety, or because you did not follow the instructions to take part in the study.

Questions

If you have any questions about this study now or in the future, you may contact Shelytia Cocroft or one of her research team members at the following phone number (312) 504-6996 or at the WSU Institute of Gerontology (313) 577-2297. If you have questions or concerns about your rights as a research participant, the Chair of the Institutional Review Board can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Consent to Participate in a Research Study

To voluntarily agree to take part in this study, you must sign on the line below. If you choose to take part in this study you may withdraw at any time. You are not giving up any of your legal rights by signing this form. Your signature below indicates that you have read, or had read to you, this entire consent form, including the risks and benefits, and have had all of your questions answered. You will be given a copy of this consent form.

_____   _____
Signature of participant   Date

_____   _____
Printed name of   Time
participant

_____   _____
Signature of person obtaining consent   Date

_____   _____
Printed name of person obtaining consent   Time

APPROVAL PERIOD

MAR 1 0 '15   AUG 2 0 '15

WAYNE STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Submission/Revision Date: 3/4/1
Protocol Version #3
Initials

Page 3 of 3

_____
_____Participant's

HIC 08-11

_____

Cognitive Health and African American Elders

Behavioral Research Oral Consent Script

Title of Study: Cognitive Health and African American Elders: Attitudes, Knowledge and Behavior

Principal Investigator (PI):   Shelytia Cocroft
                                 Department of Sociology, Wayne State University
                                 (312) 504-6996 (direct)
                                 (313) 577-2297 (message only)

Funding Source: National Institute of Health Supplemental Diversity Grant of the Michigan Center of Urban African American Aging Research (MCUAAAR)

Pre-Interview Introduction, Confidentiality and Oral Consent

Hello, my name is_____ and I'm calling from Wayne State University's Healthier Black Elders Center. We are interviewing our Participant Resource Pool members to learn more about their knowledge of Alzheimer's disease and attitudes and behaviors about maintaining cognitive health. The survey will last 45-60 minutes and can be done in one or two phone calls divided up. You will be sent a $25.00 CVS gift certificate upon completion of the interview.

The interview is completely confidential and voluntary. If you would like, we can mail you a brochure describing our project in more detail. If we come to a question that you are not comfortable answering, please let me know and I'll move on to the next question. Also, you should know that you are free to withdraw your participation at any point during the interview. You are free to withdraw from participation in this study at any time. Your decisions will not change any present or future relationship with Wayne State University or its affiliates, or other services you are entitled to receive.

As a participant in this research study, there are no direct benefits. This study results will shed light on knowledge, attitudes, and practices related to maintain cognitive health among African American elders.

There are no known risks at this time to participation in this study however, if you report that you are the victim of elder abuse it will be reported to Adult Protective Services.

If you have any questions regarding your rights as a participant in this interview or in the future, you may contact Peter Lichtenberg, the director of the Institute of Gerontology, at 313/577-2297 or

the Wayne State University Human Investigation Committee (the office responsible for ethical research on campus) at 313/577-1628. Would you like to participate in our study? Is now a good time?

APPROVAL PERIOD

MAR 1 0 '15   AUG 2 0 '15

WAYNE STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Wayne State University Institute of Gerontology is seeking participants for

The Cognitive Health and African American Elders Study: Attitudes, Knowledge, and Behavior

To qualify, you must be:
- a woman
- age 65 or older
- African American

Maintaining a healthy brain is important to successful aging. We are looking for older African American adults who can help us understand what knowledge, attitudes and behaviors are important in maintaining brain health. We will not ask you any detailed information about your health. All of your information will be kept completely confidential.

Participants will be required to attend 1 session for about 1 hour:

- Answer survey questions about knowledge, attitudes, and practices associated with cognitive health.
- Examples of questions are:
  - How much do you agree with this statement: "There are things that I can do to help maintain my cognitive health as I age."
  - "During the past month, how would you rate your health compared to others your age-excellent, very good, good, fair, or poor?"
  - "In a typical week do you do light work, such as sweeping or vacuuming?"
- Interview to be conducted at WSU or a location convenient to you (e.g., senior center) or by telephone.
- You will be compensated for your time.

