EFFECTS OF HEALTHCARE SYSTEM DISTRUST ON COGNITION IN AFRICAN AMERICAN OLDER ADULTS WITH TYPE TWO DIABETES MELLITUS

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JESSICA L. BERGNER

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EFFECTS OF HEALTHCARE SYSTEM DISTRUST ON COGNITION IN AFRICAN AMERICAN OLDER ADULTS WITH TYPE TWO DIABETES MELLITUS

Jessica Lyn Bergner, Candidate for the Doctor of Philosophy Degree

University of Missouri-Kansas City, 2022

ABSTRACT

Healthcare system distrust has been linked to poorer Type two diabetes management (T2DM) management, but its impact on cognitive functioning in individuals with T2DM has not been assessed. This study aimed to analyze how healthcare system distrust might affect cognitive functioning in African American older adults. To examine the relationship between healthcare system distrust and cognition in African American older adults with T2DM, this study assessed healthcare distrust, diabetes management, psychosocial functioning, and cognitive functioning. Fifty participants aged 60-88 years were recruited from the community. Participants completed a 60-minute telephone battery. It was hypothesized that (1) individual differences in healthcare system distrust would be negatively related to diabetes management, (2) diabetes management was hypothesized to be negatively related to cognitive functioning, (3) healthcare system distrust would be negatively related to cognitive functioning, and (4) a negative relationship between healthcare system distrust and cognitive functioning would be partially mediated by T2DM management. We found that healthcare system distrust may be related to functional cognition in African American older adults with T2DM, and that diabetes management may mediate this relationship.

APPROVAL PAGE

The faculty listed below, appointed by the Dean of the College of Arts and Sciences have examined a dissertation titled “Effects of Healthcare System Distrust on Cognition In African American Older Adults with Type Two Diabetes Mellitus, presented by Jessica L. Bergner, candidate for the Doctor of Philosophy degree.

Supervisory Committee

Joan McDowd, Ph.D.
Department of Psychology

Melisa Rempfer, Ph.D.
Department of Psychology

Kym Bennett, Ph.D.
Department of Psychology

Jake Marszalek, Ph.D.
Department of Psychology

Janette Berkley-Patton, Ph.D.
Department of Biomedical and Health Informatics

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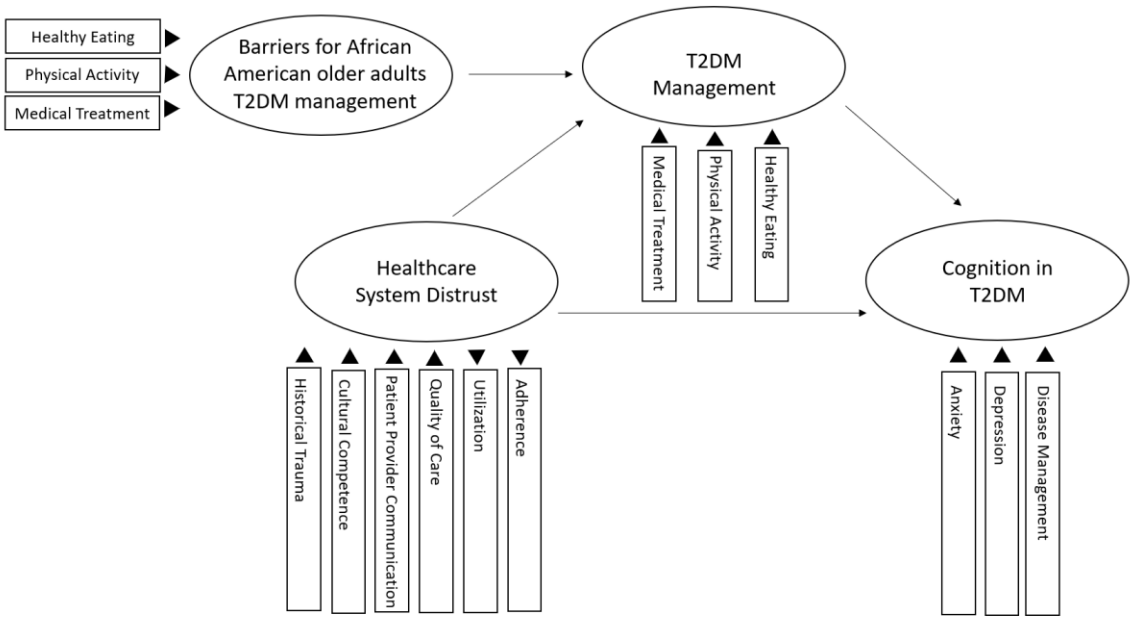
CHAPTER 1

OVERVIEW

African American older adults with type two Diabetes Mellitus (T2DM) are faced with unique discriminatory experiences due to ageism, racism, and ableism. This discrimination has been shown to impact healthcare and has exacerbated a historical distrust of the healthcare system (Kennedy et al., 2007). African American older adults also may hold a distrust for the healthcare system due to negative and discriminatory historical and current experiences. One outcome of this distrust may be that African American older adults receive less than standard treatment. Distrust of healthcare systems may lead African American older adults to underutilize available health services and reduce adherence to treatment (Rose et al., 2004). These important health behaviors often impact disease outcomes, and this is no different for T2DM outcomes (Garber et al., 2019). Findings have consistently shown that positive diabetes management ameliorates negative cognitive and physical impacts of T2DM (Mankovsky et al., 2018; Van Den Berg, 2009).

To date, research examining the impact healthcare system distrust may have on cognition is non-existent. Literature has focused on healthcare system distrust, diabetes management, and cognition in people with T2DM separately, or in pairs, but has not yet connected them in a meaningful way. This gap in the literature has left unknown the impact distrust of the health care system has on the cognition of African American older adults with T2DM. Without understanding the potential relationship between healthcare system distrust and cognition, the chance of successfully addressing the physical, mental, and cognitive health needs of African American older adults with T2DM is greatly reduced. This study aimed to remedy this gap in the literature.

Understanding T2DM in African American older adults requires consideration of four primary constructs: T2DM management behaviors, cognition, barriers to health experienced by African American older adults, and healthcare system distrust. Each of these constructs are themselves affected by a variety of factors that need to be considered to understand the primary constructs and the relation among them. The diagram below depicts the four primary constructs and the factors relevant to those constructs that will be considered in the following review; a subset of these were examined in the study.



CHAPTER 2

REVIEW OF THE LITERATURE

Diabetes and Diabetes Management

T2DM is the type of diabetes that occurs when the pancreas produces insulin, but the body cannot use it effectively; it is more common than type one diabetes mellitus (T1DM), but the cause is still not as fully understood (Diabetic Research Connection, 2016). Risk factors for T2DM include being obese or overweight, hypertension, high cholesterol, and smoking cigarettes (Office of Minority Health, 2020a).

Because the risk factors and treatment of T2DM appear to be controllable via health choices, a T2DM diagnosis carries a significant stigma. One qualitative study conducted by Browne, Ventura, Mosely, and Speight (2014) found that common beliefs surrounding individuals with T2DM are that they are 'lazy', 'fat', and 'unintelligent'. Additionally, individuals with T2DM report often having their character questioned and feeling blamed by society for 'bringing it on themselves'. Diabetes researchers may unknowingly add to this stigma; one study conducted on treatment for T2DM listed the "modifiable" causes of T2DM as body weight, shape, and lifestyle and the "nonmodifiable" causes as age, ethnicity, and genetics (Nyenwe et al., 2011).

T2DM Management Behaviors

The American Association of Clinical Endocrinologists and the American College of Endocrinology suggest that the best treatment for T2DM relies heavily on utilization and adherence to healthcare (Garber et al., 2019). They suggest patients with T2DM be engaged in comprehensive treatment that focuses on minimizing risk for hypoglycemia and weight gain, monitoring of hemoglobin A1C, individualized therapies, medication plans, and

management of health comorbidities. Evidence suggests that healthy eating, physical activity, and medical treatment ameliorate physical and cognitive deficits associated with T2DM (Awad et al., 2004; Nyenwe et al., 2011). Individually these factors work to improve T2DM outcomes.

Healthy Eating. Eating the correct healthy foods can lead to optimal blood glucose concentrations and blood lipid concentrations (Asif, 2014; Center for Disease Control, 2020). A healthy diet can prevent, delay, and treat T2DM (Asif, 2014). An individual at risk for, or diagnosed with, T2DM should reduce carbohydrates and salt, avoid refined sugars and sugar substitutes, reduce red meat, and replace animal fats with polyunsaturated fats (American Diabetes Association, 2007; Lovejoy et al., 1998; Schroder, 2007). Additionally, individuals with T2DM should increase water, fruit, and vegetable intake (American Diabetes Association, 2007; Lindeberg et al., 2007, Sjostrom et al., 2000).

Physical Activity. Increased physical activity is a preventative and management behavior of T2DM (Center for Disease Control, 2020). Aerobic exercises - like walking, jogging, and cycling- increase insulin sensitivity, reduce blood pressure, and increase cardiovascular health (Garber et al., 2011). Aerobic exercise aids in glycol control and reduces fat mass (Dube et al., 2012; Gordon et al., 2009; Kirwan et al., 2009). Additionally, flexibility exercise – like yoga- can reduce mobility issues and may reduce instances of neuropathy caused by T2DM in older adults (Abate et al., 2010; Ahn & Song, 2012).

Medical Treatment. One aspect of T2DM treatment is monitoring and controlling blood glucose and hemoglobin A1C. Monitoring blood glucose and hemoglobin A1C can be an expensive process, but it allows for the detection of asymptomatic hypoglycemia which if untreated can cause cardiac events and long-term clinical complications (Nyenwe et al.,

2013). The first line, and most effective, treatment for controlling glucose levels is insulin therapy (Clement et al., 2004; Moghissi et al., 2009; Nyenwe et al., 2013). However, insulin treatment typically means one to four daily injections, it is expensive, and can cause weight gain. Other pharmacological treatments can be taken orally, but are not as effective at reducing blood glucose, may cause GI or skeletal side-effects, and may be just as expensive as insulin (Nyenwe et al., 2013).

A second medical aspect of T2DM treatment is preventing, monitoring, and treating co-occurring illnesses. T2DM has many co-occurring and related diseases that impact health outcomes. In 2016, the leading co-occurring disorder was cardiovascular disease, followed by stroke, diabetic ketoacidosis, kidney disease, and hypoglycemia (Center for Disease Control, 2020). Other associated impairments include lower limb amputation and vision loss (Center for Disease Control, 2020). Many of these co-morbid disorders are fatal on their own. It is estimated that diabetes type 1 and 2 complications cost the United States $327 billion and contributed to over 270,000 deaths in 2017 (Center for Disease, 2020). It is important that individuals with increased risks of T2DM, or those diagnosed with T2DM, are monitored and treated for co-occurring disorders.

Cognitive Functioning

Cognitive functioning may be understood and evaluated as both a person's cognitive abilities and their functional cognition. Cognitive abilities are individual cognitive skills, measured by individualized tasks that separate these skills from one another (Galloti, 2018). For example, on a neuropsychological battery an individuals' attention, memory, executive function, etc., may be assessed in ways that attempt to separate these functions. Separating these cognitive abilities allows medical providers to better identify diseases and disease

processes. Additionally, measuring and tracking an individual's cognitive abilities can lead to early recognition of cognitive changes and decline (Morley et al., 2017).

While correct diagnosis is important, understanding a patient's functional cognition is also extremely important. Functional cognition is an amalgamation of cognitive abilities, cognitive styles, personal habits, routines, and environmental factors (Giles et al., 2017; Wolf et al., 2019). Thus, functional cognition is a fuller picture of how patients may function in their daily lives. Functional cognition can be assessed by evaluating activities of daily living. Both measures of cognitive functioning are useful to gain a better clinical picture of a patient with T2DM.

Known influences on Cognition in patients with T2DM

Treatment and prevention of T2DM in African American older adult communities are not only vital to physical health but also cognitive health. The research shows that diabetes has a negative impact on cognitive functioning (Mankovsky et al., 2018). For instance, individuals with T2DM are one and a half to two times more likely to develop dementia (Sutherland et al., 2017). T2DM is also associated with cerebral atrophy and a greater risk for lunar infarcts (Biessels & Reijmer, 2014). Earlier onset of T2DM may produce more severe cognitive deficits, and diabetes likely speeds the rate of cognitive decline (Awad et al., 2004). A recent study conducted by Mankovsky et al. (2018) found T2DM is associated with slowed attentional and perceptual processing and physical brain differences relative to those without T2DM.

Other findings suggest that diabetes impacts processing speed and other executive functions (Small et al., 2001; Sommerfield et al., 2004; Yeung et al., 2009). For example, Yeung, Fisher, and Dixon (2009) assessed cognitive functioning measures in 465 people to

determine differences between individuals with diabetes and healthy controls. They found individuals with diabetes performed significantly worse on tasks that required planning, sentence completion, and quickly processing information. Similarly, other research has shown cognitive deficits in older adults with T2DM are most consistently observed on measures of processing speed while tasks like visuospatial abilities and language function are preserved (Awad et al., 2004; Yeung et al., 2009). In sum, the literature shows that T2DM negatively impacts cognition.

Disease Management

While many studies connect T2DM with deficits in cognitive functioning, other studies indicate that these deficits are not inevitable, suggesting that it is poor management of T2DM that produces cognitive functioning deficits. According to Hughes et al. (2018), poorly managed T2DM is related to poorer cognitive functioning in African Americans, while African Americans with well-managed T2DM performed no differently on executive tasks than healthy controls. Another study conducted that same year found that patients with well-managed T2DM did not have significant reductions of neural white matter or processing speed when compared to healthy individuals (Mankovsky et al., 2018). A longitudinal study followed 68 patients with T2DM, who were recruited by their healthcare providers, for a period of four years to measure changes in cognitive functioning (Van Den Berg et al., 2009). They compared scores on cognitive functioning to those of a healthy sample and found no difference in the rate of decline between those who had well-managed T2DM and those who did not have diabetes. Because the participants in this study were actively engaged with their healthcare provider, these results provide greater support that positive diabetes management is linked to cognitive functions in those with T2DM. Thus, disease management, healthcare,

and medication adherence are likely vital to preserving cognitive functions in those with T2DM. These studies highlight the important distinction between managed and unmanaged diabetes' role in cognitive change.

Depression and Anxiety

The relationship between psychological wellbeing, T2DM, and cognitive functioning appears to be intricate and cyclical. When dealing with stressful events, individuals with T2DM often utilize negative or inadequate coping strategies that fail to reduce distress, inhibiting overall wellbeing (Rane, 2011). Poor coping may lead to increased despair, hopelessness, and powerlessness that in turn cause decreased medication adherence and levels of self-care behaviors (Walker, 2012). Thus, T2DM may be associated with decreases in psychological wellbeing, and also worsened by decreases in overall wellbeing.

Depression, a common measure of wellbeing, impacts cognitive functioning in older adults resulting in decreased working memory and slower processing speed (Alexopoulos et al., 2005; Morimoto et al., 2011). Clinical levels of depression may have a larger effect on those with T2DM as it can lead to diminished self-care and poorer metabolic control in individuals with T2DM (Hajimonfared et al., 2016; Sullivan, 2013). Depression is highly comorbid with T2DM; around 20 percent of individuals with T2DM have moderate to severe depression (Khan et al., 2019). In African American older adults, depression rates are even higher, with 25 percent having clinically significant depression (Cooper, 2014).

Another measure of well-being, anxiety, has also been shown to negatively impact many executive functions including visual-spatial memory, working memory, planning, and decision making (Lusasik et al., 2019; Miu et al., 2007; Yao et al., 2018). People with T2DM have a higher prevalence of anxiety (Li et al., 2008), which may be a factor in T2DM-related

cognitive changes. For example, studies have shown that inducing T2DM in animals increases anxiety levels and changes the blood flow and neuronal makeup of the frontal lobes (Asku, et al., 2012). Similarly, inducing hyperglycemic states in humans with T2DM increases anxiety levels and decreases performance on cognitive functioning tasks (Sommerfield et al., 2004). Additionally, findings suggest that inducing even sub-clinical anxiety leads to decreased inhibition and increased somatic symptoms in those with T2DM (Murdock et al., 2017). These studies indicate that it is important to consider wellbeing indicators when assessing cognition in those with T2DM.

