

# INVESTIGATION OF RACIAL DISPARITIES IN RATES OF ALZHEIMER'S DISEASE AMONG AFRICAN AMERICANS AS COMPARED TO WHITE AMERICANS

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## **Introduction**

Dementia is a syndrome involving significant cognitive decline that interferes with a person's ability to function independently (Gale et al., 2018). Alzheimer's disease is one of the most common forms of dementia, affecting 5.5 million adults 65 and older living in the U.S. (Oh & Rabins, 2019). Alzheimer's disease is of particular concern for African Americans, who are twice as likely to develop the disease compared to non-Hispanic White Americans (Kunkle et al., 2021). This paper investigates the factors that have led to higher rates of Alzheimer's disease among African Americans than among White Americans. Comparisons between African Americans and groups currently residing in Africa are also included in an effort to illuminate which factors most contributed to observed disparities. Relevant research also includes an analysis of the genetic risk factors related to dementia and how these genetic markers differ between African Americans and other ethnic groups. The review of the literature suggests that the disparities in rates of dementia among African Americans when compared to other ethnic groups are a result of genetic pathways related to specific genetic loci (Kunkle et al., 2021), environmental factors and the effects of racism as part of life in industrialized societies (Hendrie et al., 2001), and structural inequalities such as a lack of access to quality education (Barnes & Bennett, 2014).

Disparities in rates of Alzheimer's disease highlight the impact that race can have on individuals and their health outcomes and demonstrate why meaningful structural changes are needed to improve health outcomes and address the racism present within our healthcare systems. Understanding how risk factors for Alzheimer's disease can differ across racial and ethnic groups also allows doctors to better assess whether an individual is at risk for developing Alzheimer's disease in their lifetime. Through a medical anthropology framework, this paper offers a holistic perspective that addresses the genetic, environmental, and social components of dementia risk factors.

## **Background**

Risk factors for Alzheimer's disease can differ between racial groups (Barnes & Bennett, 2014). Disparities also exist regarding how Alzheimer's disease manifests in African American patients, who typically display a slower decline and longer survival rate (Barnes & Bennett, 2014). There are also differences in cognitive test performance for African Americans that make it difficult to define the onset of Alzheimer's disease, highlighting the importance of evaluating patients based on changes in their own cognitive ability over time (Barnes & Bennett, 2014). Additionally, African Americans generally have a higher prevalence of vascular dementia but a lower prevalence of Parkinsonian dementia (Miles et al., 2001). This research indicates that the rate at which different groups experience Alzheimer's disease is not the only aspect that varies based on race and suggests that different assessments of Alzheimer's disease risks and preventative methods might be necessary for individuals of different backgrounds. Furthermore, limited access to resources can make it difficult to compare rates of diagnosis because these rates fail to include individuals who do not have

access to healthcare. Current healthcare practices surrounding Alzheimer's disease are also insufficient because they do not properly address the variety of ways that Alzheimer's disease can manifest differently in diverse patients based on their background (Miles et al., 2001).

One of the limitations for researchers is that there is not a sufficient existing sample size of genomic research on African Americans relating to Alzheimer's disease risk, emphasizing the need for further studies and genomic investigations of these populations (Kunkle et al., 2021). Another complication stems from the lack of widespread recognition of the relationship between racism and health. Understanding of these issues is still limited, but research has begun to reveal how race becomes embodied in biological health outcomes (Gravlee, 2009). Although race is not a valid means of biologically categorizing individuals, it is a valid sociocultural category that impacts health and becomes embodied within biology through the experience of race and racism within the U.S. (Gravlee, 2009).

### **Genetic risk factors**

The role of genetics in this risk evaluation is important because the genetic markers that have been associated with increased risk of developing Alzheimer's disease appear to differ between racial groups (Green et al., 2002). Previous studies have identified a relationship between specific genetic loci identified through genomic testing and an increased risk of developing late-onset Alzheimer's disease (Hohman et al., 2016). Genetic variants related to the risk of developing Alzheimer's disease in White American populations also applied to risk for African Americans, but differed in the risk associated with specific genetic loci; among cases of late-onset Alzheimer's disease, there were higher levels of African ancestry both globally and at several specific genetic loci associated with late-onset Alzheimer's disease (Hohman et al., 2016). These local genetic differences are one of the most promising explanations of why rates of late-onset Alzheimer's disease among African Americans are higher than among White Americans.

Another risk factor for Alzheimer's disease that differs between racial groups is shown in the link between triggering receptors expressed on myeloid cells 2, or *TREM2*, coding variants and late-onset Alzheimer's disease among African Americans. Previous studies had established a link between *TREM2* and late-onset Alzheimer's disease in White Americans; however, analyses indicates that although the risk associated with *TREM2* coding variants also existed for African American participants, these variants were found within different regions of the gene than for White Americans (Jin et al., 2015). Researchers are still uncovering what outcome these variations will have on populations, but their work highlights the need for genomic investigation of disease risk variants for members of different racial backgrounds in order to better understand disease risk mechanisms (Jin et al., 2015). Genetics, however, are only one component that contributes to our understanding of overall health. Researchers have begun to investigate how social factors such as exposure to racism can impact biological health outcomes through mechanisms such as epigenetics, as stressful conditions have been shown to alter gene expression and can be passed down to affect subsequent generations (Goosby & Heidbrink, 2013).

