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A Mixed-methods Approach to Understanding the Perspectives, Experiences and Attitudes of Cognitive Behavioral Therapy for African Americans with Type-2 Diabetes

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Abstract

A Mixed-methods Approach to Understanding the Perspectives, Experiences and Attitudes of Cognitive Behavioral Therapy for African Americans with Type-2 Diabetes

By Ronald Max-Edouard Cornely

Background: Type-2 diabetes is a chronic disease which diminishes the body's ability to properly metabolize blood glucose. As a result, people with diabetes have persistently high blood sugar levels which may cause severe adverse health effects, such as kidney failure or blindness. When stratified by race, diabetes has demonstrated to disproportionately impact marginalized groups. More specifically, Black or African American people in the U.S. face stark diabetes-related health disparities when compared to non-Hispanic White people in the population. As the U.S. population continues to age and levels of obesity rise, diabetes is becoming an increasingly important public health concern. In considering the disproportionate load carried by the African American population, this mixed-methods approach will explore the perspectives and attitudes of African American patients using a novel approach to cognitive behavioral therapy.

Methods: A concurrent quantitative and qualitative study design was applied to assess the perspectives, experiences and attitudes of African American patients with type-2 diabetes. The quantitative strand of data provided measures of participant psychological, emotional and physical well-being as well as self-efficacy and cognitive functioning. The qualitative data strand provided an in-depth exploration of participant perspectives using focus-group interviews, followed in-depth coding methods and subsequent qualitative analysis. The different data strands were independently analyzed, and inferences were subsequently drawn based on the quantitative and qualitative results.

Results: On average participants were 56 years old, ranging 39 to 71 years of age. 79% (n=11) of participants self-identified as women, while 21% (n=3) self-identified as men. The height and weight of participants were also used to measure each participant's Body Mass Index (BMI). BMI calculations revealed that 64% (n=9) of participants were obese, 21% (n=3) were overweight and 14% (n=2) were within a normal weight range for their reported height. 50% of study participants reported having a college degree or higher while the remainder of the participants indicated that they did not attain a college degree. Quantitative results demonstrated statistically significant differences between pre and post study data in diabetes-related distress, generalized anxiety, and patient-related quality of life ($p< 0.05$). Qualitative results elucidated themes in relation to social support, information sharing, contributing factors to diabetes management and intervention receptivity of study participants.

Conclusion: This innovative mixed-methods approach revealed that the skills and knowledge gained from Cognitive Behavioral Therapy may improve perception of diabetes; alleviating the stresses of diabetes self-management. The concurrent results also demonstrated that disseminating health information in a communal setting may mitigate health literacy disparities while bolstering participant social support networks.

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Chapter 1: Introduction and Statement of the Problem and Purpose

Background

Nationally, diabetes is a health concern which affects a significant proportion of the U.S. population. Although diabetes is the seventh leading cause of death for non-Hispanic White people, there exists a clear disparity in the public health burden associated with diabetes in different racial and ethnic groups in the U.S. (Heron, 2016). Most notably, diabetes is the fifth leading cause of death for Non-Hispanic Black people, Asian Americans and Pacific Islanders, while ranking fourth in the Native American population (Heron, 2016). Diabetes results in 4-6% of yearly deaths in the aforementioned non-white racial groups, while only accounting for 2.5% of annual deaths in non-Hispanic White people (Heron, 2016). This data indicates that African Americans, Hispanic Americans, Native Americans, Asian Americans and Pacific Islanders are at a higher risk for diabetes-related morbidity and mortality. This greater health burden in marginalized racial groups informs us that this chronic disease should be prioritized in community health considerations for non-white populations.

In the state of Georgia, diabetes is included in the state's prioritized health needs as indicated by the 2016 Kaiser Permanente Health Needs Assessment. The Kaiser report lists the following risk factors associated with diabetes: diet, physical activity, depression and genetic markers (Clouser & Willis, 2016). These risk factors elucidate that diabetes is a multifaceted health condition which requires a multifaceted approach. The risk factors encompass lifestyle choices and mental health needs, along with the biological factors associated with diabetes, such as a genetic predisposition. The largest marginalized racial group in the state Georgia is the African American population, constituting 32% of the state’s population ("Georgia Population 2019", 2019). Only the White population in the state of Georgia outnumbers African Americans, since they constitute 60% of the state’s population ("Georgia Population 2019", 2019). Given that such a significant proportion of the Georgia’s population is African American, it is appropriate to evaluate the effects of diabetes for this racial group. This is especially appropriate considering the greater diabetes-related health burden the African American population faces.