Diabetes and African American older adults

Although T2DM affects individuals of all ages and races, older adults and minority individuals are at greater risk (National Institute of Health, 2018). African Americans are 60 percent more likely to be diagnosed with diabetes than Whites (Office of Minority Health, 2020a). Additionally, African Americans with diabetes are two times more likely to be hospitalized with limb amputation, and 3.5 times more likely to be diagnosed with end-stage renal disease than Whites with the disease (Office of Minority Health, 2020a). This racial disparity has been increasing since the 1990s due to the increased rates of risk factors for T2DM seen in the African American population (National Institute of Health, 2018). According to the Office of Minority Health, African American females have the highest rates of obesity than other groups in the U.S., and in 2018, African Americans were 1.3 times more likely to be obese than Whites (2020b). Additionally, in 2018 African Americans were 20 percent less likely to engage in physical activity than Whites. African Americans are 40 percent more likely to have high blood pressure but are less likely to have their blood pressure under control than Whites (Office of Minority Health, 2020c).

Environmental Barriers to Diabetes Management for African Americans

The diabetes management and risk factors for T2DM discussed above are more prevalent among African American older adults, likely because of the barriers to positive health behaviors in the African American community. To understand racial differences, it is important to understand the context of these differences.

Healthy Eating. Rates of obesity in African Americans, specifically women, are higher than in any other demographic group (Center for Disease Control, 2020). Environmental differences are an important factor in these differences in obesity rates. For example, neighborhoods with a higher percentage of African Americans tend to have significantly less access to healthy food (Hilmers, 2012). These neighborhoods also have greater access to unhealthy foods, with two times the number of fast-food restaurants per square mile than predominately White neighborhoods. An example of how this disparity directly increases T2DM risk is highlighted by Corral et al (2011) who surveyed 11,142 African American adults. They found that reduced healthy food options in African American communities likely accounted for a significant reduction in healthy food intake and an increase in overweight and obese African Americans. Corral and colleagues also compared the effect of food disparities between younger and older African Americans. They found that in segregated communities African American older adults ate significantly less healthy food than their younger peers. Additionally, African American older adults were more likely to be obese than young adults. This may be due to a variety of factors, including the fact that African American older adults may not be able to travel the distances required to obtain healthier food options. Thus, the higher rates of obesity as a risk factor may be due to environmental barriers to health behaviors.

Physical Activity. Most adults do not get enough physical activity; inactivity is now identified as a leading cause of America's deadliest diseases: cardiovascular disease, stroke, diabetes, and cancer (Kohl et al., 2012). Activity participation is lowest in African American communities, particularly for older adults (Williams et al., 2018). One study of middle-aged African American women found that African American women may consider physical activity a "luxury" and have positive body images despite increased weight (Im et al., 2012).

Additionally, African Americans may feel unsafe walking outside, as they are more likely to be stopped by police, ticketed as a pedestrian, and are twice as likely than Whites to be killed as a pedestrian (NAACP, 2020; Smart Growth America, 2019). African American communities tend to have fewer safe locations for physical activity. Often sidewalks are non-existent or are cracked and uneven increasing the risks of falls or injury in older adults or those with walking impairments (Gallagher et al., 2010; National Institute of Environmental Health Services, 2019). Wen and colleagues (2013) reported a correlation showing that as the number of African American individuals increases in a community, the amount of green space for activity in that community decreases. Thus, the opportunity to engage in physical activity is limited, likely contributing to higher obesity rates in African American communities.

Medical Treatment Affordability. According to the Diabetes Association (2020), individuals diagnosed with diabetes incur around $10,000 per year in costs attributed to care; these incurred expenses are divided among inpatient hospitalizations, prescription medications, supplies, and office visits. For the average African American family, that is around 25 percent of their annual income (Bureau of Labor Statistics, 2019). Around 70 percent of costs associated with diabetes in the United States are paid by insurance, such as

Medicaid, Medicare, and the military (American Diabetes, 2020). This highlights the need for low-income individuals to have some form of insurance coverage. However, in 2018 the uninsured rate among African Americans was 9.7 percent, nearly double the rate of uninsured Whites (5.4 percent) (Berchick et al., 2019). In 2016, only 45% of older African Americans had Medicare, Medicaid, or supplemental private health insurance (U.S. Department of Health and Human Services, 2018). This is a direct barrier to care for African Americans with T2DM as individuals who have diabetes and are uninsured or underinsured attend 60 percent fewer doctors' appointments, are prescribed 52 percent fewer medications, and have 168 percent more emergency department visits compared to individuals with adequate insurance (American Diabetes, 2020).

Distrust

Another likely barrier to African American older adults receiving proper T2DM care is distrust in the healthcare system. Distrust has been defined as a reaction to negative perceptions and expectations of malevolent intentions, or a desire to buffer oneself from the negative actions of others (Lewicki et al., 1998; Lumineau, 2017; Kramer, 1994). Researchers commonly define distrust as a lack of confidence in, or the suspicion that a person or organization does not care about one's welfare (Kramer, 1994). Suspicion is considered a central component of distrust, as distrust is focused on those suspected of trying to take advantage, or who fail to follow up on commitments (Deutsch, 1958; Lewicki et al., 2006).

Researchers argue that distrust is an independent construct, and that the absence of trust is not distrust (Bohnet & Meier, 2005; Hardin & Hardin, 2004; Guo et al., 2017). Individuals may trust a certain person or institution while having an equally valid distrust of

them. This complex relationship allows for trust and distrust to be simultaneously present. For example, research has shown that trust may occur in some domains of a relationship and distrust in other domains (Sitkin & Bijlsma-Frankema, 2018). Findings such as these support the construct of distrust as a distinct judgment rather than simply a lack of trust (Bies et al., 2018; Hardin, 2004; Lewicki et al., 1998; Sitkin and Bijlsma-Frankema, 2018).

Distrusting an individual or an organization may be a rational response in certain contexts. Appropriately placed distrust can be a valuable tool against exploitation, allowing individuals to be more suspicious of those trying to persuade or manipulate them (Darke & Ritchie, 2007; Friestad & Wright,1994; Kirmani & Zhu. 2007; Lumineau, 2017). Distrust may be a signal that one is not exploitable (Lumineau, 2017). However, distrust may have negative ramifications as well. Distrust may lead to behaviors that undermine cooperation, obstructing social exchange at an individual, organizational, and societal level (Axelrod, 1984; Bijlsma-Frankema et al., 2015; Lumineau, 2017).

Learning to Distrust

Distrust does not appear to be hereditary. Reimann et al., (2017), conducted a study of 324 Monozygotic and 210 Dizygotic twins, to assess the genetic heritability of distrust as a personality characteristic. Their study found that distrust is not genetic, but that it is influenced by socialization. Early-life experiences can cause distrust to occur, but distrust is also developed, or strengthened during experiences in later life. Distrust appears to be learned through experiences and secondhand knowledge (Goold, 2002).

Healthcare System distrust

Distrust in the healthcare system is a barrier to individuals seeking healthcare, accepting and adhering to medical recommendations, building trustful provider relationships,

and maintaining continuity of care (Armstrong et al., 2006; Rowe & Calnan, 2006; Thom et al., 2004; Whetten, et al., 2006). These barriers lead to ineffective and inefficient healthcare (Armstrong et al., 2006). Researchers have long understood that healthcare distrust is an important contributor to racial disparities in health and health care (Halbert et al., 2006). This project assesses Healthcare System distrust as it related to African American older adults with T2DM.

Health Care System Distrust in African Americans

Distrust of healthcare results in an especially severe disadvantage for African American older adults with T2DM as distrust contributes to health inequalities despite improved health interventions and increased knowledge of risk factors for diseases like T2DM (Hatzenbuehler et al., 2013). This is evidenced by the fact that the prevention, diagnosis, and treatment of T2DM has advanced greatly, but T2DM care and prevention has lagged in African American populations due to a variety of factors including distrust (Nam et al., 2011). Prevention and self-management interventions are estimated to lag by 10-years in African American communities (Diabetes Prevention Program, 2013; Haas, Maryniuk, Beck et al., 2012). One study found that distrust of healthcare was a direct barrier to treatment for African Americans with T2DM, and an indirect barrier to their optimal quality of life (Sherman & Williams, 2018). This study also highlighted that knowledge of T2DM was not a barrier for their participants, suggesting that even when patients are knowledgeable about T2DM and its treatment, distrust is a barrier to adequate healthcare.

Historical Trauma. While past and current racism and discrimination may lead to distrust in African Americans of all ages, it is likely more severe for African American older adults as they have experienced a longer history of racism (Koss & Baker, 2017). Therefore,

it is likely that distrust could be more deeply ingrained, and have a larger impact on, African American older adults and their wellbeing. Kennedy, Mathis, and Woods (2007) point to the Tuskegee Syphilis study as one of the most well-known examples of breach of trust of African American participants, but it is not the only one (see also Kenny, 2015; Washington, 2006). This mistreatment has created suffering and distress which contributes to healthcare system distrust among African Americans today.

Lack of Cultural Competence. Healthcare system distrust among African Americans is not solely due to historical events. Distrust is maintained in our healthcare system by power differences. There is a shortage of African American health care providers and many providers exhibit poor cultural competence (Kennedy et al., 2007). This has led to a lack of cultural competency in the healthcare setting as a whole. For example, T2DM interventions may exacerbate distrust by ignoring culturally-relevant information. One study found that African American older adults especially distrust treatments involving injections; this study concluded that fear of injections was related to a common belief in African American culture that participants in the infamous Tuskegee study were injected with syphilis (Musa, et al., 2009). Despite this, injections of insulin are the most utilized treatment for T2DM management.

Interventions may also be incorrectly tailored to African American individuals. For example, in the case of women pointed out in the previous study, intervention goals may be targeted at taking medication to be able to be physically well enough to play with her children, as opposed to taking medication to feel better (Musa et al., 2009). Shiyanbola, Brown, and Ward (2018) point out that while many African American women report needing to adhere to T2DM treatments to be able to care for children, typical interventions only target

the goals of symptom reduction and disease complications. Culturally-relevant interventions that are tied to an individual's goals may be more likely to increase adherence.

Patient Provider Communication. The lack of African American health care providers and limited cultural awareness among White providers may also add to the problem of poor communication between African Americans and their providers. Building trusting relationships with providers increases the likelihood of an individual scheduling and attending future appointments, and adhering to a medical regimen (LaVeist et al., 2009). Many African American older adult patients report an overall lack of positive communication with healthcare providers (Anderson, 1990; Nam et al., 2011). One factor that may cause poor provider communication is that uninsured or under-insured African Americans tend to rely on clinics and emergency departments with rotating providers for their usual source of care (LaVeist et al., 2009). This leaves many African Americans unable to create trusting relationships with providers that could enhance communication. This lack of trust and communication has been shown to impact African American patients directly. Physicians report that they perceive African Americans to be less truthful when reporting symptoms; this has led to African Americans being more likely to be misdiagnosed in mental and physical healthcare settings (Eack et al., 2013).

Quality of care. African Americans are often treated differently by providers and may develop distrust from one negative encounter that leads to a broad distrust of healthcare (LaVeist et al., 2009). The National Healthcare Quality and Disparities report (2019) measured processes of care, outcomes of care, and perceptions of care for minority members. Data on these measures were collected on a national level via the Agency for Healthcare Research and Quality, the Centers for Disease Control and Prevention, Centers for Medicare

and Medicaid, and other national organizations (Agency for Healthcare Quality, 2019). Findings suggested that African Americans receive worse quality of care than Whites. For example, African Americans are less likely to receive pain medication and anti-psychotic medications than Whites (Copeland et al., 2003; Hoffman et al., 2016; Kelly et al., 2006). African Americans also experience longer wait times for emergency medical care, even when immediate care is proven to increase survival, like in stroke (Karve et al., 2011; Lewis & Schrader, 2013). In 2017, nearly half of all measures of person-centered care, patient safety, and effective treatment showed worsening care or no change in care for African American patients since 2000. In addition, 80 percent of affordable care measures showed no change or worse affordability for African Americans since 2000 (Agency for Healthcare Quality, 2019). The findings in each of these studies held up after controlling for individual income, insurance status, and residence location.

Measuring Healthcare System Distrust

There have been a myriad of studies that have examined distrust to understand relationships between demographics and health outcomes (Benin et al., 2006; Halbert et al., 2006; Katapodi et al., 2010; Piette et al., 2005; Russell, 2005; Thorne et al. 1998). Much of the research conducted on healthcare distrust has focused on limited segments of healthcare - distrust of providers, medical research, hospitals, or health insurance - instead of assessing overarching healthcare system distrust (Balkrishnan et al., 2003; Corbie-Smith et al., 2002; Zheng et al., 2003). For example, a major line of research focuses on the interpersonal distrust of physicians (Keating et al., 2002; O'Malley et al., 2004; Thom, 2001). Racial differences may not be addressed when only examining this one aspect of healthcare distrust as White older adults and African American older adults exhibit healthcare distrust (Kennedy et al., 2007; Musa et al., 2009). African American older adults' distrust more often manifests as institutional distrust as opposed to the interpersonal distrust White older adults typically exhibit (Musa et al., 2009). Therefore, studying only small aspects of healthcare distrust severely limits understanding of how system-wide healthcare distrust impacts African American older adult patients.

Another limitation of health care system distrust research is the populations it draws from. Trust has been researched predominately in primary care and other outpatient settings via self-report surveys (Locurto & Berg, 2016). This means current findings are from samples that trust the healthcare system enough to be at a healthcare establishment and volunteer their opinions directly to healthcare systems. This is a problem because it only shows a small portion of the general population: those who trust the healthcare system and

providers enough to present to a health clinic. Current research is likely missing data from those who distrust healthcare systems.

A commonly used self-report survey for healthcare system distrust, the Healthcare System Distrust Scale (HCSD scale; Rose, 2004) has been used to uncover relationships between distrust and health outcomes in many populations. According to Armstrong and colleagues (2006), the original HCSD scale was created after researchers recognized that distrust was not being fully captured by instruments measuring trust, as distrust is not simply the absence of trust. The original HCSD scale was a 10-item measure designed by utilizing focus groups made up of 38 individuals, 53% men, 19 African American, 14 White, and five Asian American (Rose et al., 2004). The focus groups defined the dimensions of health care system distrust and developed a definition of the health care system, combining hospitals, health insurance companies, and medical research. These same focus groups then generated items related to healthcare system distrust, and other items were used from existing scales of provider trust. Think-aloud groups and a pilot survey of 400 participants (62 percent female; mean age 41 years; 43 percent African American, 45 percent White, four percent Hispanic, two percent Asian American, and six percent other) were used to create the final scale. Through this method, four distrust dimensions were identified: honesty, confidentiality, competence, and fidelity. According to Armstrong et al (2006), the original scale had an internal consistency of 0.75 and item-total correlations ranged between 0.27 and 0.57; scale scores correlated positively with age and African American race.

Four years after the original scale was created, the literature had better-defined healthcare system trust as “the belief that some entity will act in one’s interest in the future” and “the perception that the entity wants to do what is needed” (Shea et al., 2008, p. 727).

This led to a newly developed version of the HCSD that included scales reflecting this new definition by including subscales of technical congruence (i.e. The health system has the ability to care for an individual) and value congruence (i.e. The health system wants to care for an individual) (Shea et al., 2008). According to Shea and colleagues, the revised HCSD scale was designed with content validity as a major priority. They first used qualitative methods (i.e. reviewing the transcripts of the original focus groups and 1:1 interviews with 'experts' to assess understanding and wording of items) to create new scale content. This left the Revised HCSD scale with 26 items. Next, they conducted a cross-sectional survey of 144 African American individuals, 92 White individuals, and 19 who were labeled as 'other racial identifying individuals'. Participants for their pilot were 22-75 years of age, with Whites in their sample reporting significantly higher education and income. Factor analysis revealed two-factor loadings among White and African American individuals: values and competence. The total scale and both of the subscales had relatively high internal consistency among White (α: 0.87 total scale, 0.79 competence, 0.77 values) and African American (α: 0.82 overall scale, 0.77 competence, 0.73 values) individuals. The final revised HCSD scale is a nine-item scale with total scores ranging from nine (*low distrust*) to 45 (*high distrust*). The HCSD scale includes two validated subscales: Competence Distrust and Values Distrust. The Competence Distrust scale has four items with a score ranging from five to 20 and assesses the technical congruence of the healthcare system (e.g. The healthcare system makes too many mistakes). The Values Distrust scale has five items with a score ranging from five to 25 and assesses the values congruence of the healthcare system (e.g. The healthcare system puts making money above patients' needs).

