Running head: DEMENTIA AND ALZHEIMER'S

Dementia and Alzheimer's Among Older Americans:

Research Lessons for Cognitive Functioning Study in Nigeria

Katrina A. Korb, PhD

University of Jos

University of Jos

PO Box 10402

Jos, Plateau State

katrina.korb@gmail.com

Dementia and Alzheimer's Among Older Americans: Research Lessons for Cognitive Functioning Study in Nigeria

Abstract

Alzheimer's disease and dementia represent two of the most cognitive functioning disorders in the aged population of the United States, both having severe negative consequences on a person's daily functioning. This paper first describes the two diseases and then reviews empirical literature on environmental factors that reduce the risk of developing the cognitive diseases. Finally, a research agenda is proposed to determine the environmental factors that are most closely related to reducing the impact of dementia and Alzheimer's in the Nigerian population. This research agenda will influence theoretical models of the dementia and Alzheimer's diseases as well as directing the practice of educators and counselors of the aged population.

Dementia and Alzheimer's Among Older Americans: Research Lessons for Cognitive Functioning Study in Nigeria

In the next 40 years, the average life expectancy of West Africans is expected to increase from 51 to 69 years of age (United Nations, 2002), effectively doubling the percentage of the population over the age of 60. As the population of Nigeria increases in age, the number of adults who suffer from cognitive functioning disorders such as dementia and Alzheimer's will also increase. Even though the incident rate for cognitive functioning disorders appears to be lower in developing countries (Hendrie, Ogunniyi, Hall, Baiyewu, Unverzagt, Gureje, et al., 2001), the number of people with dementia in Africa is expected to increase by 235% in the next 40 years (Ferri, Prince, Brayne, Brodaty, Fratiglioni, Ganguli, et al., 2005). Furthermore, the lack of formal healthcare support for those suffering from cognitive functioning disorders in developing countries substantially increases the burden of care on family members (Prince, 1997).

The goals for this paper are threefold. First, I will describe two common cognitive functioning disorders found in older American adults: dementia and Alzheimer's disease. Second, I will review the American research literature on the environmental factors that reduce the risk of dementia and Alzheimer's disease in the aged. Based on this literature, I will conclude by proposing a research agenda aimed to reduce the impact of cognitive functioning disorders in Nigerians.

Dementia and Alzheimer's Disease

To illustrate the effects of dementia and Alzheimer's disease, I will describe two case studies. John, age 91, was diagnosed with dementia four years ago. John first showed evidence of dementia when he forgot how to bathe and began dressing inappropriately by wearing little clothing even when the temperature was 0° Celsius. He would also wander into his neighbor's apartments uninvited (an act not culturally accepted in the United States).

Despite being a devout Christian, he became physically aggressive and made rude comments. Because of his behavior, John was placed in the psychiatric ward of the hospital and eventually moved to a nursing home that could monitor his behavior more effectively.

According to the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR;* American Psychiatric Association, 2000), dementia is characterized by multiple cognitive deficits. A clinical diagnosis of dementia is made when a person displays at least two symptoms. First, all dementia patients have a memory impairment, which tends to be the earliest symptom (*DSM-IV-TR*, 2000). More specifically, they will be unable to remember newly learned material, forget previously learned material, or perhaps both. People with dementia may lose valuables, forget about food they were cooking, or become lost in unfamiliar neighborhoods. Memory loss can become so severe that they forget their occupation, family members, and even their name. In addition to memory impairment, a diagnosis of dementia requires at least one of the following conditions: aphasia, apraxia, agnosia, or lack of executive functioning. (*DSM-IV-TR*, 2000). Aphasia is characterized by the loss of language functioning, such as being unable to understand spoken language or make comprehensible speech. Apraxia consists of an impaired ability to execute motor activities such as being unable to cook or dress. Agnosia is the failure to recognize common objects despite having adequate vision. For example, people with agnosia may be unable to recognize a chair or their family members. Finally, a disturbance in executive functioning is characterized by being unable to think abstractly or to plan and initiate a complex behavior. This is manifest by having difficulty with new tasks or being unable to plan activities. All of these cognitive deficits must represent a decline in functioning and be sufficiently severe as to impair occupational or social functioning. Dementia will inhibit working, shopping, dressing, bathing, handling finances, and other activities of daily living.

A number of factors can contribute to the onset of dementia, including Alzheimer's disease, head trauma, the HIV virus, substance abuse, vitamin deficiencies, and various other medical conditions (*DSM-IV-TR*, 2000). The two most common forms of dementia are Alzheimer's disease and vascular dementia. Approximately 16% to 25% of the American population over the age of 85 years have symptoms of dementia.