Beyond the disparity associated with the burden of health associated with diabetes, there exist other sociological factors which disproportionately affects African Americans with type 2 diabetes. Racial discrimination has been associated with poorer health outcomes in type 2 diabetes (Peek et al., 2019). More specifically, self-reported discrimination by patients with type 2 diabetes is shown to be associated with negative health outcomes demonstrating that factors outside of patient behaviors contribute to poor health outcomes (Peek et al. 2019). The effects of socioeconomic status (SES) has also been shown to be associated with the prevalence of type 2 diabetes in the African American community. Robbins et al. (2001) found that African American women experience an excess prevalence of type 2 diabetes in part due to being economically disadvantaged. Therefore, not only are African American individuals having poorer health outcomes due to racial discrimination, they are also more likely to have poorer diabetes management due to being economically disadvantaged, further aggravating the impact of type 2 diabetes on a population which shares a greater burden of this complex and devastating disease.

Problem Statement

Diabetes is a chronic disease which is nationally recognized in the U.S. as a major health concern. Diabetes is associated greater morbidity and mortality in marginalized communities. In the state of Georgia, diabetes is of particular interest given that a significant proportion of the state's population identifies as Black or African American and may experience other factors which further aggravate the burden that diabetes places on that population, including racial discrimination and low SES. This study explores the attitudes, experiences and perceptions of African American patients with diabetes who have undergone a Culturally Tailored Cognitive Behavioral Therapy Intervention at Emory University's primary care clinic located in Dunwoody, GA. This study is meant to address the lack of information surrounding diabetes care in the African American Community and collect much needed information on diabetes care from the viewpoint of African American individuals.

Significance Statement

The findings of this study address a significant gap in the literature concerning the self-management of diabetes from the perspective of African American patients. Although there is extensive literature on Cognitive Behavioral Therapy and its efficacy, there is very little information on how it is perceived by African American patients, or its efficacy in this marginalized group of individuals. Therefore, a mixed-methods approach was implemented to explore the potential of Cognitive Behavioral Therapy in treating type 2 diabetes. The study is meant to provide a deeper understanding of the insights of African American patients on how they will move forward having had a supplemental intervention to their traditional diabetes clinical care.

Theoretical Framework

Diabetes management in African American patients requires an understanding of this marginalized group's environment, sociological factors, and psychosocial factors that lie beyond the biological determinants of the disease. The social ecological model has been noted to address the cultural, political, socioeconomic, psychological, and biological determinants of health (Stokols, 1996). The framework of this theoretical model uniquely offers a paradigm which allows a multifaceted approach to the overarching research question. The African American individuals being studied have not only been considered in terms of how diabetes affects them, but from the perspective of how it is affected by factors such as their social support systems and point of view has shaped by their built environment. Whittemore, Melkus, & Grey (2004) provided a framework of the Social Ecological Model specifically geared towards African Americans with type 2 diabetes which was invaluable in the theoretical consideration of this exploration. It was particularly useful in the consideration of the multifaceted approach of type 2 diabetes in African American patients in Atlanta, GA.

Purpose Statement

The aim of this study is to gain a better understanding how treatment methods are received by African American patients. Through a mixed methods approach, this exploration provides a deeper understanding of how Cognitive Behavioral Therapy is perceived by African American patients in a small pilot study conducted at Emory's primary care clinic located in Dunwoody, GA.

Research Question

What are the perspectives, experiences and attitudes of African American/ Black individuals of Cognitive Behavioral Therapy intervention for type 2 diabetes management?

Sub-Questions:

- How was the intervention received by study participants?
- Do differences between baseline and follow-up study scales align with positive or negative participant perspectives of the intervention?

A mixed-methods approach to understanding the implications of motivational/ cognitive therapy for African Americans with type 2 diabetes in the State of Georgia.

Definition of Terms

African American/ Black: Study population of interest which includes anyone who identifies with the racial group of individuals that has been historically disenfranchised in American history for having features such as darker skin or coarse hair. These individuals may be native to the U.S. or from countries outside of the U.S. as long as they identify with being Black.

Burden of Health: How extensively a given health issue impacts a given individual, group, or population.

Cognitive Behavioral Therapy: A technique that incorporates psychological and behavioral methods for treating chronic diseases.