Health and Distrust

Healthcare system distrust affects a myriad of health behaviors in the general population, including seemingly simple behaviors like how much an individual is willing to disclose about themselves and how much they cooperate in treatment (Mechanic, 1998). Healthcare system distrust is associated with a significant reduction of preventative and routine healthcare utilization (Rose et al., 2004). It is directly related to delays in seeking healthcare, which may complicate treatment and increase the cost of treatment (LaVeist et al., 2009). These outcomes of delays in seeking healthcare may lead to additional anxiety or fears of healthcare, therefore, exacerbating distrust of healthcare. When patients with high levels of healthcare system distrust do utilize healthcare systems they may not adhere to medical regimens (Rose et al., 2004). These negative health behaviors will likely have negative consequences for survival in those with chronic illnesses like T2DM.

Distrust and African American Health

Utilization. There is evidence that distrust may be impacting how African Americans utilize healthcare. Research shows that African Americans are less likely to utilize available preventative services if they distrust healthcare (O'Malley et al., 2004). One study found that African American older adults are less likely to utilize preventative and routine healthcare, like mammograms and check-ups, if they distrust their healthcare providers (Musa et al., 2009). Research has also uncovered racial discrepancies in the utilization of follow-up care. One study assessed similarly injured White and African American patients in an urban emergency department and found that African American patients were less likely to attend rehabilitation follow-up appointments than Whites (Chun Fat et al., 2019). Whether this is

due to distrust is unknown, as a variety of factors discussed above may influence decisions and the ability to utilize healthcare.

Adherence. Many factors play a role in reduced adherence to treatment, but researchers suggest distrust is a major health risk for African Americans with T2DM (Shiyanbola et al., 2018). As discussed, medication adherence is vital for individuals with T2DM. Even when medication access is equal, African Americans are less adherent to prescribed medications than Whites (Heisler et al., 2007; Kulik et al., 2011; Trinacty et al., 2009). These findings remain significant when controlling for lack of insurance coverage and quality of healthcare (Adams et al., 2005; Schectman et al., 2002; Trinacty et al., 2007). One study found that fear or dislike of medications among African Americans results in fewer medication refills than White individuals who also fear or dislike medication (Serman & Williams, 2018). As with utilization, many factors outlined above likely play a role in these findings, but distrust may explain some of the above racial differences.

African American older adults with T2DM and Distrust

To the researcher's knowledge, there is no literature on the direct effects distrust of healthcare has on diabetes management. Though distrust has been shown above to reduce healthcare utilization and adherence in multiple health settings and with a myriad of ailments, no literature examines the assumption that distrust is directly responsible for effects on diabetes management. There is however a growing body of literature exploring distrust of T2DM medication, but outcomes and impacts have not yet been assessed. For example, in one qualitative study, a 50-year-old African American male was asked how he felt when first diagnosed with T2DM. He shared fear that he would have to depend on medication for survival, and most other participants echoed his response (Serman & Williams, 2018). A

separate study assessing the perception of medication adherence among African American older adults with T2DM found that reasons for non-adherence to medications included negative perceptions of T2DM medicine (Shiyanbola et al., 2018). In the study, participants reported feeling that medicine prescribed was unsafe, ineffective, or frustrating to take and that this would cause intentional non-adherence to their T2DM medication. Still, other participants in the study reported not taking medication because they do not believe or trust their diagnosis. The findings that highlight African American voices' concerns about taking T2DM medications are just a start to the needed research. Healthcare distrusts impact on diabetes management should be further explored.

The Current Study

The present study examined the psychological and behavioral factors that contribute to the relationship between T2DM and cognitive health in African American older adults. This study assessed the effects healthcare system distrust has on the cognition of African American older adults with T2DM via diabetes management behaviors. The literature reviewed above noted ways that healthcare system distrust impacts health care behaviors. To date, the literature has not directly examined distrust's impact on diabetes management. Findings in this study may allow theories of how distrust impacts health behaviors to be expanded to diabetes management. The literature has highlighted the relationship between diabetes management and cognitive functioning in patients with T2DM. However, researchers have ignored cultural factors, making it important to replicate these findings in African American older adults with T2DM.

The current literature fails to connect healthcare distrust, diabetes management, and cognition among African American older adults with T2DM. It is important to address this

gap to better serve and care for these patients. The purpose of the study was to assess and understand these relationships by answering four questions: (1) does the current understanding of healthcare system distrust's negative impact on health behaviors remain true for diabetes management in African American older adults with T2DM? (2) does the current understanding of diabetes managements' impact on cognitive functioning remain true for African American older adults with T2DM? (3) is healthcare system distrust related to cognitive functioning in African American older adults with T2DM? and if so, (4) is the relationship between health care system distrust and cognitive functioning partially mediated by diabetes management in African American older adults with T2DM? Because many factors go into the development of distrust (e.g. quality of care), and because distrust appears to be learned, different variables may impact cognition beyond what one study can explain. Therefore, this study proposes that diabetes management is only a partial mediator for the relationship between health system distrust and cognition.

If healthcare system distrust impacts cognition in African American older adults with T2DM, this project may lead the way for targeted interventions to begin to build more trusting relationships between African American older adults with T2DM and their healthcare providers. These interventions may increase cognitive function and overall wellbeing in African American older adults with T2DM.

Hypotheses

Hypothesis One

H1: In African American older adults with T2DM, healthcare system distrust would be negatively related to diabetes management.

Hypothesis Two

H2: In African American older adults with T2DM, poorer diabetes management would be related to lower scores on tasks of cognitive functioning. These were assessed separately for cognitive ability and perceived functional cognition.

Hypothesis Three

H3: In African American older adults with T2DM, healthcare system distrust would be negatively related to measures of cognitive functioning. These were assessed separately for cognitive ability and perceived functional cognition.

Hypothesis Four

H4: In African American older adults with T2DM, there would be a negative relationship between healthcare system distrust and cognitive functioning that was partially mediated by T2DM management. These were assessed separately for cognitive ability and perceived functional cognition.

CHAPTER 3

METHODOLOGY

Multicultural Responsiveness

This study had an intersectional nature that sought to analyze members from multiple cultures including race, age, and ability cultures that lie outside of the researcher's own culture. The American Psychological Association (APA) understands concerns may arise when researchers from different cultures work with multicultural populations, so they offer guidelines for work with multicultural populations. These guidelines were first provided within the model of multicultural responsiveness (American Psychological Association, 2002). This model explains the importance of 1) being aware of one's cultural values and assumptions to engage in reflective practice, 2) having and updating knowledge about how culture influences individual experiences, and 3) continually learning skills needed to engage in culturally-relevant interventions to promote health and equity in diverse communities.

Self-awareness & reflective practice

It is important that researchers understand that power and privilege influence research with racial and ethnic minorities, and that social justice issues are essential to racial and ethnocentric responsiveness (APA, 2017). Additionally, researchers need to be aware of the role science has in informing policy (APA, 2017). Thus, a researcher's awareness of their own biases must be assessed to successfully work with individuals who are racially or ethnically different from themselves. Having general knowledge about the theories behind aging, and social aspects of the aging process as well as a recognition of bias or stigma surrounding aging is also important when working with African American older adults (APA, 2013; APA, 2017). The researcher has spent the last six years conducting research and

working with African American older adults. This has allowed the researcher to share time, hear and understand ideas, and find similarities and differences with African American older adults of the community.

While being exposed to the culture of African American older adults, the researcher has begun to learn how to appropriately assess and understand cultural differences. These learning experiences were applied directly to the study. For example, many discussions with African American older adult community members surrounding recruitment and retention of African American older adults in studies have elicited places where African American older adult community members may be reached. African American older adults in the community have suggested recruiting for studies in senior centers, senior housing, community events, churches, radio ads, and newspapers. Flyers and word-of-mouth are other valuable resources for recruiting African American older adults. Research exists to support the ideas garnered from African American older adult community members (Ellish et al., 2009). Importantly, Ellish and colleagues note that a recruitment approach should incorporate direct and indirect activities at a variety of sites to recruit older African Americans into behavioral studies. For example, direct activities may include recruiting online, in local grocery shops, and indirect activities would be via word-of-mouth. This study recruited participants in a variety of community locations.

The location and method of data collection were dictated by the reflection of previous experiences, review of the research, and the current pandemic. Many African American older adults list hesitancy to leave their home as a barrier to participation in research (Ellish et al., 2009). This is likely truer now with current Covid-19 health concerns. The research was conducted exclusively over the telephone to enhance safety.

There is stigma surrounding older adults involving cognitive deficits. Therefore, individuals assessing older adults' cognition should be familiar with measures and criteria for cognitive impairment and have engaged in the evaluation of age-related changes (APA, 2012). Other reflective experiences such as courses taken, time spent considering diversity issues and health disparities, and the researcher's self-reflection of biases have allowed the researcher to consider their own beliefs and reactions more deeply. However, the researcher understands this learning is always ongoing.

Continual development of Cultural knowledge

To continue to better understand culture's influence on African American older adults, this study was planned with special consideration of biases within research methods, analysis, and interpretation. The researcher continues to work within the African American older adult community and has thoughtfully recruited a panel of culturally-sensitive psychologists to help guide this research in their role as dissertation committee members.

Another aspect of continual growth in clinical research lies within a clear explanation of what is being measured, and who findings may apply to. This information allows those interpreting and using study findings to do so in a more accurate manner. Thus, in this study participants were asked important demographic factors such as socioeconomic status, education, and religious beliefs. APA states these are important for giving context (APA, 2019). Older adults and racial minorities should be assessed with the understanding that sociocultural factors heavily influence many physical and mental health outcomes (APA, 2013; APA, 2017). This study assessed sociocultural factors to ensure those differences are part of the interpretation and are reported in this study's outcome. The guidelines additionally state that psychologists who assess older adults and ethnic minorities should use culturally-

and psychometrically- suited instruments (APA, 2013; APA, 2017). This study only employs assessments that are validated for use with African Americans and older individuals. The choice of validated and reliable assessments for this study is additionally in line with the guideline that psychologists be aware of cognitive changes in older adults; the measures used reliably measured cognition with age-related norms.

Promoting health, well-being, and equity for diverse populations

Researchers should strive to conduct and disseminate research that promotes health, well-being, and equity in racial and ethnic minorities. APA (2019) has provided a cultural and ethnic lens when assessing beneficence and non-maleficence, ensuring the research does not harm but rather benefits participants and their community. The researcher acknowledges that if interpreted incorrectly results could be misused to fault or blame African American older adults for distrusting the healthcare system. This study has the potential to lead to great benefits. It aimed to better understand physical and cognitive health in an underserved population, African American older adults with T2DM. Older adults who also hold an ethnic-minority status are the most underrepresented groups in clinical research while simultaneously experiencing the most need for psychosocial interventions (Arean & Thompson, 1996; Hall et al., 2016). Overall, this researcher believes the benefits of this study outweighed the potential risks.

Participants

Fifty African American adults aged 60 years and above, who have been diagnosed with T2DM, were recruited from the community via flyers, announcements in local organizations, and by word of mouth. Participants included 9 men and 41 women aged 60-88. According to Fritz and MacKinnon (2009), when the relationship between a predictor

variable and a mediation variable is expected to be large, and the relationship between the mediator and outcome variable is expected to be large, a sample of 42 participants is sufficient to expect a .80 power for detecting an effect when using bias-corrected bootstrapping mediation analysis. The literature suggests that healthcare distrust should have a large impact on an individual's overall health (Rose et al., 2004). Additionally, overall health has been found to have a large effect on cognition in individuals with T2DM (Mankovsky et al., 2018; Schmidt et al., 2013). This study recruited and analyzed data for 50 participants.

Procedure

Participants were recruited via flyers posted in community centers and libraries, announcements at local churches and neighborhood associations, and from word of mouth (See Appendix A for a copy of the flyer). Interested participants contacted the researcher to schedule an hour-long phone session. To increase trust in study personnel, a trained African American research assistant called participants at the scheduled time to complete all assessments. In light of the pandemic, all data were collected via telephone to ensure participants could maintain CDC social distancing guidelines.

Participants were told the study was to evaluate cognitive functioning in African American older adults with T2DM. Participants completed a demographic questionnaire and were consented. Next, they completed the cognitive functioning assessments. Lastly, participants completed the Beck Anxiety Inventory, Patient Health Questionnaire, Health Care Distrust Scale, and the Diabetes Self-Management Questionnaire in an interview-style format. Participants were not given any feedback about performance on any assessments. After completion of the study, participants were thanked and sent a $20 Visa gift card via

regular mail in appreciation for their time. Along with their compensation, participants received information about contacting the IRB and a link to counseling services and information about diabetes management provided by the American Diabetes Association.

Measures

Demographics

Participants completed a demographic survey that inquired about their age, sex at birth, gender, socioeconomic background, religion, access to healthcare, T2DM diagnosis, other health diagnoses, and any neurological disorders. See Appendix B for a copy of the demographic questionnaire.

Depression and anxiety symptoms were also assessed as descriptive variables. The Patient Health Questionnaire 9 (PHQ; Spitzer, 1999) was utilized to assess depressive symptoms. It is an 11-item screening tool that has been validated and used as a measure of clinical symptoms. Participants are to indicate how much they were bothered by 9 common depressive symptoms (e.g. Little interest in doing things, poor appetite or over eating, trouble concentrating) over the past 2 weeks (0-*not at all*, 1-*several days*, 2-*more than half of the days*, 3- *nearly every day*). It has been validated for use with patients aged 18-99 years, and for use with African Americans (α=.89) (Huang, et al., 2006; Spitzer, 1999). See Appendix B for a copy of this measure.

The Beck Anxiety Inventory (BAI; Beck et al., 1988) was used to measure anxiety symptoms. Participants indicate how much they were bothered by 21 common anxiety symptoms (e.g. numbness or tingling, nervous, fear of dying, indigestion) over the past week (0-*not at all*, 1-*not much*, 2-*moderately*, 3-a *lot*). It is a reliable measure with α= .92. The BAI

has demonstrated reliability in African Americans, α= .88 (Chapman & Woodruff-Borden, 2009). See Appendix B for a copy of this measure.

Cognitive Functioning

Cognitive ability was assessed using the Telephone Interview for Cognitive Status (TICS; Brandt & Folstein, 1988). Functional cognition was assessed using the Instrumental Activities of Daily Living Scale (IADL; Lawton & Brody, 1969).

Cognitive Ability. The Telephone Interview for Cognitive Status (TICS) is an 11-item standardized performance-based test of cognitive ability. It was created as an alternative to in-person assessment of adults aged 60 to 98 years. It takes less than 10 minutes to administer. The TICS measures temporal and spatial orientation (where the participant is and what day, date, year, and season it is), concentration (counting backwards), short-term memory (word-list recall), language ability (sentence repetition), and numerical skills (numerical subtraction, finger tapping). The TICS is sensitive enough to discriminate between healthy adults, adults with mild cognitive impairment, and dementia (Brandt & Folstien, 1988). It has been validated and is reliable, α=.91, for use with older African Americans (Manly et al., 2011). See Appendix B for the script given with this measure.

Perceived Functional Cognition. The Instrumental Activities of Daily Living Scale (IADL) was revised into a self-report format in order to measure perceived functional cognition. It has been utilized and validated as a self-report measure in previous studies (Edwards, 1990, Edwards, 1990; Rubenstein et al., 1984). The IADL (Lawton & Brody, 1969) is an eight-item observation-report assessment of an individual's level of functional cognition. Participants rated their own ability to perform daily activities (e.g. shop, housekeeping, prepare meals, manage finances, and use transportation). It has been found to

reliably measure functional status in a racially and ethnically mixed sample of older adults, α=.85. It has a total score range of 0 (*low functioning*) to 8 (*high functioning*). (see Appendix B).