### **Social risk factors**

Research has indicated that social inequalities within industrialized societies are a risk factor for Alzheimer's disease among African Americans, specifically (Hendrie et al., 2001). Comparing the rates of dementia and Alzheimer's disease within a Yoruba community in Nigeria and an African American community in Indiana revealed that the annual incident rates of dementia were significantly lower among Yoruba residents compared to African American participants, at 1.35% and 3.24% respectively (Hendrie et al., 2001). This study addresses the potential role of African ancestry as a risk factor for dementia, but its findings suggest that African ancestry is not a

satisfactory explanation for why rates of dementia are higher among African Americans. The difference in rates of dementia between the two groups instead supports the idea that structural inequalities as a result of being a racial minority in America contribute to higher rates of dementia among African Americans. Structural inequalities within America—including a lack of quality education, geographic segregation as a result of historic redlining, and decreased access to healthcare services—are imbedded into the fabric of the nation's institutions. Institutionalized racism within healthcare is known to negatively affect the health of African Americans (Williams, 2012). The effects of racism itself have also been shown to affect cognitive functioning in African American women (Coogan et al., 2020). Racism both as an occurrence in everyday life and as a facet of our institutions was shown to impact measurements of memory, one example of how discrimination can lead to poor long-term cognitive health (Coogan et al., 2020). These results emphasize the potential for structural inequalities and unequal treatment of African Americans to affect long-term cognitive health and have important implications for research on risk factors regarding Alzheimer's disease specifically because of the well documented relationship between increased risk of developing Alzheimer's disease and poor overall cognitive health. Institutionalized and structural inequalities, therefore, seem to explain some of the differences observed in rates of dementia and Alzheimer's disease among African Americans, who disproportionately suffer from the negative effects of racism in America as well as in comparison to other groups of African ancestry globally.

Some risk factors for developing Alzheimer's disease include lower cognitive test performance, higher body mass index, issues such as kidney disease, and social factors such as poor quality of education, all of which are experienced at disproportionately high rates by African Americans (Barnes & Bennett, 2014). The quality of childhood education is also a risk factor because of its link to cognitive development and long-term cognitive health, with poor education being linked to worse cognitive development (Saitadze, 2021). Issues regarding quality of childhood education can be traced through a history of segregation and inequality within U.S. education, with present day reading levels of elderly African Americans continuing to fall below their white peers of the same education level (Manly, 2006). A historic lack of resources allocated to education for African American students appears to be linked to this subsequent decline in cognitive development in childhood. Cognitive development is especially relevant to concerns regarding risk for developing Alzheimer's disease because of the strong link between the two. Financial stress is another factor that African Americans disproportionately struggle with and contributes to the risk of developing Alzheimer's and suffering from poor cognitive functioning later in life. Exposure to the financial stress of growing up during the Great Depression was used as an example to analyze how poverty and financial hardship accurately predicted worse cognitive function later in life (Hale, 2017). This impaired cognitive function subsequently increases the risk of developing Alzheimer's disease as the link between cognitive function and Alzheimer's has previously been well established (Hale, 2017). One issue that researchers have run into when attempting to further investigate this topic is that despite the higher rates of Alzheimer's disease among African Americans, research on Alzheimer's disease patients has been done primarily on White European groups (Kunkle et al., 2021). This highlights another inequality that exists between Whites and African Americans regarding Alzheimer's disease because of the greater wealth of information on genetic and other risk factors for White individuals as a result of more research. Current understandings of Alzheimer's disease risk factors and assessments used to determine these risks are informed by this research, highlighting the disadvantage that African American patients are at because this care is designed using research primarily done on Whites, and risk factors differ significantly between populations.

## Conclusion

Higher rates of Alzheimer's disease among African Americans compared to other ethnic groups can be explained primarily as a result of genetic, structural, and social factors. Efforts to eliminate these disparities need to focus on the differences in how Alzheimer's disease manifests as well as the different risk factors for African Americans. Healthcare professionals focusing on how to better prepare and coach individuals on their risk of developing Alzheimer's disease need to consider individual differences such as race in order to determine which genetic factors will be most important to analyze an individual's risk. As African Americans are more likely to develop Alzheimer's disease, more detailed research is needed to better understand what factors contribute to that higher risk, specifically in reference to genetic differences. The nation's social structures and healthcare systems must be transformed to prevent structural inequalities that impact African Americans and their long-term health. Interventions that might reduce the long-term risk of developing Alzheimer's disease for African Americans include improving the quality of education for communities with a large African American population and social interventions that focus on eliminating poverty for racial minorities. Additionally, efforts to develop more accurate cognitive testing should focus on evaluating individuals based on their own prior cognitive abilities and avoid making comparisons outside of the individual when possible, to avoid bias. Clinicians prescribing treatment plans for Alzheimer's disease should begin to address racial disparities by taking into account the variety of ways that Alzheimer's disease can manifest differently for people of different racial backgrounds. Addressing medical racism is also an important part of attempting to eliminate these disparities. Screening medical professionals for anti-racist attitudes as part of the medical school admissions process is one way that American healthcare systems can begin to address medical racism (Anderson et al., 2020). A potential barrier to effective treatment for African Americans is a lack of trust in physicians (Watkins et al., 2012). Establishing effective treatment for African American patients with Alzheimer's disease will therefore require physicians to gain the trust of patients and caregivers to ensure they can make well-educated decisions, specifically regarding end-of-life care.

**Rachel Younglove** graduated from the University of Florida in the fall of 2021 with a B.A. in anthropology. Rachel hopes that her paper helps to highlight how anthropology's holistic approach can be used to further investigate racial disparities in healthcare.

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