If interested, please contact:

Shelytia Cocroft, PhD Candidate Sociology
Wayne State University Institute of Gerontology
87 E. Ferry St., Detroit, MI 48202
(312) 504-6996 (direct); (313) 577-2297 (message only)

APPROVAL PERIOD

MAR 1 0 '15   AUG 2 0 '15

WAYNE STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

APPENDIX B

Instrument for the Cognitive Health and African Americans Study

ID#_____

Interviewer:_____

Date Completed:_____

Demographic Information

1. How old were you on your last birthday?

_____

2. Which best describes your living situation?

☐ Independent community dweller (Are you living in your own apartment or home?)
☐ Assisted living
☐ Living with family/relatives

3. Which best describes you?

☐ Single (never married)
☐ Married, or living as married
☐ Separated, but not divorced
☐ Divorced
☐ Widowed

4. What is the highest level of education you have completed?

☐ Never attended school
☐ Only attended kindergarten
☐ Grades 1 through 8 (Elementary)
☐ Grades 9 through 11 (Some High School)
☐ Grade 12 or GED (High School graduate)
☐ College 1 year to 3 years (Some college or technical school)
☐ College 4 years (College graduate)
☐ Post Bachelor graduate degree

5. Are you currently:

☐ Employed for wages
☐ Self-employed
☐ Retired
☐ A student
☐ Disabled
☐ Unemployed
☐ Homemaker

6. What is your current or past occupation?

_____

7. What was your total household income (including social security benefits) last year?

☐ Less than $20,000
☐ $20,000-$39,000
☐ $40,000-$64,000
☐ $65,000-$99,000
☐ $100,000 or over

8. How would you rate your health compared to others your age?

☐ Excellent
☐ Very Good
☐ Good
☐ Fair
☐ Poor

Question 9 pertains to depression (Adapted from the PHQ-2)

9. Over the past 2 weeks, how often have you been bothered by any of the following problems?

(a) Little interest or pleasure in doing things

☐ Not at all
☐ Several days
☐ More than half the days
☐ Nearly everyday

(b) Feeling down, depressed or hopeless

    ☐ Not at all
    ☐ Several days
    ☐ More than half the days
    ☐ Nearly everyday

10. How would you rate your memory?

    ☐ Excellent
    ☐ Very Good
    ☐ Good
    ☐ Fair
    ☐ Poor

Questions 11-13 pertain to perceived cognitive impairment (Michigan Dementia Coalition, Lichtenberg et al., 2007)

11. Are your memory, thinking skills, or ability to reason worse than a year ago?

(If Yes, go to Q12. If No, go to Q13)

☐ Yes   ☐ No

12. If yes, has it interfered with your everyday activities (e.g. shopping, paying bills, driving)

☐ Yes   ☐ No

13. Has a physician or other health care professional evaluated your memory or thinking?

☐ Yes   ☐ No

Questions 14 – 27 pertain to diet and nutrition (SCREEN, H.H. Keller, 1999)

14. How many foods do you limit or avoid because of a health condition or because they disagree with you?

    ☐ None
    ☐ One or two
    ☐ Quite a few
    ☐ Enough to make it hard to eat with others
    ☐ Enough to make your diet very restricted

15. How often do you usually eat?

    ☐ At least three times each day
    ☐ At least three times a day, five or six days a week
    ☐ At least three times a day, three to four days a week
    ☐ Two times a day
    ☐ Less than two times a day
    ☐ Do not know

16. How many times a day do you eat fruits or vegetables (canned, fresh, frozen, or juice)?

    ☐ Five or more times a day
    ☐ Four or more times a day
    ☐ Three or more times a day
    ☐ Two or more times a day
    ☐ Less than two times a day
    ☐ Do not know

17. How many times do you eat meat, eggs, fish, poultry or meat alternatives (such as dried peas, beans, lentils, nuts, or tofu)?

    ☐ Two or more times each day
    ☐ Once each day
    ☐ Five or six times a week
    ☐ Three or four times a week
    ☐ Less than three times a day
    ☐ Do not know

18. How many cups (250ml or 8 oz.) of fluid do you drink each day (tea, coffee, water, juice, milk or soft drinks)?

- ⬜ Five or more
- ⬜ Four
- ⬜ Three
- ⬜ Two
- ⬜ Less than two
- ⬜ Do not know

19. How often do you find it hard to bite or chew food?

- ⬜ Never
- ⬜ Rarely
- ⬜ Sometimes
- ⬜ Often
- ⬜ Always

20. How often do you choke, cough or have pain when you swallow food or fluids?

- ⬜ Never
- ⬜ Rarely
- ⬜ Sometimes
- ⬜ Often
- ⬜ Always

21. When you eat alone, how often do you eat good, healthy meals?

- ⬜ Never
- ⬜ Rarely
- ⬜ Sometimes
- ⬜ Often
- ⬜ Always
- ⬜ I rarely eat alone

22. How often do you take meal replacements or drink supplements like Boost or Ensure?

  ☐ Never
  ☐ Rarely
  ☐ Sometimes
  ☐ Often
  ☐ Always

23. Is your appetite usually….

  ☐ Very good
  ☐ Good
  ☐ Fair
  ☐ Poor
  ☐ Very poor

24. Do you agree with the following statement? "I have enough money to buy the food I need".

  ☐ Strongly agree
  ☐ Agree
  ☐ Don't agree or disagree
  ☐ Strongly disagree

25. If you do your own cooking, how often do you find it difficult (physically, lack interest, stressful, lack skill)?

  ☐ Never
  ☐ Rarely
  ☐ Sometimes
  ☐ Often
  ☐ Always
  ☐ Does not do own cooking