Healthcare System Distrust

The Healthcare System Distrust Scale (HCSD; Shea et al., 2008) is a nine-item assessment that measures an individual's trust in the healthcare system. Participants rate how much they agree (*Strongly agree, Agree, Neutral, Disagree, Strongly Agree*) with statements about the healthcare system (e.g., The healthcare system does its best to make patients better; The healthcare system covers up its mistakes; the healthcare system lies to make money). It consists of two subscales, a 5-item Values subscale (e.g. Patients get the same medical treatment from the Health Care System, no matter what the patient's race or ethnicity), α=.73, and a 4-item Competence subscale (Patients receive high quality medical care from the Health Care System) , α=.77. It has been validated for use in African Americans, α =.83. Higher scores on this measure represent higher distrust in healthcare. See Appendix B for a copy of this measure.

Diabetes Management

The Diabetes Self-Management Questionnaire (DSMQ; Schmidt et al., 2013) is a 16-item assessment that measures how well an individual perceives they are managing their diabetes. Participants rate how much 9 statements about diabetes management (e.g., I check my blood pressure with care and attention; Occasionally I eat lots of sweets and other foods rich in carbohydrates) apply to them (0-*does not apply*, 1-*Applies to some degree*, 2-*Applies a considerable degree*, 3-*Applies very much*). It consists of four subscales, Glucose Management α =.77, Dietary Control α =.77, Physical Activity α =.76., and Healthcare Use α

=.60. It has been validated for use with African Americans, α =.84. Higher scores on this measure represent perception of better diabetes management. See Appendix B for a copy of this measure.

Statistical Analysis

This study aimed to better understand the role healthcare system distrust has in cognitive functioning among African American older adults with T2DM. To measure the sample's representativeness, sample demographics were compared to reported African American older adult population demographics by the Center for Disease Control and Prevention (Center for Disease Control, 2020). One-tail correlational analyses were used to test H1, H2, and H3 with measures of cognitive ability and functional cognition. This was followed by mediation analysis to assess H4.

Hypothesis One

H1 proposed that in African American older adults with T2DM higher healthcare system distrust would be associated with lower diabetes management. To test H1, a one-tail correlational analysis was conducted on HCSD and DSMQ total scores. To support this hypothesis, there should be a significant negative correlation between total scores on the HCSD and DSMQ.

Hypothesis Two

H2 proposed that in African American older adults with T2DM lower diabetes management would be associated with lower cognitive functioning. To test H2, one-tail correlational analyses were conducted between total scores on the DMSQ and TICS, and between the DMSQ and the IADL. To support this hypothesis, there should be a significant

positive correlation between total scores on the DMSQ and TICS, and the DMSQ and the IADL.

Hypothesis Three

H3 proposed that in African American older adults with T2DM higher healthcare system distrust would be associated with lower cognitive functioning. To test H3, one-tail correlational analyses were conducted between total scores on the HCSD and TICS, and between the HCSD and the IADL. To support this hypothesis, there should be a significant negative correlation between total scores on the HCSD and TICS, and the HCSD and the IADL.

Hypothesis Four

H4 proposed that the relationship between healthcare system distrust and cognitive functioning is partially mediated by T2DM management behaviors. A partial mediation analysis was conducted using a SPSS script and bootstrapping procedures described by Preacher and Hayes (2004). To support this hypothesis the relationship between HCSD and TICS, or HCSD and IADL, should be mediated by DSMQ scores.

CHAPTER 4

RESULTS

Demographics

The sample for this study included 50 community-dwelling African Americans with a mean age of 70 years. Forty-one participants were female and 9 were male. No participants reported severe depression or severe anxiety symptoms. Thirty-six participants rated their healthcare quality of care as 8 or greater on a subjective scale of 1 to 10 (with 1 being worst and 10 being best); 44 rated their healthcare access as 8 or greater. Table 1 and 2 below present participant demographics and health characteristics.

Table 1

Demographic characteristics of sample, n(%)

Participants	N=50
Sex	
Female	*41*(82%)
Male	9(18%)
Education	
<12 years	3(6%)
12 years	18(36%)
>12 Years	28(56%)
Not disclosed	1(2%)
Average Yearly Income	
<$30,000	35(70%)
$30,001 - $50,000	9(18%)
50,001 – $80,000	3(6%)
$80,0001+	2(4%)
Not disclosed	1(2%)
Housing	
Rent	24(48%)
Own	25(50%)
Not disclosed	1(2%)

Table 2

Health characteristics of sample, n(%)

Participants	n=50
Comorbid Conditions	
None	49(98%)
Cardiovascular	1(2%)
Depression Symptoms (PHQ)	
None	30(60%)
Mild	14(28%)
Moderate	6(12%)
Severe	0(0%)
Anxiety Symptoms (BAI)	
None	43(86%)
Moderate	7(14%)
Severe	0(0%)
Length of T2DM Diagnosis	
1 year or less	1(2%)
2-5 years	10(20%)
6-9 years	13(26%)
10+ years	25(50%)
Not disclosed	1(2%)

Data Screening

Using procedures outlined by Warner (2012), one participant data point was identified as a significant univariate outlier for the DSMQ (Participant 45), and a separate participant was a univariate outlier on the IADL (Participant 20). The outliers were not included in any analyses involving those measures. Mahalanobis distance analysis revealed one multivariate outlier on the IADL and HCSD; this outlier was also the univariate outlier on the IADL (Participant 20). That single participant was dropped from IADL-HCSD analyses. Means and standard deviations for predictor outcome variables used are reported in Table 3.

Analysis

In order to assess the relationship between each variable a one-tail bivariate-correlational analysis was conducted between all measure total scores and all measure subscale scores. Results are in Table 4. In this analysis, healthcare distrust was negatively

related to glucose management ($r(48)=-.377$, $p=.004$), dietary control ($r(48)=-.521$, $p<.001$), and physical activity ($r(48)=-.388$, $p<.001$). Healthcare distrust was not related to healthcare use, $r(48)=-.156$, $p=.14$, despite distrust being a known barrier to utilization (Musa et al., 2009; O'Malley et al., 2004). Healthcare use was however positively related to both cognitive measures (TICS, $r(49)=.41$, $p=.001$; IADL, $r(48)=.35$, $p=.006$).

Table 3

Statistical overview of measures

Measures	N	*M*±SD	Min-Max Possible
Healthcare System Distrust Scale	50	27.12±7.26	5-45
Competence Subscale	50	10.98±3.50	4-20
Values Subscale	50	16.14±4.28	5-25
Diabetes Self-Management Questionnaire	49	36.78±8.03	0-48
Glucose Management Subscale	49	11.73±3.51	0-15
Dietary Control Subscale	49	7.63±3.09	0-12
Healthcare use Subscale	49	7.98±1.48	0-9
Psychical Activity Subscale	49	6.78±2.04	0-9
Cognition			
Telephone Interview for Cognitive Status	50	30.58±4.49	0-40
Instrumental Activities of Daily Living	49	7.79±0.611	0-8
Psychological Functioning			
Patient Health Questionnaire	50	4.08±4.41	0-27
Beck Anxiety Inventory	50	10.02±8.77	0-63

Table 4.

Correlations Matrix between Measurements and Subscales (N=50)

	1	2	3	4	5	6	7	8	9
1. TICS									
2. IADL	.340** [a]								
3. DSMQ	.175 [a]	.587*** [b]							
4. Glucose Management	.090 [a]	.521*** [b]	.788*** [b]						
5. Dietary Control	.072 [a]	.390** [b]	.809*** [b]	.411** [b]					
6. Physical Activity	.209 [a]	.387** [b]	.747*** [b]	.415*** [b]	.520*** [b]				
7.Healthcare Use	.351** [a]	.581*** [b]	.626*** [b]	.369** [b]	.385** [b]	.433*** [b]			
8.HCSD	-.099	-.367** [a]	-.536*** [a]	-.377** [a]	-.521*** [a]	-.388*** [a]	-.156 [a]		
9.Competence	-.120	-.423*** [a]	-.467*** [a]	-.350** [a]	-.422*** [a]	-.321* [a]	-.183 [a]	.917***	
10. Values	-.069	-.276* [a]	-.524*** [a]	-.352** [a]	-.537*** [a]	-.393** [a]	-.115 [a]	.945***	.737***

**p ≤ .05; **p ≤ .01; *** p ≤ . .001*

[a]One outlier dropped from analysis, N=49

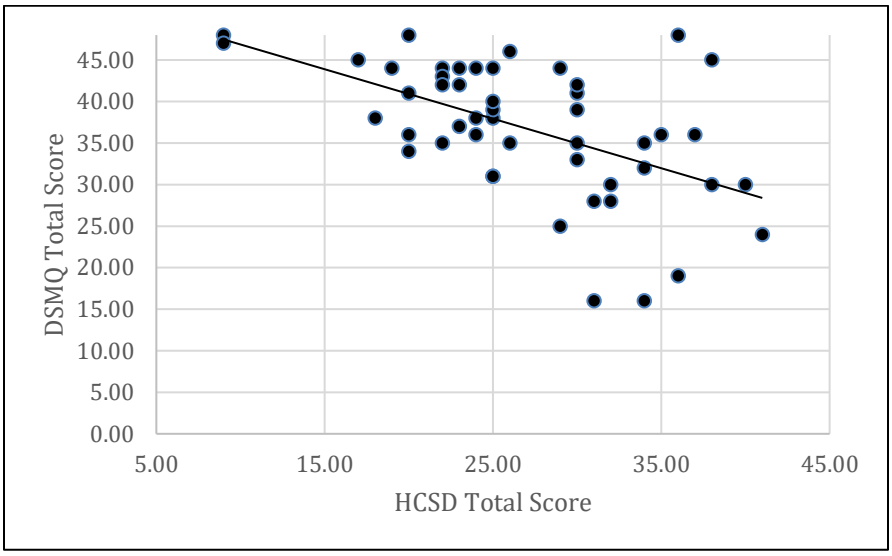
[b]Two Outliers dropped from analysis, N=48

Hypothesis One

Hypothesis One stated that healthcare system distrust would be negatively related to diabetes management. A bivariate one-tail correlational analysis was conducted to analyze the correlation between healthcare system distrust (HCSD) and diabetes management (DSMQ). As hypothesized, the HCSD total score and DSMQ total were significantly negatively correlated, $r(48)=-.536$, $p<.001$. See Figure 1 for a scatterplot of this relationship.

Figure 1

Diabetes Management and Healthcare System Distrust



Note. One outlier dropped from analysis

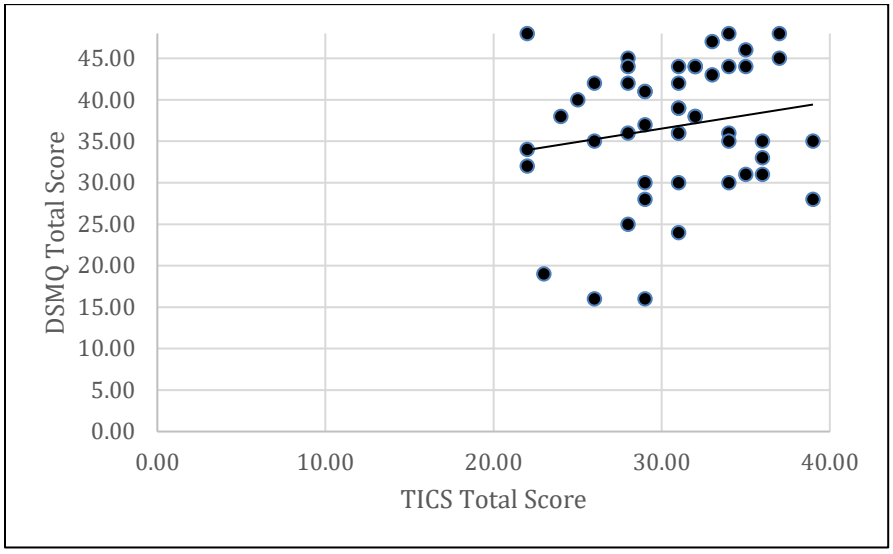
Hypothesis Two

Hypothesis Two stated that poorer diabetes management would be related to poorer cognitive functioning. Thus, higher scores on the DSMQ, representing greater diabetes management, would be positively related to the TICS and IADL. A bivariate one-tail correlational analysis was conducted to analyze the correlation between diabetes management (DSMQ) and cognitive ability (TICS). Contrary to Hypothesis Two, the DSMQ

total score and TICS total score were not significantly correlated, $r(48)=.175$, $p=.12$. See Figure 2 for a scatterplot of this relationship. A bivariate one-tail correlational analysis was conducted to analyze the relationship between diabetes management (DSMQ) and perceived functional cognition (IADL). The DSMQ total score and IADL total score were significantly correlated, $r(47)=.587$, $p<.001$. Figure 3 is a scatterplot of this correlation.

Figure 2

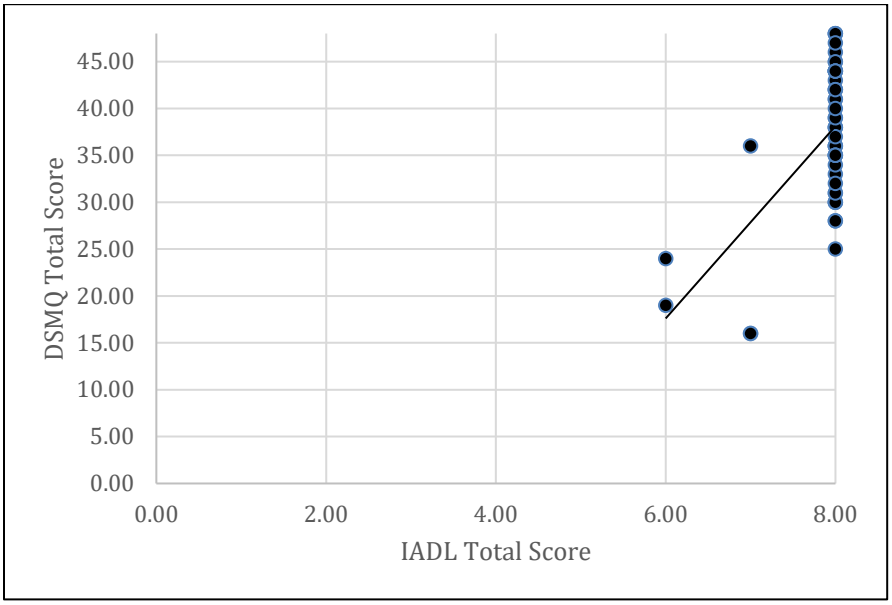
Diabetes Management and Cognitive Ability



Note. One outlier dropped from analysis.

Figure 3

Diabetes Management and Perceived Functional Cognition



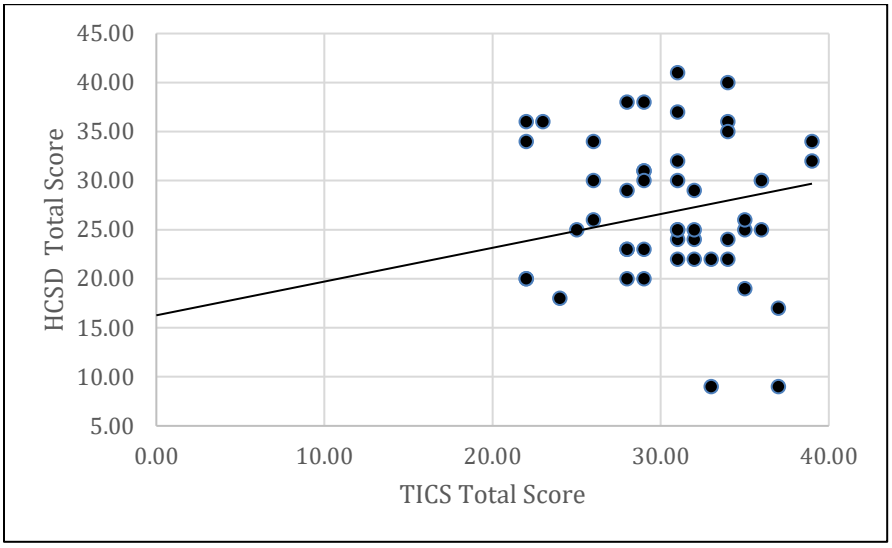
Note. Two outliers dropped from analysis.