In a classic demonstration of Alzheimer's disease, Jane, aged 89 years old, cried because she broke her doll and was fearful that her father, a deceased alcoholic, would beat her as punishment. Jane was finally pacified when she retrieved a new doll to replace the old. In general, Jane was unable to recognize the people who came to visit her in the nursing home, including her children. She spent most of her time in the past, manifest by reliving the beatings that she received from her father as a child. Her first symptoms of Alzheimer's included forgetting to eat meals because she could not keep track of time and getting lost while walking around the neighborhood, prompting a police search for her. Jane's symptoms became progressively worse until she died five years after being diagnosed with Alzheimer's.

Approximately 13% of Americans age 85 years have Alzheimer's, followed by 23% at age 90 years and 38% at age 95 years (*DSM-IV-TR*, 2000). As Alzheimer's progresses, memory impairments become more severe and the disease is eventually fatal (Alzheimer's Association, 2007). The average duration of Alzheimer's from the onset of symptoms until death is 8 to 10 years. The disease destroys brain cells, resulting in memory problems that disrupt thinking, working, hobbies, and social life. People with Alzheimer's show personality changes and increased irritability. Other common symptoms include disorientation to time by forgetting the day, month, or year and disorientation to place by losing track of their location.

To distinguish between Alzheimer's and other forms of dementia, clinicians examine the cause of the disease and its progression. Vascular dementia is caused by reduced blood flow to specific parts of the brain (Alzheimer's Association, 2007). Therefore, people with

vascular dementia can prevent the symptoms from getting worse by actively managing blood pressure and cholesterol as well as treating the underlying heart diseases (Alzheimer's Association, 2007). However, the cause of Alzheimer's disease is not known. Furthermore, Alzheimer's progressively inhibits cognitive functioning and is fatal.

Environmental Factors Associated with Cognitive Functioning Disorders

Even though dementia and Alzheimer's disease are the result of brain dysfunction, a number of environmental factors have been found to reduce a person's risk for these diseases. In a meta-analysis that examined empirical effects accrued over many independent studies, Valenzuela and Sachdev (2006) demonstrated that people with advanced education had 47% fewer cases of dementia than those with a basic education. Adults with higher occupational status, e.g. professor or lawyer, also had a 44% decreased risk of dementia.

In addition to occupation and education, two lifestyle variables have been found to be beneficially related to sound cognitive functioning in older adults. First, participation in complex mental activities strongly influences cognitive functioning later in life (Fratiglioni, Paillard-Borg, & Winblad, 2004; Singh-Manoux, Richards, & Marmot, 2003; Verghese, Lipton, Katz, Hall, Derby, Kuslansky, et al., 2003). Examples of complex mental activities include visiting museums; reading books, magazines, or newspapers; listening to music; playing board games or cards; playing musical instruments; and participating in further schooling. In their meta-analysis, Valenzuela and Sachdev (2006) found that even after controlling for education and occupational status, people who engaged in these mentally stimulating leisure activities had approximately 50% fewer cases of dementia.

Social engagement also reduces the incidence of dementia and Alzheimer's (Fratiglioni et al., 2004; Singh-Manoux et al., 2003). Social engagement can include indoor group games, involvement in voluntary organizations, visiting friends and relatives, and participating in evening educational courses. Older adults living with another individual (e.g.,

spouse) and visit with their children and friends on a weekly basis have a rate of approximately 19 out of 1000 incidences of dementia. On the other hand, older adults who live alone and do not visit their children or have few close, personal ties have about 157 out of 1000 incidences of dementia (Fratiglioni, Wang, Ericsson, Maytan, & Winblad, 2000).

In conclusion, researchers generally acknowledge that participation in complex mental activities is beneficial for maintaining sound cognitive functioning in older adults (Singh-Manoux et al., 2003). Specifically, four factors have been reliably associated with a reduced risk of dementia and Alzheimer's disease in older American adults: high educational attainment, high occupational status, engaging in mentally stimulating leisure activities, and positive social engagement. As the life expectancy increases in Nigeria, the incidence of dementia is also expected to sharply increase (Valenzuela and Sachdev, 2006). Identifying environmental factors that are similarly related to reducing a Nigerian's risk for dementia is essential in order to formulate effective preventative measures. Therefore, the rest of this paper will focus on a research agenda for examining preventative measures for cognitive functioning disorders in older Nigerian adults.