26. If you do your own grocery shopping, how often do you find it difficult (physically, lack transportation, poor weather, lack of interest or stressful)?

- Never
- Rarely
- Sometimes
- Often
- Always
- Does not do own shopping

27. Has your weight changed in the past 6 months?

- Lost
- Gained
- Weight has not changed
- Does not know if weight has changed

(a) How much has your weight changed?
- More than 10 pounds
- 6-10 pounds
- 2-5 pounds
- Less than 2 pounds

Knowledge

Questions 28- 38 pertain to knowledge (adapted from Roberts et al., Public Beliefs and knowledge about Risk and Protective Factors for Alzheimer's disease, 2014)

Questions 28-30 assess concern about and susceptibility to Alzheimer's disease

28. Do you agree with the following statement? "I would like to know my chances of someday getting Alzheimer's disease? "

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

29. Do you agree with the following statement? "I believe I will get Alzheimer's disease someday?

    ☐ Strongly agree
    ☐ Somewhat agree
    ☐ Neither agree nor disagree
    ☐ Somewhat disagree
    ☐ Strongly disagree

30. Do you agree with the following statement? "I worry about getting Alzheimer's disease? "

    ☐ Strongly agree
    ☐ Somewhat agree
    ☐ Neither agree nor disagree
    ☐ Somewhat disagree
    ☐ Strongly disagree

Questions 31-38 assess knowledge and beliefs about risk and protective factors for Alzheimer's disease

31. Prescription drugs that prevent Alzheimer's disease are available.

☐ True   ☐ False

32. Having a parent with Alzheimer's disease increases the chances of developing it.

☐True   ☐ False

33. How important is stress in increasing a person's chance of getting Alzheimer's disease? Is it:

    ☐ Very important
    ☐ Somewhat important
    ☐ Not at all important

34. How important are genetics in increasing a person's chance of getting Alzheimer's disease? Is it:

    ☐ Very important
    ☐ Somewhat important
    ☐ Not at all important

35. Keeping physically active is important in lowering a person's chance of getting Alzheimer's disease? Is it:

- Very important
- Somewhat important
- Not at all important

36. Keeping mentally active is important in lowering a person's chance of getting Alzheimer's disease? Is it:

- Very important
- Somewhat important
- Not at all important

37. Eating a healthy diet is important in lowering a person's chance of getting Alzheimer's disease? Is it:

- Very important
- Somewhat important
- Not at all important

38. Taking vitamins or dietary supplements is important in lowering a person's chance of getting Alzheimer's disease? Is it:

- Very important
- Somewhat important
- Not at all important

Attitudes

Questions 39-41 pertain to attitudes about cognitive health

39. Do you agree with the following statement? Maintaining my cognitive health is important to me as I age.

- I agree
- I somewhat agree
- I do not agree

40. Do you agree with the following statement? There are things that I can do to help maintain my cognitive health as I age.

- I agree
- I somewhat agree
- I do not agree

41. Do you agree with the following statement? I am concerned about my cognitive health as I age.

    ☐ I agree
    ☐ I somewhat agree
    ☐ I do not agree

Practices

Questions 42- 52 pertain to practices (physical activity and sleep habits)

42. Which best describes you?

    ☐ I am very socially active.
    ☐ I am somewhat socially active.
    ☐ I am not very socially active.

Questions 43- 44 pertain to physical activity/brain exercises (PA/BE)