Hypothesis Three

Hypothesis Three stated that healthcare system distrust would be negatively related to cognitive functioning. A bivariate one-tail correlational analysis was conducted to analyze the correlation between healthcare system distrust (HCSD) and cognitive ability (TICS). Contrary to the stated hypothesis, the HCSD total score and TICS total score were not significantly correlated, $r(49)=-.099$, $p=.25$. See Figure 4 for a scatterplot of this relationship. A bivariate one-tail correlational analysis was conducted to analyze the correlation between healthcare system distrust (HCSD) and perceived functional cognition (IADL). The HCSD total score and IADL total score were significantly negatively correlated, $r(48)=-.367$, $p=.01$ indicating that higher scores of functional cognition were associated with lower scores of healthcare system distrust. See Figure 5 for a scatterplot of this correlation.

Figure 4

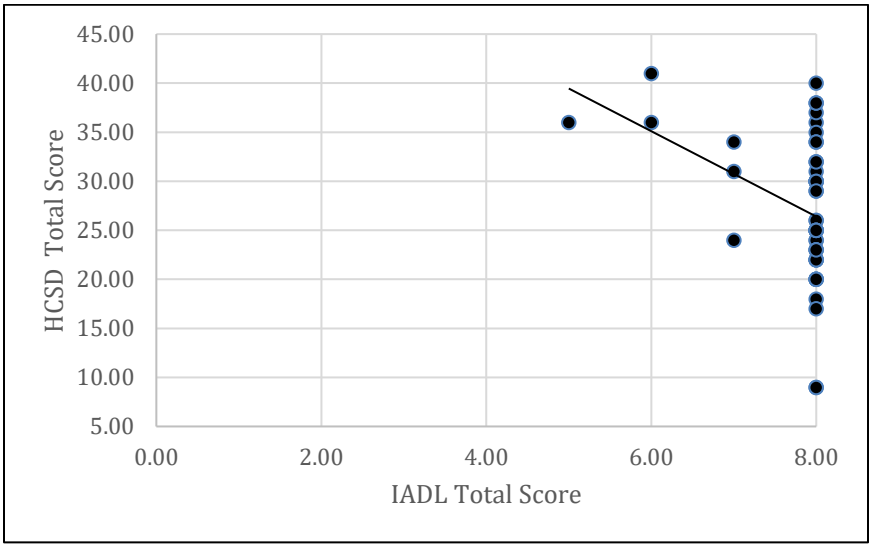
Healthcare System Distrust and Cognitive Ability



Note. One outlier dropped from analysis.

Figure 5

Healthcare system distrust and functional cognition



Note. One outlier dropped from analysis.

Hypothesis Four

Hypothesis Four stated that the negative relationship between healthcare system distrust and cognitive functioning would be partially mediated by T2DM management. However, the HCSD total score and cognitive functioning (TICS) were not significantly correlated, $r(49)=-.099$, $p=.25$. Thus, a multiple regression analysis is not warranted (See Figure 4). When assessing perceived functional cognition, HCSD total score and IADL were significantly correlated, $r(48)=-.367$, $p=.01$ (See Figure 5). Therefore, a mediation analysis was conducted. This mediation analysis was tested using the bootstrapping method with bias-corrected confidence estimates (Preacher and Hayes, 2004). The 95% confidence interval of the indirect effects was obtained with 5000 bootstrap resamples (B=.0085; CI=-.03 to -.004). HCSD scores were used to predict IADL scores. DSMQ scores were expected to mediate the relationship between healthcare system distrust and perceived functional cognition. See Table 6 for standardized and standardized coefficients and Figure 6 for a diagram of the mediated relationship. Using steps described by Preacher and Hayes (2004), HCSD scores were a significant predictor of IADL scores, as shown in Table 5. Next, HCSD scores were used to predict the mediator variable DSMQ scores, which showed that HCSD was positively related to DSMQ, $t(46) = -4.20$, $p < .001$. Third, the relationship between the mediator, DSMQ scores, and the dependent variable, IADL scores, was examined. Diabetes Management was positively related to IADL, $t(46) = 3.98$, $p < .001$. Lastly, the mediated relationship between HCSD and IADL was examined for a reduction in prediction when the mediator was added to the model. Full mediation was achieved. Thus the relationship between HCSD and IADL was no longer significant after controlling for diabetes

management, $t(46) = -.314$, $p = .75$. The Sobel test was used to determine that the ab effect was significantly greater than zero, $Z = -2.89$, $p = .003$.

Table 5

Model Summaries for Mediation Analysis

Model	*F*	*P*	R^2
HCSD predicting IADL	(1,46)=6.07	.02	.12
HCSD predicting DSMQ	(1,46)=17.62	<.001	.28
HCSD and DSMQ Predicting IADL	(1,45)=11.93	<.001	.35

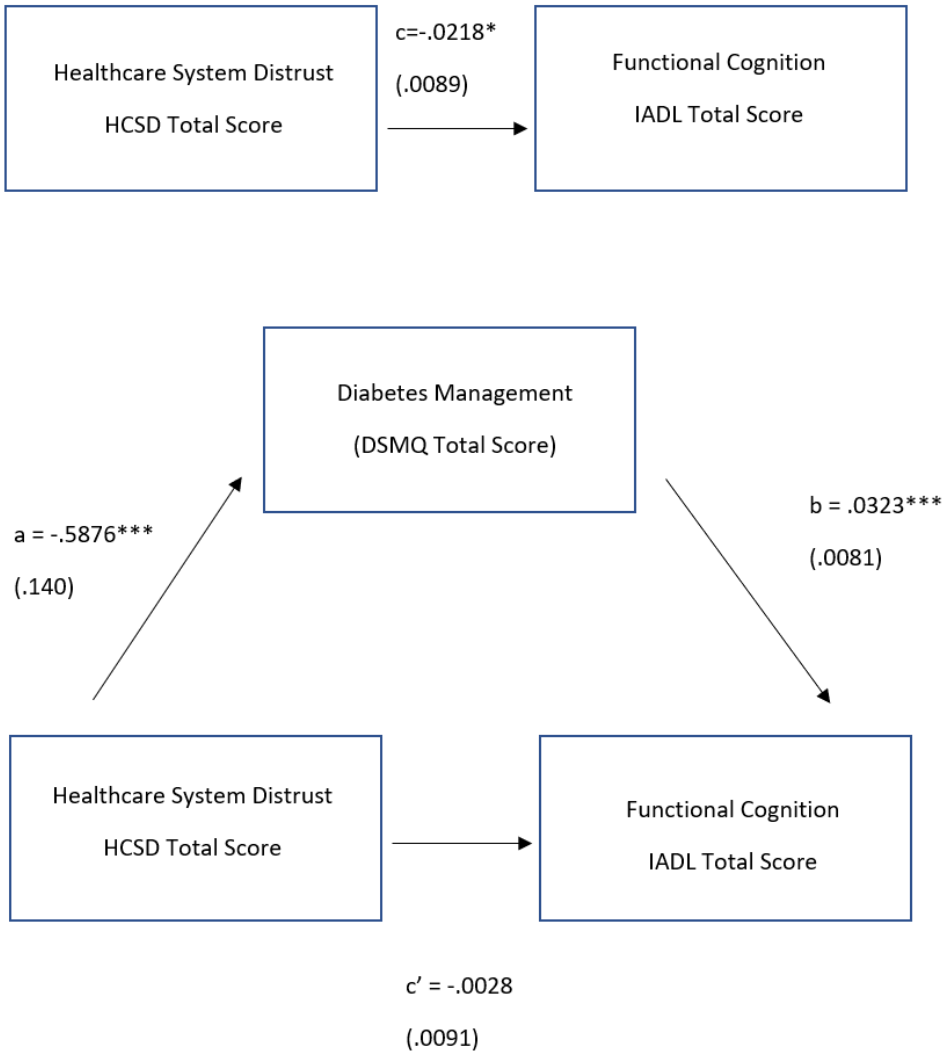
Table 6

Coefficients table for Mediation Analysis

Pathway	Unstandardized Coefficient		Standardized Coefficient
	B	Std. Error	Beta
C	-.0218	.0089	-.3414
A	-.5876	.1400	-.5262
B	.0323	.0081	.5640
c’	-.0028	.0091	-.0445

Figure 6

Mediation Model of Hypothesis Four



Note. $*p \leq .05$; $*** p \leq . .001$; Two outliers dropped from analysis; Pathways are represented with unstandardized coefficients; The standard error of each pathway is in parentheses.

CHAPTER 5

DISCUSSION

The purpose of this study was to uncover and explain the relationship between healthcare system distrust and cognition among African American older adults with T2DM. To our knowledge, this study was the first to assess the relationship between healthcare system distrust and cognition in any population. Overall results indicate that within this sample, aspects of cognition may be linked to healthcare system distrust.

Cognitive Ability and Healthcare System Distrust

Within this sample, there was no relationship between healthcare system distrust and cognitive ability. The lack of relationship between cognitive ability and healthcare system distrust in this study may be due to the way cognitive ability was assessed. Assessing cognitive ability over the phone was necessary during a pandemic. However, much of the research on cognitive ability in individuals with T2DM has been conducted in person (Awad et al., 2004; Mankovsky, 2018; Small et al., 2001; Sommerfield et al., 2004; Yeung et al., 2009). Before assuming there is no relationship between healthcare system distrust and cognitive ability, it is important for future researchers to assess the relationship between cognitive ability and healthcare system distrust in a more standardized way within a representative sample. Results from such research would better reveal, or rule out, any relationship between healthcare distrust and cognitive ability.

A second possible explanation for this finding comes from the finding that healthcare distrust and healthcare use are unrelated in this sample (See Table 4), and levels of heathcare use were generally high. Though individuals exhibited varying levels of distrust in the healthcare system, they may utilize healthcare and gain cognitive benefits from doing so. The

current understanding in the literature is that increased healthcare distrust results in reduced use of healthcare across an array of medical conditions (Musa et al., 2009; O'Malley et al., 2004). It is possible that this sample exhibited a group-serving bias based on the level of specificity measured in this study. We measured participant opinions at the healthcare system level, and not the level of trust in one's own provider. A lack of trust-worthiness may be attributed to an outside group (e.g., the healthcare system), but not to a member of the individual's own group (e.g., the individual's own doctor). (Pettigrew, 1979). These group-serving biases typically lead to more favorable evaluations of in-group actors (Hewstone & Jaspars, 1984). Individuals reported a variety of levels of distrust in the healthcare system, but rated their own healthcare access and quality as overall positive revealing a potential positive bias towards their own healthcare provider. This may account for the lack of a relationship between healthcare use and healthcare distrust. More research on group-serving biases in healthcare could provide a clearer understanding of why healthcare distrust was unrelated to healthcare use in this sample, and possible outside of this sample. Utilization of healthcare despite healthcare system distrust may buffer any impact distrust would have on cognitive ability.

Finally, demographic characteristics of this sample may also account for this finding. For instance, the sample was well educated when compared to national statistics for African American older adults (U.S. Department of Health and Human Services, 2018). Education and cognitive ability are typically highly correlated and increased education has been shown to slow the decline of cognitive abilities (Grønkjær et al., 2019; Parisi et al., 2012). Thus, impacts of healthcare system distrust may be buffered by high education in this sample.

Perceived Functional Cognition and Healthcare System Distrust

In this sample, healthcare system distrust was negatively related to perceived functional cognition, but not cognitive abilities. The effect size for the relationship between distrust and functional cognition was small (0.12). However, the effect size in this relationship was large (0.35) when diabetes management was added as to the model as a mediating variable. Perhaps healthcare distrust does not inhibit cognitive ability but is related to the other aspects of functional cognition such as cognitive style, habits, routines, or environmental factors. Future researchers should aim to uncover the role of these factors; increased understanding would help health providers to intervene when modifiable factors arise and educate patients about non-modifiable factors. These findings are the first to suggest that loss of functional cognition in African American older adults with T2DM may be ameliorated by addressing any barriers a potential distrust may cause. Healthcare systems and providers can work to dismantle distrust in healthcare by providing equitable care to African American older adults. They can work to target quality disparities in the healthcare system that facilitate distrust like those reviewed above. Specifically, healthcare systems can acknowledge and apologize for historical traumas, work to hire more diverse providers, and provide cultural training to all providers. Health providers can tailor interventions to the individual that are culturally relevant for that patient and can work to improve communication with their patients which can increase adherence (Campbell, & Quintiliani, 2006).

The IADL assessment is typically used to assess caregiver perceptions of a care recipient's functional cognition. We adapted the IADL in order to allow for the self-report of perceived functional cognition. The literature suggests self-report ratings of functional

cognition in older adults are typically higher than the ratings received when individuals are observed by healthcare providers (Kivela, 1984; Kuriansky et al., 1976; Wunderlich & National Research Council, 2009). This phenomenon has been shown in the IADL measure used in this study; individuals who self-report on the IADL have a tendency to overrate their abilities when compared to ratings of health providers, spouses, and caretakers (Edwards, 1990; Rubenstein et al., 1984). Like other self-report studies of functional cognition, our participants may have overrated their functional abilities. Most of our participants rated themselves as having the highest functional cognition possible. This resulted in ceiling effects on the IADL that limited the variability of the measure and the generalizability of these findings to this sample. The understanding in the current literature supports the notions that our findings on the IADL are likely overestimates. Thus, future research should assess functional cognition in a performance-based manner to assess the link between functional cognition and healthcare system distrust in a more accurate way.

Importantly, in this sample healthcare system distrust did not directly change an individual's perceived functional cognition. Instead, increased healthcare distrust reduced diabetes management which reduced perceived functional cognition. Our correlational data (see Table 4) may highlight the mechanisms which serve as catalysts for this relationship. In this sample healthcare system distrust is related to reduced dietary control, glucose management, and physical activity. These diabetes management behaviors may be the mechanisms which healthcare distrust indirectly impacts an individual's perceived functional cognition.

Further research should examine the relationship between healthcare distrust, glucose control, dietary control, and physical activity to better understand if healthcare distrust causes

the reduction of these diabetes management behaviors in this population. A better understanding of these relationships can motivate further development of cultural competence in health providers who are working with these patients, which can reduce the impact distrust may have on diabetes management and ameliorate changes in functional cognition. Declines in functional cognition often result in reduced ability to dress oneself, leave the home, remember important appointments, medications, or tasks, and reduce an individual's ability to age in place (Johnson & Lian, 2018). Often, reduced functional cognition results in moving to institutions for long term care, especially if the individual does not have the means to pay for health and social assistance (U.S. Department of Housing, 2013a; U.S. Department of Housing, 2013b; Mann, et. al., 2016). If healthcare system distrust is impacting functional cognition in African American older adults' lives it could be responsible for a quicker loss of independence in this population. Further research is needed to confirm that this relationship exists in other African American older adults with T2DM.

Replication of Earlier Findings

In addition to the novel findings described above, the present study replicated earlier findings that had been based on mostly White samples. The present findings provide healthcare providers working with African American older adults with more information to better serve their patients.

Healthcare Distrust and Diabetes Management

Individuals with higher distrust for healthcare systems reported less effective diabetes management. This finding supports the generalizability of previous findings linking healthcare distrust and health behaviors in other disease processes and populations, to African American older adults with T2DM. The historical and current institutional and

structural racism and discrimination that cultivate distrust, as discussed earlier in this paper, are likely related to diabetes management behaviors of African American older adults with T2DM. Because diabetes management is essential for overall health, wellness, and longevity it is important that this barrier is addressed (Awad et al., 2004; Nyenwe et al., 2011). Continuing to eliminate institutional and structural racism within the healthcare system is one step that may repair distrust. Additionally, educating health providers about the relationship between distrust and diabetes management is essential. Assessing for distrust in African American older adult patients with T2DM could also give providers more information about their patients and provide a pathway towards ameliorating the impact distrust may have on individuals' diabetes management behaviors.

Diabetes Management and Cognitive Functioning

Cognitive Ability. In this sample, performance on the cognitive ability task was not related to diabetes management. This is contrary to the current understanding of the relationship between cognitive ability and T2DM (Mankovsky et al., 2018). However, the present study was the first, to this researcher's knowledge, to assess for how T2DM impacts cognition in older African American adults. Aspects of the sample may help to explain why there is a lack of significance in this relationship. The sample's high education, physical and mental well-being, and high healthcare access and quality may have buffered the relationship between cognitive ability and diabetes management. Additionally, measuring cognitive ability over the phone may have influenced the results. To gain a better understanding of how cognition and diabetes management may be impacted by intersecting identities, more research should be conducted.