Relationship of Cognitive Functioning Disorders in America and Nigeria

Educational attainment and occupational status have been found to be related to a lower incidence of dementia in American adults. Even though conducting studies to examine the influence of these two variables on dementia and Alzheimer's in a sample of older Nigerians would be relatively simple, I propose that research should instead focus on Nigerians' leisure activities and social engagement for two reasons. First, educational attainment and occupational decisions tend to be made about fifty years before the symptoms of dementia and Alzheimer's develop. While improving education and employment in Nigeria is vital for many reasons in addition to preventing cognitive functioning disorders, maintaining sound cognitive functioning in older Nigerians demands a more immediate

solution in light of the rapidly increasing age of the Nigerian population. In other words, implementing interventions via increased education and occupation would take too long to produce the desired results of keeping the incidence of dementia and Alzheimer's low. Second, enhancing educational and employment opportunities for all Nigerian citizens is a societal problem that has to be addressed at many levels of society. As educational psychologists, we should be determined to improve educational opportunities for all Nigerian children and adults. But when addressing the issue of cognitive functioning disorders in older Nigerian adults, encouraging mentally stimulating leisure activities and social engagement is a more direct course of action.

Whereas complex mental activities have a stronger relationship with reduced incidences dementia in samples of Americans, I hypothesize that social engagement will emerge as a stronger preventative measure with Nigerians because Nigerians place a stronger emphasis on community life and developing close personal bonds. In contrast, Americans tend to be more individualistic and value an autonomous lifestyle (Maranz, 2001). Indeed, many older American adults live in nursing facilities away from their families and friends. Therefore, perhaps the breadth and depth of a Nigerian's social network may have the strongest relationship to cognitive functioning in older adulthood.

I also hypothesize that some of the complex mental leisure activities that are associated with a reduced incidence of dementia in Americans are impractical in Nigerian society. First, there are fewer museums in Nigeria than in America, and most elderly Nigerians in the villages would have not have access to existing museums. Second, many in the current generation of older Nigerians did not have the opportunity to learn how to read or do not have ready access to a library. Finally, American community colleges and local recreation departments offer evening classes in a variety of topics that older Americans can take, but these courses are not similarly widespread in Nigeria.

In contrast, listening to music and playing musical instruments are likely more prevalent in Nigeria than America. Playing board games also seems to be a common leisure activity for Nigerians. Perhaps the latter three activities will demonstrate more robust associations with cognitive functioning in older Nigerians. Tentative research evidence also suggests that being fluent in and frequently using at least two languages throughout adulthood may delay the onset of dementia (Bialystok, Craik, & Freedman, 2007). Given the diversity of languages in Nigeria, number of languages frequently spoken might be an additional factor to investigate in Nigeria, although researchers need to control for educational level when investigating the effects of bilingualism on cognitive functioning.

Whereas some of the factors related to cognitive functioning amongst older Americans will likely transfer to Nigerians, additional related factors will likely be found within the Nigerian population. The following research agenda will enable researchers to determine the uniquely Nigerian factors that are associated with reduced incidences of cognitive functioning disorders; research that is essential to prevent an epidemic of cognitive functioning disorders in the Nigerian population.

Nigerian Research Agenda for Cognitive Functioning Disorders

First, a descriptive study using a semi-structured interview needs to be conducted in a smaller sample of older Nigerians. The sample should include both adults with sound cognitive functioning and adults who demonstrate dementia symptoms as reported by a medical doctor or friends and family. Data should be collected on medical history, educational attainment, and occupational status. Structured questions then should elicit information on the breadth and depth of social network, number of languages spoken and frequency of use, common leisure activities engaged in, and any other potential preventative factors. The purpose of this first step is to get an initial impression of environmental factors that might demonstrate a statistical relationship with cognitive functioning in older Nigerians.

Once sufficient information has been gathered from the interviews, researchers can then make an initial evaluation of the data to select specific environmental factors that appear to be more prevalent in the group of older Nigerians with sound cognitive functioning when compared to those with dementia. Based on this information, the second research study should be a causal-comparative study that will determine whether the hypothesized factors statistically differ between older Nigerians with sound cognitive functioning and older Nigerians with dementia or Alzheimer's. A questionnaire should be developed based on the semi-structured interview data to assess the frequency of the selected behaviors both in the past and present. For example, a question can assess whether the Nigerian visits relatives daily, two or three times a week, weekly, monthly, or yearly.

After piloting the questionnaire to determine its adequacy, the questionnaire should then be administered to a similarly composed sample (both older adults with good cognitive functioning and older adults with symptoms of dementia) but significantly larger. This larger sample will enable the researchers to conduct statistical tests to confirm whether any of the environmental behaviors are significantly related to better cognitive functioning in old age.