43. In a typical week, during the past 4 weeks, did you participate in any of the following activities?

    ☐ Watching TV (Games shows, education programs) ☐Yes ☐No
      If yes, how many times per week ___
    ☐ Listening to the radio (News programs, sports)   ☐Yes ☐No
      If yes, how many times per week ___
    ☐ Preparing meals from recipes   ☐Yes ☐No
      If yes, how many times per week ___
    ☐ Playing cards, chess, bride or knowledge games ☐Yes ☐No
      If yes, how many times per week ___
    ☐ Playing board games of skill or chance   ☐Yes ☐No
      If yes, how many times per week ___
    ☐ Taking a course (arts and crafts, writing, computer)☐Yes ☐No
      If yes, how many times per week ___
    ☐ Doing routine financial work (paying bills, checking bank accounts) ☐Yes   ☐No
      If yes, how many times per week ___
    ☐ Driving ☐Yes   ☐No **If yes, how many times per week ___**
    ☐ Puzzles (Scrabble, Sudoku, crossword puzzles) ☐Yes ☐No **If yes, how many times per week _**
    ☐ List making   ☐Yes ☐No **If yes, how many times per week __**
    ☐ Reading (books, magazines, newspaper) ☐Yes ☐No **If yes, how many times per week __**
    ☐ Dancing   ☐Yes ☐No **If yes, how many times per week __**
    ☐ Yoga/Tai Chi   ☐Yes ☐No **If yes, how many times per week __**

☐ Walking	☐Yes ☐No	**If yes, how many times per week __**
☐ Bicycling	☐Yes ☐No	**If yes, how many times per week __**
☐ Stretching	☐Yes ☐No	**If yes, how many times per week __**
☐ Housework	☐Yes ☐No	**If yes, how many times per week __**

44. In a typical week, during the past 4 weeks, did you do other types of physical activities not previously mentioned? Please specify.

☐Yes   ☐No   **If yes, what activity _____ How many times a week _____**

Questions 45-52 pertain to sleep habits (adapted from the Pittsburgh Sleep Study)

45. During the past month, when have you usually gone to bed?

Usual bed time _____

46. During the past month, how long (in minutes) does it usually take you to fall asleep?

Number of minutes _____

47. During the past month, when have you usually gotten up in the morning?

Usual getting up time _____

48. During the past month , how many hours of actual sleep did you get at night? (This may be diferent than the number of hours that you spend in bed)

Hours of sleep per night _____

49. For each of the remaining questions, please choose the best answer.

(a) Do you wake up in the middle of the night or early morning?

☐ Not during the past month
☐ Less than once a week
☐ Once or twice a week
☐ Three or more times a week
☐ Not sure

(b) Do you have problems breathing, snoring, or coughing at night?

- ☐ Not during the past month
- ☐ Less than once a week
- ☐ Once or twice a week
- ☐ Three or more times a week
- ☐ Not sure

(c) Are there other reasons you have trouble sleeping? **(If No, go to Q50)**

Please describe _____

How often during the past month have you had trouble sleeping because of this?

- ☐ Not during the past month
- ☐ Less than once a week
- ☐ Once or twice a week
- ☐ Three or more times a week
- ☐ Not sure

50. During the past month, how would you rate your sleep quality overall?

- ☐ Very good
- ☐ Fairly good
- ☐ Fairly bad
- ☐ Very bad
- ☐ Not sure

51. During the past month, how often have you taken medicine (prescription or "over the counter") to help you sleep?

- ☐ Not during the past month
- ☐ Less than once a week
- ☐ Once or twice a week
- ☐ Three or more times a week
- ☐ Not sure

52. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

      ☐ Not during the past month
      ☐ Less than once a week
      ☐ Once or twice a week
      ☐ Three or more times a week
      ☐ Not sure

Social Support
Questions 53 – 59 pertain to social support (adapted from the MOS)

53. About how many close friends and close relatives do you have (people you feel at ease can talk to about what is on your mind)? _____.

People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?

54. Someone to help you if you were confined to bed
      ☐ 1 – None of the time
      ☐ 2 – A little of the time
      ☐ 3 – Some of the time
      ☐ 4 – Most of the time
      ☐ 5 – All of the time

55. Someone you can count on to listen to you when you need to talk

      ☐ 1 – None of the time
      ☐ 2 – A little of the time
      ☐ 3 – Some of the time
      ☐ 4 – Most of the time
      ☐ 5 – All of the time

56. Someone to give you good advice about a crisis

      ☐ 1 – None of the time
      ☐ 2 – A little of the time
      ☐ 3 – Some of the time
      ☐ 4 – Most of the time
      ☐ 5 – All of the time

57. Someone who shows you love and affection

    ☐ 1 – None of the time
    ☐ 2 – A little of the time
    ☐ 3 – Some of the time
    ☐ 4 – Most of the time
    ☐ 5 – All of the time

58. Someone to give you information to help you understand a situation

    ☐ 1 – None of the time
    ☐ 2 – A little of the time
    ☐ 3 – Some of the time
    ☐ 4 – Most of the time
    ☐ 5 – All of the time

59. Someone to share your most private worries and fears with

    ☐ 1 – None of the time
    ☐ 2 – A little of the time
    ☐ 3 – Some of the time
    ☐ 4 – Most of the time
    ☐ 5 – All of the time