Perceived Functional Cognition. In this sample, higher perceived functional cognition was related to better diabetes management. However, ceiling effects limited the variability of the IADL measure, reducing the generalizability of findings. Therefore, the conclusions that can be drawn from this analysis are limited. Overall, this finding lends limited support to the generalizability of current literature that links diabetes management and cognitive functioning. More research on the impact diabetes management has on the functional cognition of African American older adults with T2DM could clarify this relationship and expand the generalizability of these findings.

It is still suggested that healthcare providers for older African Americans with T2DM assess each patient's diabetes management ability (i.e. can this patient exercise safely, eat healthily, and participate in diabetes treatment) and aid in problem-solving any barriers to diabetes management (Adu, Malabu et al., 2019; Fidan, et al., 2020). A large body of literature suggests that integrated care teams, which involve physical and behavioral health professionals to care for the whole person, are best suited to care for these patients (Nelson et al., 2018), in part by evaluating and addressing any barriers that impede diabetes management. In this way it may be possible to reduce diabetes' negative impacts on health and possibly reduce changes to functional cognition for African American older adults with T2DM. Thus integrated care models may allow providers to give higher quality physical *and* cognitive care.

The Role of Healthcare Use

Our correlational data (see Table 4) indicated that healthcare use is related to cognitive ability and functional cognition in African American older adults with T2DM. These findings point to another important line of research related to healthcare use. Reduced healthcare use could result in missed cognitive diagnoses or treatments. Alternatively, reduced cognitive functioning may cause individuals to use healthcare services at lower rates. A better understanding of this relationship might allow healthcare systems to better serve patients who present with cognitive decline. If this relationship is supported with future research, providers could better understand and explain to patients, the importance of healthcare use for their cognition. Knowing more about the relationship between healthcare use and cognition may also lead the way for greater community outreach to reach patients with cognitive decline who may not be using health services.

Limitations

This study has many strengths but there are also a few limitations to note. First, although the sample was recruited outside of health centers in an attempt to include people with more variability in level of healthcare distrust, our snowball sampling methods may have limited that variability. The sample was predominately female, well educated, and had a high perception of healthcare access and quality; therefore this study's findings should be generalized with caution.

There are also measurement-based limitations to note. Some demographic questions were framed in a way that may have influenced responses. Specifically, data about religion could not be reported due to the lack of adequate response categories presented to

participants. Additionally, the data regarding comorbid health concerns is likely an underestimate due to the way this question was framed . This question was asked as a categorical question (e.g. cardiovascular, cancer, other) using language that may not have been familiar to participants. For example, participants may not have understood that high blood pressure was a cardiovascular concern. In addition, although a write-in option was provided, most participants did not disclose any co-morbid medical conditions. or may have simply chosen not to disclose other health concerns. Another limitation is the observed ceiling effects on the IADL measure, limiting the generalizability of findings reported here to the present sample. Additionally, our analyses assume an interval measurement scale on the IADL when it is more likely an ordinal scale. Thus our analyses are at an increases risk of type II errors, potentially causing a false positive in significance testing.

Future Studies

This study is the first to uncover a relationship between healthcare distrust and cognitive outcomes in older African American adults with T2DM. Uncovering this relationship provides health systems and providers with new information and impetus to address medical distrust in their healthcare practices. Future studies should continue to examine individual, cultural, and societal factors that may contribute to this relationship. In particular, exploring this relationship within different races, ethnicities, and SES statuses could be a rich avenue for future researchers to pursue, as well as an avenue for providers to better understand and serve their patients. Additionally, further exploration of the relationship between functional cognition and healthcare distrust with standardized measures will better fill gaps in the current literature.

Conclusion

This study sought to better understand cognitive risks for African American older adults with T2DM by investigating the impact healthcare distrust may have on cognition. We successfully replicated findings from previous literature within African American older adults with T2DM. We observed the negative relationship between healthcare distrust and health behaviors and the positive relationship between diabetes management and functional cognition. Additionally, we found that healthcare distrust and functional cognition were related within our sample of older African Americans with T2DM, and this relationship was explained by diabetes management. The findings of this study can provide researchers and medical providers with information on the cognitive implications of health care system distrust in African American older adults. Healthcare system distrust may be an important area for provider intervention on functional cognitive decline in older African American adults with T2DM. Findings suggest diabetes management interventions need to be conducted in an integrated health care approach, including physical, mental, cognitive, and social care to improve outcomes for the African American older adult T2DM population.

APPENDIX A

RECRUITEMENT FLYER

APPENDIX B

MEASURES

Demographic Questionnaire

What is your age: _____

How long have you been diagnosed by a medical professional with T2DM (circle one):

1 year or less	2-3 years	4-5 years	6-7 years
8-9 years	10-15 years	16-20 years	21+ years

Do you have any neurological disorders such as previous stroke, serious head injury, or Mild Neurocognitive or Major Neurocognitive disorder (dementia)? _____

Do you have any other health conditions (Circle one): None Cardiovascular Cancer Other

If other what: _____

What was your sex at birth (circle one): Male Female Other

What is your expressed gender (circle one): Male Female non-binary Other

What is your race (circle one):

African American or Black African American/Black & Another Race Other

What is your average yearly income:

$10,000 or less	$10,001-$30,000	$30,001 - $50,000	50,001 – $80,000
$80,0001-$100,000		$100,000+	Prefer not to respond

*What is your highest level of education (in years):*_____

Do you rent or own your home (circle one):

Do you have a religious affiliation (circle one): Christian Muslim Judaism Other None

On a scale of 1 to 10, how would you rate your access to healthcare with 1 being no access and 10 being complete access: _____

On a scale of 1 to 10, how would you rate the quality of healthcare that is accessible to you with 1 being bad quality and 10 being great quality: ____

TICS Script

I'm going to ask you some questions to test your memory. Some of these are likely to be easy for you, but some may be difficult.

Please bear with me and try to answer all the questions the best you can. If you can't answer a question, don't worry. Just try your best.

You will not need to write anything down because this is a test of your memory.

Some of the things on this test I can repeat and others I cannot. Do you have any questions for me before we begin?

- Researcher reads the TICS questions verbatim.

The Patient Health Questionnaire (PHQ-9)

Patient Name _____ Date of Visit _____

Over the past 2 weeks, how often have you been bothered by any of the following problems?	Not At all	Several Days	More Than Half the Days	Nearly Every Day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling asleep, staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself - or that you're a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or, the opposite - being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

Column Totals _____ + _____ + _____

Add Totals Together _____

10. If you checked off any problems, how difficult have those problems made it for you to Do your work, take care of things at home, or get along with other people?

☐ Not difficult at all ☐ Somewhat difficult ☐ Very difficult ☐ Extremely difficult

Beck Anxiety Inventory

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom.

	Not At All	Mildly but it didn't bother me much.	Moderately - it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding/racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3
Hands trembling	0	1	2	3
Shaky / unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint / lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot/cold sweats	0	1	2	3
Column Sum				

Scoring **-** Sum each column. Then sum the column totals to achieve a grand score. Write that score here _____ .

Interpretation

A grand sum between **0 – 21** indicates very low anxiety. That is usually a good thing. However, it is possible that you might be unrealistic in either your assessment which would be denial or that you have learned to "mask" the symptoms commonly associated with anxiety. Too little "anxiety" could indicate that you are detached from yourself, others, or your environment.

A grand sum between **22 – 35** indicates moderate anxiety. Your body is trying to tell you something. Look for patterns as to when and why you experience the symptoms described above. For example, if it occurs prior to public speaking and your job requires a lot of presentations you may want to find ways to calm yourself before speaking or let others do some of the presentations. You may have some conflict issues that need to be resolved. Clearly, it is not "panic" time but you want to find ways to manage the stress you feel.

A grand sum that **exceeds 36** is a potential cause for concern. Again, look for patterns or times when you tend to feel the symptoms you have circled. Persistent and high anxiety is not a sign of personal weakness or failure. It is, however, something that needs to be proactively treated or there could be significant impacts to you mentally and physically. You may want to consult a counselor if the feelings persist.

Instrumental Activities of Daily Living Scale (revised)

Say: Next I am going to ask you some questions about your daily living ability.

A. Which of the following options sounds closest to your actual ability to use the phone?
   1. **You operate the phone on your own initiative, looking up and dialing numbers on your own**
   2. **You can dial a few well known numbers**
   3. **You answer the telephone but do not dial the telephone**
   4. You do not use the telephone at all

B. Which of the following options sounds closest to your actual ability to shop?
   1. **You take care of all shopping needs independently**
   2. You shop in dependently for small purchases only
   3. You need to be accompanied on any shopping trip
   4. You are completely unable to shop

C. Which of the following options sounds closest to your actual ability to prepare food?
   1. **You plan, prepare, and serve adequate meals in dependently**
   2. You can prepare adequate meals if supplied with ingredients
   3. You can heat, serve, and prepare meals OR can prepare meals but do not maintain an adequate diet
   4. You need to have meals prepared and served to you

D. Which of the following options sounds closest to your actual ability to perform housekeeping tasks?
   1. **You maintain the house alone or with occasional assistance for heavy tasks**
   2. **You performed light daily tasks such as dishwashing or making the bed**
   3. **You perform like daily tasks but cannot maintain acceptable cleanliness**
   4. **You need help with all home maintenance tasks**
   5. You do not participate in any housekeeping tasks

E. Which of the following options sounds closest to your actual ability to do laundry?
   1. **You do personal laundry completely**
   2. **You launder small items such as stockings or delicates**
   3. You are unable to do your own laundry

F. Which of the following options sounds closest to your current transportation method?
   1. **You travel independently on public transportation or by driving your own car**
   2. **You arrange your own travel via taxi but do not otherwise use public transportation**
   3. **You travel on public transportation when accompanied by another**
   4. You travel in taxi or car with assistance of another
   5. You do not travel at all

G. Which of the following options sounds closest to your actual ability to take medication?
   1. **You are responsible for taking medication incorrect doses at the correct time**
   2. You are responsible for taking medication if prepared in advance for you
   3. You are not capable of dispensing and taking your own medication

H. Which of the following options sounds closest to your actual ability to handle finances?
   1. **You manage financial matters independently, collecting and tracking income**
   2. **You manage day-to-day purchases, but need help with banking or major purchases**
   3. You are not capable of handling finances

Scoring: Bolded responses receive 1 point

Healthcare System Distrust Scale

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The Health Care System does its best to make patients' health better	5	4	3	2	1
The Health Care System covers up its mistakes	1	2	3	4	5
Patients receive high quality medical care from the Health Care System	5	4	3	2	1
The Health Care System makes too many mistakes	1	2	3	4	5
The Health Care System puts making money above patients' needs	1	2	3	4	5
The Health Care System gives excellent medical care	5	4	3	2	1
Patients get the same medical treatment from the Health Care System, no matter what the patient's race or ethnicity	5	4	3	2	1
The Health Care System lies to make money	1	2	3	4	5
The Health Care System experiments on patients without them knowing	1	2	3	4	5

*Shaded questions are part of the competence subscale and non-shaded questions are part of the values subscale.

Diabetes Self-Management Questionnaire

The following statements describe self-care activities related to your diabetes. Thinking about your self-care over the last 8 weeks, please specify the extent to which each statement applies to you.	Applies to me very much	Applies to me to a consider-able degree	Applies to me to some degree	Does not apply to me
1. I check my blood sugar levels with care and attention. ☐ *Blood sugar measurement is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
2. The food I choose to eat makes it easy to achieve optimal blood sugar levels.	☐3	☐2	☐1	☐0
3. I keep all doctors' appointments recommended for my diabetes treatment.	☐3	☐2	☐1	☐0
4. I take my diabetes medication (e. g. insulin, tablets) as prescribed. ☐ *Diabetes medication / insulin is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
5. Occasionally I eat lots of sweets or other foods rich in carbohydrates.	☐3	☐2	☐1	☐0
6. I record my blood sugar levels regularly (or analyse the value chart with my blood glucose meter). ☐ *Blood sugar measurement is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
7. I tend to avoid diabetes-related doctors' appointments.	☐3	☐2	☐1	☐0
8. I do regular physical activity to achieve optimal blood sugar levels.	☐3	☐2	☐1	☐0
9. I strictly follow the dietary recommendations given by my doctor or diabetes specialist.	☐3	☐2	☐1	☐0
10. I do not check my blood sugar levels frequently enough as would be required for achieving good blood glucose control. ☐ *Blood sugar measurement is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
11. I avoid physical activity, although it would improve my diabetes.	☐3	☐2	☐1	☐0
12. I tend to forget to take or skip my diabetes medication (e. g. insulin, tablets). ☐ *Diabetes medication / insulin is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
13. Sometimes I have real 'food binges' (not triggered by hypoglycaemia).	☐3	☐2	☐1	☐0
14. Regarding my diabetes care, I should see my medical practitioner(s) more often.	☐3	☐2	☐1	☐0
15. I tend to skip planned physical activity.	☐3	☐2	☐1	☐0
16. My diabetes self-care is poor.	☐3	☐2	☐1	☐0

REFERENCES

Abate, M., Schiavone, C., Pelotti, P., & Salini, V. (2010). Limited joint mobility in diabetes and aging: recent advances in pathogenesis and therapy. *International Journal of Immunopathology and Pharmacology, 23,* 997–1003

Adams, A.S., Zhang F., Mah, C., (2005). Race differences in long-term diabetes management in an HMO. *Diabetes Care, 28*(12):2844–2849.

Adu, M. D., Malabu, U. H., Malau-Aduli, A., & Malau-Aduli, B. S. (2019). Enablers and barriers to effective diabetes self-management: A multi-national investigation. *PloS one, 14*(6), e0217771. https://doi.org/10.1371/journal.pone.0217771

Agency for Healthcare Quality and Research. (2019). 2018 *National quality & disparities report*. Rockville, MD. https://www.ahrq.gov/sites/default/files/wysiwyg/research/findings/nhqrdr/2018qdr.pdf

Ahn, S., & Song, R. (2012). Effects of tai chi exercise on glucose control, neuropathy scores, balance, and quality of life in patients with type 2 diabetes and neuropathy. *Journal of Alternative Complementary Medicine,18,*1172–1178

Alexopoulos, G., Meyers, B., Young, R., Kalayam, B., & Kakuma, T. (2005). Executive dysfunction and long-term outcomes of geriatric depression. *Archives of General Psychiatry, 57,* 285-290.

American Diabetes Association. (2007). Diabetes management in correctional institutions. *Diabetes Care, 30*(Supp 1), S77–84.

American Diabetes Association. (2018). *Statistics about diabetes*. Retrieved from https://www.diabetes.org/resources/statistics/statistics-about-diabetes

American Diabetes Association. (2020). *The cost of diabetes*. Retrieved from https://www.diabetes.org/resources/statistics/cost-diabetes

American Psychological Association. (2002). *Guidelines on multicultural education, training, research, practice, and organizational change for psychologists.* Retrieved from http://www.apa.org/pi/oema/resources/policy/provider-guidelines.aspx

American Psychological Association. (2012). Guidelines for the evaluation of dementia and age-related cognitive change. *American Psychologist, 67*(1), 1–9. https://doi.org/10.1037/a0024643

American Psychological Association. (2013). *Guidelines for practice with older adults.* Washington, DC

American Psychological Association. (2017). *Multicultural guidelines: An ecological approach to context, identity, and intersectionality*. Retrieved from http://www.apa.org/about/policy/multicultural-guidelines.pdf

American Psychological Association. (2019). *APA guidelines on race and ethnicity in psychology*. Washington, DC

Anderson. L. (1990). Health-care communication and correlates of adherence in diabetes management. *Diabetes Care, 13*(2), 66-76.

Armstrong, K., Putt, M., Halbert, C., Grande, D., Schwartz, J. S., Liao, K., Marcus, N., Demeter, M. B., & Shea. J. (2012). The influence of health care policies and health care system distrust on willingness to undergo genetic testing. *Medical Care, 50*(5), 381.