The most powerful method of determining whether an actual cause and effect relationship exists between any of the environmental factors and cognitive functioning is to conduct a true experiment (Gall, Gall, & Borg, 2003). While this longitudinal experimental method will be the most powerful and convincing evidence to that the factors cause improved cognitive functioning in Nigerians, it will also take the most planning, effort, and time. The results of the questionnaire study should then be used to develop one or multiple treatments that will be administered to Nigerian adults before they demonstrate symptoms of dementia. For example, if visiting with friends on a daily basis is found to be positively related to cognitive functioning, then participants in one experimental condition will be taught about the importance of social relationships, trained in methods of positive social engagement, and

even provided with a group of other adults with whom to regularly socialize. Participants should be randomly assigned to either an experimental group that receives the cognition intervention or to a control group that does not receive the intervention. Every few years, participants in both the experimental and control groups should receive mental health check-ups to determine their level of cognitive functioning. If a true causal relationship exists between the posited factors and cognitive functioning, then participants in the experimental condition will have a lower incidence rate of dementia and Alzheimer's disease than in the control group in subsequent years.

In conclusion, I have proposed a research agenda for finding the uniquely Nigerian environmental factors that are associated with cognitive functioning in older adults. Results of these studies will have both practical and theoretical implications. Practically, results of these studies will indicate interventions that counselors can use with older Nigerians to prevent dementia and Alzheimer's disease. Furthermore, the results of these studies will have practical implications in the world at large. Because Nigerians honor and respect their elders, I believe that Americans have much to learn from Nigerians about caring for older adults. Therefore, results of these studies can inform other countries about methods of preventing cognitive functioning disorders. Theoretically, comparison of the American and Nigerian correlates of cognitive functioning in older adults will contribute to a deeper understanding of the causes of these two diseases. In conclusion, the results from these studies will be informative both in order to prevent cognitive functioning disorders as the life expectancy for Nigerians increases as well as to demonstrate to other countries, including America, how to most effectively care for their aging population.

References

Alzheimer's Association. (2007). *What is Alzheimer's?* Retrieved October 4, 2007, from http://www.alz.org/alzheimers_disease_what_is_alzheimers.asp

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed. text revision). Washington, DC: Author.

Bialystok, E., Craik, F. I. M., & Freedman, M. (2007). Bilingualism as a protection against the onset of symptoms of dementia. *Neuropsychologia, 45,* 459-464.

Ferri, C. P., Prince, M., Brayne, C., Brodaty, H., Fratiglioni, L., Ganguli, M., et al. (2005). Global prevalence of dementia: A Delphi consensus study. *Lancet, 366,* 2112-2117.

Fratiglioni, L., Paillard-Borg, S., & Winblad, B. (2004). An active and socially integrated lifestyle in late life might protect against dementia. *Lancet Neurology, 3,* 343-353.

Fratiglioni, L., Wang, H.-X., Ericsson, K., Maytan, M., & Winblad, B. (2000). Influence of social network on occurrence of dementia: A community-based longitudinal study. *Lancet, 355,* 1315-1319.

Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational Research: An introduction.* Boston: Pearson Education, Inc.

Hendrie, H. C., Ogunniyi, A., Hall, K. S., Baiyewu, O., Unverzagt, F. W., Gureje, O., et al. (2001). Incidence of dementia and Alzheimer disease in 2 communities: Yoruba residing in Ibadan, Nigeria, and African Americans residing in Indianapolis, Indiana. *Journal of American Medical Association, 285,* 739-747.

Maranz, D. E. (2001). *African friends and money matters: Observations from Africa.* Dallas, TX: SIL International and International Museum of Cultures.

Prince, M. (1997). The need for research on dementia in developing countries. *Tropical Medicine and International Health, 2,* 993-1000.

Singh-Manoux, A., Richards, M., & Marmot, M. (2003). Leisure activities and cognitive function in middle age: Evidence from the Whitehall II study. *Journal of Epidemiology and Community Health, 57,* 907-913.

United Nations. (2002). *World Population Aging 1950-2050.* Retrieved 16 April 2008, from http://www.un.org/esa/population/publications/worldageing19502050/index.htm

Valenzuela, M. J., & Sachdev, P. (2006). Brain reserve and dementia: A systematic review. *Psychological Medicine, 36,* 441-454.

Verghese, J., Lipton, R. B., Katz, M. J., Hall, C. B., Derby, C. A., Kuslansky, G., et al. (2003). Leisure activities and the risk of dementia in the elderly. *New England Journal of Medicine, 348,* 2508-2516.