Health Literacy
Questions 60- 63 pertain to health literacy (Chew at al., 2007)

60. How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy?

    ☐ 1 – None of the time
    ☐ 2 – A little of the time
    ☐ 3 – Some of the time
    ☐ 4 – Most of the time
    ☐ 5 – All of the time

61. How often do you have problems learning about your health because of difficulty understanding written information?

        ☐ 1 – None of the time
        ☐ 2 – A little of the time
        ☐ 3 – Some of the time
        ☐ 4 – Most of the time
        ☐ 5 – All of the time

62. How confident are you accessing health related information via the Internet?
        ☐ 1 – None of the time
        ☐ 2 – A little of the time
        ☐ 3 – Some of the time
        ☐ 4 – Most of the time
        ☐ 5 – All of the time

63. How confident are you filling out medical history and insurance forms by yourself?

        ☐ 1 – None of the time
        ☐ 2 – A little of the time
        ☐ 3 – Some of the time
        ☐ 4 – Most of the time
        ☐ 5 – All of the time

64. Is there anything else you would like to tell me about your knowledge, attitudes, and practices related to maintaining your cognitive health?

APPROVAL PERIOD

MAR 1 0 '15   AUG 2 0 '15

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ABSTRACT

**COGNITIVE HEALTH AND AFRICAN AMERICAN ELDERS STUDY:
KNOWLEDGE, ATTITUDES AND PRACTICES**

by

SHELYTIA COCROFT

August 2016

Advisor: Dr. Janet Hankin

Major: Sociology

Degree: Doctor of Philosophy

A substantial body of literature suggests that cognitive impairment disproportionately affects African Americans. To date, research has uncovered disturbing racial disparities associated with the prevalence of cognitive impairment and dementia and found prevalence rates of Alzheimer's disease (AD) to be higher among African Americans (Potter et al., 2009). Furthermore, a 2002 report from the Alzheimer's Association described AD in the African American community as an "emerging public health crisis". This dissertation examined the impact of socioeconomic status (SES) on knowledge, attitudes, and practices (KAP) associated with the promotion of cognitive health among a sample of 120 African American women aged 65 and older. Knowledge pertains to knowledge about AD risk and protective factors, and concern and susceptibility to AD. Attitudes pertain to attitudes about the importance and ability to maintain cognitive health. Practices pertain to engagement in physical activities and brain training exercises linked to optimal cognitive health. Based on the Theory of Fundamental Causes, the study postulated a positive relationship between SES, as measured by education level and income, and

KAP on subjective cognitive health. Specifically, the study hypothesized that high SES individuals will have greater knowledge about cognitive decline, more positive attitudes about maintaining their cognitive health, and will be more likely to participate in activities that promote cognitive health relative to low SES individuals. The KAP domains were measured using existing validated scales adapted for the study. Factor analyses were conducted to create KAP scales and subscales. Regression analyses were conducted and all models controlled for age and marital status. Models for SES and KAP indicated that: (1) age is negatively associated with knowledge about protective and risk factors for AD, (2) age is negatively associated with attitudes about cognitive decline, (3) income is negatively associated with barriers to healthy eating, (4) age and income were predictive of engagement in physical activity and (5) marital status and education were predictive of engagement in brain training exercise. While SES was not a significant predictor in the models for SES, KAP and subjective cognitive health, findings indicate that concern and susceptibility to AD; healthy eating practices, and physical activity are predictors of subjective cognitive health.

AUTOBIOGRAPHICAL STATEMENT

Shelytia Cocroft holds a M.A. in Sociology from DePaul University in Chicago, Illinois and a B.A. in Education from the University of Illinois at Chicago, Illinois. She is a former faculty member at Malcolm X College in Chicago, where she taught undergraduate sociology courses to include: Introduction of the Social Sciences, Introduction to Sociology, and Marriage and Family. She is a Michigan Center for Urban African American Aging Research (MCUAAAR) Diversity Scholar and her dissertation research was supported by a two year National Institutes of Health (NIH) Diversity Scholarship from the University of Michigan (2014-2016). She was awarded three MCUAAAR Summer Training Fellowships (2011, 2015, and 2016); the Thomas C. Rumble Fellowship from Wayne State University in 2012, and the King, Park, Chavez (KCP) Fellowship from Wayne State University in 2009. Her professional affiliations include Sociologists Without Borders, the Association of Black Sociologists, Alpha Kappa Delta Honor Society, Phi Kappa Phi Honor Society, Phi Theta Kappa Honor Society, and Golden Key National Honor Society.