Armstrong, K., Ravenell, K. L., McMurphy, S., & Putt, M. (2007). Racial/ethnic differences in physician distrust in the United States. *American Journal of Public Health*, *97*(7), 1283–1289. https://doi.org/10.2105/AJPH.2005.080762

Armstrong, K., Rose, A., Peters, N., Long, J. A., McMurphy, S., & Shea, J. A. (2006). Distrust of the health care system and self-reported health in the United States. *Journal of General Internal Medicine*, *21*(4), 292–297. https://doi.org/10.1111/j.1525-1497.2006.00396.x

Asku, I., Ates, B., Baykara, B., Kiray, M. Sisman, A., Buyuk, E., Baykara, B., Cetinkaya, C., Gumus, H., & Uysal, N. (2012). Anxiety correlates to decreased blood and prefrontal cortex IFG-1 levels in streptozotocin-induced diabetes. *Neuroscience Letters, 531,* 176-171.

Awad, N, Gagnon, M., & Messier, C. (2004). The relationship between impaired glucose tolerance, type two diabetes, and cognitive function. *Journal of Clinical and Experimental Neuropsychology, 26*:8, 1044-1080, DOI: 10.1080/13803390490514875

Axelrod, R. (1984). *The evolution of cooperation. (Rev. ed*.). Basic Books.

Balkrishnan, R., Dugan E., Camacho F. T., & Hall, M. A. (2003). Trust and satisfaction with physicians, insurers, and the medical profession. *Medical Care, 41,* 1058–64.

Beck, A.T., Epstein, N., Brown, G., & Steer, R.A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56,* 893-897.

Berchick, E., Barnett, J., & Upton, R. (2019). Health insurance coverage in the United States: 2018. *Current Populations Report,* Report Number p60-267(RV). U.S. Census Bureau. https://www.cencus.gov/library/publications/2019/demo/p60-267.html

Bies, R. J., Barclay, L. J., Saldanha, M. F., Kay, A. A., and Tripp, T. M. (2018). Trust and distrust. their interplay with forgiveness in organizations, in R.H. Searle, A.M.I. Nienaber, & S. B. Sitkin (Eds)., *The Routledge companion to trust* (pp. 302-325). Routledge.

Biessels, G.J., & Reijmer, Y.D. (2014). Brain changes underlying cognitive dysfunction in diabetes: what can we learn from MRI? *Diabetes, 63,* 2244–2252.

Bijlsma-Frankema, K., & Sitkin, S.B., & Weibel A (2015) Distrust in the balance: The emergence and development of intergroup distrust in a court of law. *Organic Science, 26*, 1018–1039.

Bohnet, I., & Meier, S. (2005) *Deciding to distrust*. Faculty Research Working Papers Series, Harvard University, John F. Kennedy School of Government, KSG Working Paper No. RWP05-049; FRB Boston Working Paper No. 05-4. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=839225

Brandt, J., Spencer, M., & Folstein, M. (1998). The Telephone Interview for Cognitive Status. *Neuropsychiatry Neuropsychological Behavior, 1,* 111-117

Browne, J. L., Ventura, A., Mosely, K., & Speight, J. (2014). 'I'm not a druggie, I'm just a diabetic': A qualitative study of stigma from the perspective of adults with type 1 diabetes. *British Medical Journal, 4*(7). doi:10.1136/bmjopen-2014-005625

Bureau of Labor Statistics (2019). *Annual averages: Bureau of Labor Statistics – 25 years or older: 2018 Census Bureau American Community Survey.* Retrieved from https://www.bls.gov/cps/tables.htm

Campbell, M. K., & Quintiliani, L. M. (2006). Tailored interventions in public health: Where does tailoring fit in interventions to reduce health disparities? *American Behavioral Scientist, 49*(6), 775–793. https://doi.org/10.1177/0002764205283807

Center for Disease Control and Prevention. (2020). N*ational diabetes statistics report, 2020*. U.S. Dept of Health and Human Services. Retrieved from https://www.cdc.gov/diabetes/data/statistics-report/index.html

Chapman, L.K., & Woodruff-Borden, J. (2009). The impact of family functioning on anxiety symptoms in African American and European young adults. *Personality and Individual Differences 47,* 583–589.

Chun Fat, S., Herrera-Escobar, J. P., Seshadri, A. J., Al Rafai, S. S., Hashmi, Z. G., de Jager, E., Velmahos, C., Kasotakis, G., Velmahos, G., Salim, A., Haider, A., & Nehra, D. (2019). Racial disparities in post-discharge healthcare utilization after trauma. *The American Journal of Surgery, 218*(5), 842-846.

Clement, S., Braithwaite, S.S., & Magee, M.F. (2004). Management of diabetes and hyperglycemia in hospitals. *Diabetes Care, 27*, 553–97.

Cooper, M. (2014). Disparities in care for depression among primary care patients. *Journal of General Internal Medicine,19,* 120–126

Copeland, L., Zeber, J., & Blow, F. (2003) Racial disparity in the use of atypical antipsychotic medication among veterans. *American Journal of Psychiatry, 160*(10), 1817-1822.

Corbie-Smith, G., Thomas, S. B., & St George, D. M. (2002). Distrust, race, and research. *Archives of Internal Medicine,162,* 2458–63.

Darke, P. R., & Ritchie, R. (2007) The defensive consumer: Advertising deception, defensive processing, and distrust. *Journal of Marketing Research, 44*, 114–127.

Deutsch, M. (1958). Trust and suspicion. *Journal of Conflict Resolution, 2*, 265–279. doi: 10.1177/00220027580020040

Diabetes Prevention Program. (2013). *Diabetes prevention program protocol*. Retrieved from http://www.bsc.gwu.edu/DPP/protocol.htmlvdoc.

Diabetes Research Connection. (2016). *Differences between type 1 and type 2 diabetes.* Retrieved from https://diabetesresearchconnection.org/differences-type-1-type-2-diabetes/.

Dubé, J. J., Amati, F., & Toledo, F.G. (2011). Effects of weight loss and exercise on insulin resistance, and intramyocellular triacylglycerol, diacylglycerol and ceramide. *Diabetologia, 54*, 1147–1156.

Eack, S., Bahorik, A., Newhill, C., Neighbors, H., & Davis, L. (2013). Interviewer perceived honesty mediates racial disparities in the diagnosis of schizophrenia. *Psychiatric Services*, *63*(9), 875-880.

Edwards, M. M. (1990). The reliability and validity of self-report activities of daily living scales. *Canadian Journal of Occupational Therapy, 57*(5), 273–278.

Ellish, N., Scott, D., Royak-Schaler, R., & Higginbotham, E. (2009). Community-based strategies for recruiting older adult African Americans into a behavioral intervention study. *Journal of the National Medical Association, 101*(11), 1104-1111.

Fidan, Ö., Takmak, Ş., Zeyrek, A., & Kartal, A. (2020). Patients with type 2 diabetes mellitus: Obstacles in coping. *Journal of Nursing Research, 28*(4), e105.

Friestad, M., & Wright, P. (1994) The persuasion knowledge model: How people cope with persuasion attempts. *Journal of Consumer Research, 21*, 1–31.

Gallagher, N. A., Gretebeck, K. A., Robinson, J. C., Torres, E. R., Murphy, S. L., & Martyn, K. K. (2010). Neighborhood factors relevant for walking in older, urban, African American adults. *Journal of Aging and Physical Activity*, *18*(1), 99–115. https://doi.org/10.1123/japa.18.1.99

Garber, C. E., Blissmer, B., & Deschenes, M. R. (2011). Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Medical Science Sports Exercise, 43:*1334–1359.

Garber, A., Abrahamson, M., Barzilay, J., Blonde, L., Bloomgarden, Z., Bush, M., Dagogo-Jack, S., & DeFronzo, R. Einhorn, D., Fonseca, V., Garber, J., Garvey, T., Grunberger, G., Handelsman, Y., Hirsch I., Jellinger, P., McGill, J., Mechanick, J., Rosenblit, P., & Umpierrez, G. (2019). Consensus statement by the American association of clinical endocrinologists and American college of endocrinology on the comprehensive type 2 diabetes management algorithm – 2019 executive summary. *Endocrine Practice*, *25*(1), 69-100. https://doi.org/10.4158/CS-2018-0535

Giles, G. M., Edwards, D. F., Morrison, M. T., Baum, C., & Wolf, T. J. (2017). Screening for functional cognition in postacute care and the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014. *American Journal of Occupational Therapy, 71,*(5). doi.org/10.5014/ajot.2017.715001

Goold, S. (2002). Trust, distrust and trustworthiness. *Journal of Internal Medicine, 17*(1), 79-81.

Gordon, B. A., Benson, A. C., Bird, S. R., & Fraser, S. F. (2009) Resistance training improves metabolic health in type 2 diabetes: A systematic review. *Diabetes Research in Clinical Practice, 83*, 157–175.

Grønkjær, M., Osler, M., Flensborg-Madsen, T., Sørensen, H. J., & Mortensen, E. L. (2019). Associations between education and age-related cognitive changes from early adulthood to late midlife. *Psychology and Aging, 34*(2), 177–186.

Guo S. L., Lumineau, F., & Lewicki, R. J. (2017). Revisiting the foundations of organizational distrust. *Foundations and Trends in Management,* (1), 1–88.

Hajimonfared, M., Ostovar, M., & Heidery, M. (2016). Diabetes and depression: from Iranian traditional medicine to modern literature. *Iranian Journal of Medical Sciences, 41*(3 Suppl), S28.

Halbert, C. H., Armstrong, K., Gandy, O. H., & Shaker, L. (2006). Racial differences in trust in health care providers. *Archives of Internal Medicine, 166*(8), 896–901. doi: 10.1001/archinte.166.8.896.

Hall, L. N., Ficker, L. J., Chadiha, L. A., Green, C. R., Jackson, J. S., & Lichtenberg, P. A. (2016). Promoting retention: African American older adults in a research volunteer registry. *Gerontology and Geriatric Medicine*. https://doi.org/10.1177/2333721416677469

Haas, L., Maryniuk, M., Beck, J., Cox, C. E., Duker, P., Edwards, L., Fisher, E., Hanson, L., Kent, D., Kolb, L., McLaughlin, S., Orzeck, E., Piette, J. D., Rhinehart, A. S., Rothman, R., Sklaroff, S., Tomky, D., & Youssef, G. (2012). National standards for diabetes self-management education and support. *Diabetes Education, 38*(5), 619-29.

Hardin, R. (2004). *Distrust*. Russel Sage Foundation. Retrieved from https://www.russellsage.org/publications/distrust-0

Hardin R., & Hardin R. (2004) *Distrust: Manifestations and management.* Russell Sage Foundation, 3–33.

Hatzenbuehler, M., Phelan, J., & Link, B. (2013). Stigma as a fundamental cause of population health inequalities. *American Journal of Public Health, 103*(5), 813-821.

Heisler, M., Faul, J. D., Hayward, R.A., Langa, K.M., Blaum, C., & Weir, D. (2007). Mechanisms for racial and ethnic disparities in glycemic control in middle-aged and older Americans in the health and retirement study. *Archives of Internal Medicine,167*(17), 1853–1860.

Hewstone, M., & Jaspars, J. (1984). Social dimensions of attribution. *European Developments in Social Psychology, 12*(3), 380-404.

Hilmers, A., Hilmers, D. C., & Dave, J. (2012). Neighborhood disparities in access to healthy foods and their effects on environmental justice. *American Journal of Public Health, 102*(9), 1644-1654.

Hoffman, K. M., Trawalter, S., Axt, J. R., & Oliver, M. N. (2016). Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between Blacks and Whites. *Proceedings of the National Academy of*

Sciences of the United States of America, *113*(16), 4296–4301. https://doi.org/10.1073/pnas.1516047113

Huang, F., Chung, H., Kroenke, K., Delucchi, K., & Spritzer, R. L. (2006). Using the PHQ-9 to measure depression among racially and ethnically diverse primary care patients. *Journal of General Internal Medicine, 21,* 547-552.

Hughes, T. M., Sink, K. M., Williamson, J. D., Hugenschmidt, C. E., Wagner, B. C., Whitlow, C. T., Xu, J., Smith, S. C., Launer, L. J., Barzilay, J. I., Ismail-Beigi, F., Bryan, R. N., Hsu, F. C., Bowden, D. W., Maldjian, J. A., Divers, J., Freedman, B. I., & AA-DHS MIND and ACCORD MIND Investigators (2018). Relationships between cerebral structure and cognitive function in African Americans with type 2 diabetes. *Journal of Diabetes and its Complications*, *32*(10), 916–921. https://doi.org/10.1016/j.jdiacomp.2018.05.017

Im, E.-O., Ko, Y., Hwang, H., Yoo, K. H., Chee, W., Stuifbergen, A., Walker, L., Brown, A., McPeek, C., & Chee, E. (2012). Physical activity as a luxury: African American women's attitudes toward physical activity. *Western Journal of Nursing Research, 34*(3), 317–339. https://doi.org/10.1177/0193945911400637

Johnson, J. H., & Lian, H. (2018). Vulnerable African American seniors: The challenges of aging in place. *Journal of Housing for the Elderly,32*, 135-159.

Karve, S., Balkrishan, R., Mohammad, Y., & Levine, D. (2011). Racial/Ethnic disparities in emergency department waiting time for stroke in the United States. *Journal of Stroke and Cerebrovascular Disorders, 20*(1), 30-40.

Keating, N. L., Green, D. C., Kao, A. C., Gazmararian, J. A., & Wu, V. Y. (2002). How are patients' specific ambulatory care experiences related to trust, satisfaction, and considering changing physicians? *Journal of General Internal Medicine, 17*, 29–39.

Kelly, D., Dixon, L., Kreyenbuhl, J., Medoff, D., Lehman, A., Love, R., Brown, C., & Conley R. (2006). Clozapine utilization and outcomes by race in a public mental health system: 1994-2000. *Journal of Clinical Psychiatry, 67*(9):1404-1411.

Kennedy, B., Mathis, C., & Woods, A. (2007). African Americans and their distrust of the healthcare system: Healthcare for diverse populations. *Journal of Cultural Diversity, 14*(2), 56-60.

Kenny, S. (2015). Power, opportunism, racism: Human experiments under American slavery. *Endeavor, 39*(1), 10-20.

Khan, Z. D., Lutale, J., & Moledina, S. M. (2019). Prevalence of depression and associated factors among diabetic patients in an outpatient diabetes clinic. *Psychiatry Journal*, 2083196, https://doi.org/10.1155/2019/2083196

Kirmani, A., & Zhu, R. (2007) Vigilant against manipulation: The effect of regulatory focus on the use of persuasion knowledge. *Journal of Marketing Research 44*, 688–701.

Kirwan, J. P., Solomon, T. P., Wojta, D. M., Staten, M. A., & Holloszy, J. O. (2009). Effects of 7 days of exercise training on insulin sensitivity and responsiveness in type 2 diabetes mellitus. *American Journal of Physiological Endocrinology Metabolism, 297,* E151–E156.

Kivela, S. L. (1984). Measuring disability-do self-ratings and service provider ratings compare? *Journal of Chronic Diseases, 37*(2), 115-123.

Kohl, H. W., Craig, C. L., & Lambert, E. V. (2012). The pandemic of physical inactivity: Global action for public health. *Lancet, 380*(9838), 294–305.

Koss, C. S., & Baker, T. A. (2017). A question of trust: Does mistrust or perceived discrimination account for race disparities in advance directive completion? *Innovation in aging, 1*(1), igx017. https://doi.org/10.1093/geroni/igx017

Kramer, R. M. (1994) The sinister attribution error: Paranoid cognition and collective distrust in organizations. *Motivation and Emotion, 18*, 199–230.

Kulik, A., Shrank, W., Levin, R., & Choudhry, N.K. (2011). Adherence to statin therapy in elderly patients after hospitalization for coronary revascularization. *American Journal of Cardiology, 107*(10), 409–414.

Kuriansky, J. B., Gurland, B. J., Fleiss, J. L., & Cowan, D. (1976). The assessment of self-care capacity in geriatric psychiatric patients by objective and subjective methods. *Journal of Clinical Psychology, 32*(1), 95–102.

LaVeist, T. A., Isaac, L. A., & Williams, K. P. (2009). Mistrust of health care organizations is associated with underutilization of health services. *Health Services Research, 44*(6), 2093–2105. https://doi.org/10.1111/j.1475-6773.2009.01017.x

Lawton, M. P., & Brody, E. M. (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. *The Gerontologist, 9*(3), 179-186.

Lewicki, R. J., & Bunker, B. B. (1996) Developing and maintaining trust in work relationships. In: R. M. Kramer, and T. R. Tyler (Eds.), *Trust in organizations: Frontiers in theory and research.* (pp. 14-139). Sage Publications. http://dx.doi.org/10.4135/9781452243610.n7

Lewicki, R. J., Daniel, J., McAllister, D. J., & Bies, R. J. (1998). Trust and distrust: New relationships and realities. *Academy of Management Review, 23,* 438–458. doi: 10.5465/amr.1998.926620

Lewicki, R. J., Tomlinson, E. C., & Gillespie, N. (2006). Models of interpersonal trust development: Theoretical approaches, empirical evidence, and future directions. *Journal of Management Studies, 32*, 991–1022. doi: 10.1177/0149206306294405

Lewis, L., & Schrader, C. (2013). Racial disparities in emergency triage. *Journal of Emergency Medicine, 44*(2), 511-518.

Li, C., Barker, L., Ford, E. S., Zhang, X., Strine, T. W., & Mokdad, A. H. (2008). Diabetes and anxiety in US adults: findings from the 2006 Behavioral Risk Factor Surveillance System. *Diabetic Medicine: A Journal of the British Diabetic Association, 25*(7), 878–881. https://doi.org/10.1111/j.1464

Lindeberg, S., Jönsson, T., Granfeldt, Y., Borgstrand, E., Soffman, J., & Sjöström, K. (2007). A Palaeolithic diet improves glucose tolerance more than a Mediterranean-like diet in individuals with ischaemic heart disease. *Diabetologia, 50,* 1795–807.

Lovejoy, J. C., Windhauser, M. M., Rood, J. C., De la Bretonne, J.A. (1998) Effect of a controlled high-fat versus low-fat diet on insulin sensitivity and leptin levels in African-American and Caucasian women. *Metabolism, 47*, 1520–1524.

Lumineau, F. (2017) How contracts influence trust and distrust. *Journal of Management Studies, 43,* 1553–1577.

Mankovsky, B., Zherdova, N., Van den Berg, E., Biessels, G. J., & de Bresser, J. (2018). Cognitive functioning and structural brain abnormalities in people with type 2

diabetes mellitus. *Diabetic Medicine: A Journal of the British Diabetic Association*, *35*(12), 1663–1670. https://doi.org/10.1111/dme.13800

Manly, J., Schupf, N., Stern, Y., Brickman, A., Tang, M., & Mayeux, R. (2011). Telephone-based identification of mild cognitive impairment and dementia in a multicultural cohort. *Archives of Neurology, 68*(5), 607-614.

Mann, C., Raphael, C., Anthony, S., & Nevitt, K. (2016). Securing the safety net for America's vulnerable populations. *Generations, 40*(4), 50–57.

Mechanic, D. (1998). The functions and limitations of trust in the provision of medical care. *Journal of Health Politics, Policy and Law, 23*(4), 661-686.

Miu, A., Heilman, R., & Houser, D. (2007). Anxiety impairs decision making: Psychophysiological evidence from an Iowa Gambling Task. *Biological Psychology, 77,* 353-358.

Moghissi, E. S., Korytkowski, M. T., & DiNardo, M. (2009). American Association of Clinical Endocrinologists and American Diabetes Association consensus statement on inpatient glycemic control. *Diabetes Care, 32*, 1119–1131.

Morimoto, S., Gunning, F., Murphy C., Kanellopoulos, D., & Klimastra, S. (2011). Semantic organizational strategy predicts verbal memory and remission rate of geriatric depression. *International Journal of Geriatric Psychiatry, 27*(5), 506–512. https://doi.org/10.1002/gps.2743

Morley, J. E., Morris, J. C., Berg-Weger, M., Borson, S., Carpenter, B. D., Del Campo, N., Dubois, B., & Vellas, B. (2015). Brain health: The importance of recognizing

cognitive impairment: an IAGG consensus conference. *Journal of the American Medical Directors Association*, *16*(9), 731–739. https://doi.org/10.1016/j.jamda.2015.06.017

Murdock, K., LeRoy, A., Lacourt, T., Duke, D., Heijnen, C., & Fagundes, C. (2017). Executive functioning and diabetes: The role of anxious arousal and inflammation. *Psychoneuroendocrinology, 71,* 102-109.

Musa, D., Schulz, R., Harris, R., Silverman, M., & Thomas, S. (2009). Trust in the health care system and the use of preventive health services by older Black and White adults. *American Journal of Public Health, 99*(7), 1293–1299. https://doi.org/10.2105/AJPH.2007.123927

Nam, S., Chesla, C., Stotts, N., Kroon, L., & Janson, S. (2011). Barriers to diabetes management: Patient and provider factors. *Diabetes Research and Clinical Practice, 93*(1), 1-9.

NAACP. (2020). *Walking while Black.* Retrieved from https://www.propublica.org/series/walking-while-black

National Institute of Environmental Health Services. (2019). *Environmental health disparities and environmental justice*. National Institute of Health. Retrieved from https://www.niehs.nih.gov/research/supported/translational/justice/index.cfm

National Institute of Health. (2018). *Factors contributing to higher incidence of diabetes for Black Americans*. Retrieved from https://www.niehs.nih.gov/research/supported/translational.cfm

Nelson, C. A., Park, C. K., Gates, R. J., Arreguin, M. E., Salsa, T. M., Miller, H. B., & Manga, M. M. (2018). Clinical and economic impact of an integrated team model on

targeted high-risk Medicare patients with type 2 diabetes. *Clinical Diabetes, 36*(4), 313-318.

Nyenwe, E., Jerkins, T., Umpierrez, G., & Kiabchi, A. (2011). Management of type 2 diabetes: Evolving strategies for the treatment of patients with type 2 diabetes. *Metabolism, 60*(1), 1-23.

Office of Minority Health. (2020a). *Diabetes and African Americans.* U.S. Department of Health and Human Services. Retrieved from https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=18

Office of Minority Health. (2020b). *Obesity and African Americans.* U.S. Department of Health and Human Services. Retrieved from https://www.minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlID=25

Office of Minority Health. (2020c). *Heart Disease and African Americans.* U.S. Department of Health and Human Services. Retrieved from https://www.minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlID=19

O'Malley, A. S., Sheppard, V.B., Schwartz, M., & Mandelblatt, J. (2004). The role of trust in use of preventive services among low-income African-American women. *Preventative Medicine, 38,* 777-785.

Parisi, J., Rebok, G., Xue, Q., Fried, L., Seeman, T., Tanner, E., Greunewald, T., Frick, K., & Carlson, M. (2012). The role of education and intellectual activity on cognition. *Journal of Aging Research.* https://doi.org/10.1155/2012/416132

Pettigrew, T. F. (1979). The ultimate attribution error: Extending Allport's cognitive analysis of prejudice. *Personality and Social Psychology Bulletin, 5,* 461-476.

Rane, K., Wajngot, A., Wandell, P. E., & Gafvels, C. (2011). Psychosocial problems in patients with newly diagnosed diabetes: Number and characteristics. *Diabetes Research and Clinical Practice, 93*(3), 371-8.

Reimann, M., Schilke, O., & Cook, K. S. (2017). Trust is heritable, whereas distrust is not. *Proceedings of the National Academy of Sciences of the United States of America*, 114(27), 7007–7012. https://doi.org/10.1073/pnas.1617132114

Richeson, J. A., & Shelton, J. N. (2006) *A social psychological perspective on the stigmatization of older adults.* National Research Council (US) Committee on Aging. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK83758/

Rose, A., Peters, N., Shea, J., Armstrong, K. (2004). Development of the Health Care System Distrust Scale. *Journal of General Internal Medicine*, *19*, 57-63.

Rowe, R., & Calnan, M. (2006). Trust relations in health care: Developing a theoretical framework for the "new" NHS. *Journal of Health Organization & Management, 20*(5), 376–96. doi: 10.1108/14777260610701777.

Rubenstein, L., Schairer, C., Wieland, D., & Kane, R. (1984). systematic biases in functional status assessment of elderly adults: Effects of different data sources. *Journal of Gerontology*, *39*(6), 686–691.

Schectman, J. M., Nadkarni, M. M., & Voss, J. D. (2002). The association between diabetes metabolic control and drug adherence in an indigent population. *Diabetes Care,25*(6), 1015–1021.

Schmidt, A., Gahr, A., Hermanns, N., Kulzer, B., Huber, J., & Haak, T. (2013). The Diabetes Self-Management Questionnaire: Development and evaluation of an instrument to

assess diabetes self-care activities associated with glycaemic control. *Health and Quality of Life Outcomes, 11,* 138. https://doi.org/10.1186/1477-7525-11-138

Schroder H. (2007). Protective mechanisms of the Mediterranean diet in obesity and type 2 diabetes. *Journal of Nutritional Biochemistry, 18,* 149–60.

Shea, J. A., Micco, E., Dean, L. T., McMurphy, S., Scwartz, J., & Armstrong, K. (2008). Development of a revised Health Care System Distrust Scale. *Journal of General Internal Medicine, 23*(6), 727-732.

Sherman, L., & Williams, J. (2018). Perspective of fear as a barrier to self-management in non-Hispanic Black men with type 2 diabetes. *Health Education and Behavior, 1*, 1-10.

Shiyanbola, O., Brown, C., & Ward, E. (2018). "I did not want to take that medicine": African Americans' reasons for diabetes medication nonadherence and perceived solutions for enhancing adherence. *Patient Preference and Adherence, 12*, 409-421.

Sitkin, S. B., & Bijlsma-Frankema, K. M. (2018). Distrust. In R. H. Searle, A. M. I. Nienaber, & S. B. Sitkin. (Eds.), The Routledge Companion to Trust (pp. 50–61), Routledge.

Sjostrom, C. D., Peltonen, M., Wedel, H., & Sjostrom, L. (2000). Differentiated long-term effects of intentional weight loss on diabetes and hypertension. *Hypertension, 36,* 20–25.

Small, B. J., Fratiglioni, L., & Bäckman, L. (2001). Canaries in a coal mine: Cognitive markers of preclinical Alzheimer's disease. *Archives of General Psychiatry, 58*(9), 859–860. doi:10.1001/archpsyc.58.9.859

Smart Growth America. (2019). *Dangerous by design.* Retrieved from https://smartgrowthamerica.org/dangerous-by-design/

Sommerfield, A., Deary, I., & Frier, B. (2004). Acute hyperglycemia alters mood state and impairs cognitive performance in people with type 2 diabetes. *Diabetes Care, 27*, 2335-2340.

Spitzer, L. (1999). *Patient Health Questionnaire: PHQ*. New York State Psychiatric Institute.

Sullivan, M. D., Katon, W. J., Lovato, L. C., Miller, M. E., Murray, A. M., & Horowitz, K. R. (2013). Association of depression with accelerated cognitive decline among patients with type 2 diabetes in the ACCORD-MIND trial. *Journal of American Medical Association Psychiatry, 70*(10), 1041-1047.

Sutherland, G.T., Lima, J., Srikanth, V., & Bruce, D.G. (2017). Epidemiological approaches to understanding the link between type 2 diabetes and dementia. *Journal of Alzheimer's Disorders, 59*, 393–403.

Thom, D. H. (2001). Physician behaviors that predict patient trust. *Journal of Family Practice,* 50, 323–328.

Thom, D. H., Hall, M. A., & Pawlson, L. G. (2004). Measuring patients' trust in physicians when assessing quality of care. *Health Affairs, 23*(4), 124–132. doi: 10.1377/hlthaff.23.4.124.

Trinacty, C. M., Adams, A. S., Soumerai, S. B. (2007) Racial differences in long-term self-monitoring practice among newly drug-treated diabetes patients in an HMO. *Journal of General Internal Medicine, 22*(11), 1506–1513.

Trinacty, C. M., Adams, A. S., Soumerai, S. B., Zhang, F., Meigs, J. B., Piette, J. D., & Ross-Degnan, D. (2009). Racial differences in long-term adherence to oral antidiabetic

drug therapy: A longitudinal cohort study. *BioMed Central Health Service and Research, 9,* 24. https://doi.org/10.1186/1472-6963-9-24

U.S. Department of Health and Human Services. (2018). *Profile of African Americans age 65 and over.* Administration for Community Living. Retrieved from https://acl.gov/sites/default/files/Aging%20and%20Disability%20in%20America/2018AA_OAProfile.pdf

U.S. Department of Housing and Urban Development. (2013a). *Aging in place: Facilitating choice and independence*. Evidence Matters. Retrieved from https://www.huduser.gov/portal/periodicals/em/fall13/highlight1.html

U.S. Department of Housing and Urban Development. (2013b). *Measuring the costs and savings of aging in place*. Evidence Matters. Retrieved from https://www.huduser.gov/portal/periodicals/em/fall13/highlight2.html

Van den Berg, E., Reijmer, Y. D., & de Bresser, J. (2010). A 4-year follow-up study of cognitive functioning in patients with type 2 diabetes mellitus. *Diabetologia 53*, 58–65. Retrieved from https://doi.org/10.1007/s00125-009-1571-9

Walker, R. J., Smalls, B. L., Hernandez-Tejada, M. A., Campbell, J. A., Davis, K. S., & Egede, L. E. (2012). Effect of diabetes fatalism on medication adherence and self-care behaviors in adults with diabetes. *General Hospital Psychiatry, 34*(6), 598-603.

Washington, H. A. (2006). *Medical apartheid: The dark history of medical experimentation on Black Americans from colonial times to the present.* Harlem Moon.

Wen, M., Zhang, X., Harris, C. D., Holt, J. B., & Croft, J. B. (2013). Spatial disparities in the distribution of parks and green spaces in the USA. *Annals of Behavioral Medicine: A*

Publication of the Society of Behavioral Medicine, 45 Suppl 1(Suppl 1), S18–S27. https://doi.org/10.1007/s12160-012-9426-x

Whetten, K., Leserman, J., & Whetten, R., (2006). Exploring lack of trust in care providers and the government as a barrier to health service use. *American Journal of Public Health, 96*(4), 716–21. doi: 10.2105/AJPH.2005.063255.

Williams, W. M., Yore, M. M., & Whitt-Glover, M. C. (2018). Estimating physical activity trends among blacks in the United States through examination of four national surveys. *AIMS public health*, *5*(2), 144–157. https://doi.org/10.3934/publichealth.2018.2.144

Wolf, T. J., Edwards, D. F., & Giles, G. M. (2019). *Functional cognition and occupational therapy: A practical approach to treating individuals with cognitive loss*. AOTA Press. https://doi.org/10.7139/2017.978-1-56900-477-7

Wunderlich, G. S., & National Research Council (U.S.). (2009). *Improving the Measurement of Late-Life Disability in Population Surveys: Beyond ADLs and IADLs: Summary of a Workshop.* National Academies Press. https://doi.org/10.17226/12740

Yao, N., Chen, S., & Qian, M. (2018). Trait anxiety is associated with decreased visual working memory. *Psychiatry Research, 27*, 474-482.

Yeung, S., Fischer, A., & Dixon, R. (2009). Exploring effects of type 2 diabetes on cognitive functioning in older adults. *Neuropsychology, 23*(1), 1-9.

Zheng, B., Hall, M. A., Dugan, E., Kidd, K. E., & Levine, D. (2002). Development of a scale to measure patients' trust in health insurers. *Health Service and Research, 37*, 187–202.

VITA

Jessica Lyn Bergner was born on February 8, 1994, in Saint Louis, Missouri. She was educated in local public schools and graduated from Potosi High School in 2012. She graduated from the University of Kansas City-Missouri with her Bachelor of Arts degree with magna cum laude honors in 2016.

Mrs. Bergner began the clinical psychology doctoral program at the University of Missouri-Kansas City in the Fall of 2017. She earned her Master of Arts degree in 2019. She is a member of the American Society on Aging, American Psychological Association's Division of Rehabilitation Psychology, and American Psychological Association's Division of Health Psychology.