Diabetes: A chronic disease characterized by abnormally high levels of sugar in the blood, which can lead to higher morbidity and mortality if not properly treated.

Type 2 diabetes: A chronic medical condition that affects the way your body processes blood sugar. It is generally characterized by high levels of blood sugar due to the body's inability to recognize insulin and properly uptake blood sugar into cells.

HbA1C: Also known as hemoglobin A1C, which is a measure that provides the average blood sugar concentration in the past 2-3 months. It is mainly used as an indicator of diabetes severity.

Disparity: An unequal distribution of a given health burden among different groups based on different designations in identity (i.e. race, gender, class etc.).

Morbidity: Adverse health status which results in a lowered quality of life.

Mortality: Death due to a given health concern.

Self-Management: The patient's participation in regulating and maintaining proper care in a chronic disease.

Social Ecological Model: A multifaceted approach to considering a health problem that explores social and environmental determinants of a health issue.

Social Network: The extended group of individuals with whom someone interacts with in their given social circles. This can also include individuals who directly or indirectly

Chapter 2: Review of the Literature

Introduction

Diabetes is a chronic disease which directly impacts over 100 million people in the United States (U.S.); 30 million Americans currently live with diabetes, while 84 million are prediabetic ("Division of Diabetes Translation at A Glance | CDC", 2018). People who are prediabetic are individuals who have high levels of blood glucose but have not yet reached the threshold which would result in a diabetes diagnosis. These individuals are at a high risk for type 2 diabetes, heart disease and stroke, along with more serious health complications such as amputations and kidney failure ("Division of Diabetes Translation at A Glance | CDC", 2018). In 2016, diabetes was ranked as the seventh leading cause of death in the U.S., resulting in more than 80,000 deaths annually, and is most prevalent in adults over the age of 45 (Heron, 2016). It should be noted that the incidence of diabetes diagnoses has more than doubled over the last 20 years in the U.S., with an aging population that has become more overweight ("Division of Diabetes Translation at A Glance | CDC", 2018). As the U.S. population continues to age, there is an increased public health burden associated with diabetes. It is, therefore, a chronic health condition which should be prioritized.

A Deeper Discussion of the Theoretical Framework

Social Ecological Model

The social ecological theoretical framework incorporates a multifactorial approach to addressing health-based issues. Socioeconomic, cultural, environmental, biological and psychological factors are levels of influence which are often complex and interdependent when considering health-based interventions (Whittemore, Melkus & Grey, 2004). Considering type 2 diabetes for African American patients with this the social ecological framework allows the exploration of how these different levels of influence contribute to diabetes health outcomes. For the purpose of this exploration, three levels of influence are essential to consider: the effects of socioeconomic status and discrimination, the interpersonal relationship of patients and healthcare providers and the self-management behaviors of African American patients.

The highest level of influence to consider in respects to type-2 diabetes for African American are the effects of discrimination and SES. Social discrimination against African Americans and stigmatization coupled with a lack of social and economic resources have been documented to negatively impact health outcomes (Flaskerud & Nyamathi, 2002; Whittemore et al., 2004). There is a disproportionate incidence of diabetes of lower-SES people in respects to their occupation, income and chosen vocation (Chatterjee et al., 2015). Whittemore et al. (2004) report a strong inverse relationship between SES and diabetes incidence, citing that as income and educational level decrease the diabetes risk increases two-fold. The interaction of discrimination and SES is complex in how they collectively contribute to the greater incidence of type-2 diabetes. To exemplify, discrimination can be readily observed when comparing high-income and low-income neighborhoods. High-income areas have more beneficial and healthier built environments with more pharmacies, supermarkets and exercise facilities. In comparison, Low-SES environments are plagued with fast-food businesses, and convenience stores that are unaffordable given income levels (Whittemore et al., 2004). The increased crime and violence prevalent in low-income neighborhoods can also limit exercise as well as limit the ability to form beneficial social networks to promote healthy social behaviors (G. A. Kaplan, Everson, & Lynch, 2000). As a result, SES can contribute to a multitude of factors, including reduced physical activity, unhealthy dietary practices and lack of access to healthcare due to costs (Chatterjee et al., 2015).

Interpersonal relationships significantly contribute to health behaviors of individuals when considering the framework of the social ecological model. In respect to patients with type-2 diabetes, an important interpersonal dynamic to consider is that of the patient and the healthcare workers with whom they interact. The literature specifically cites that community nurses are essential as diabetes care expands from primary care management to efforts aimed at diabetes prevention (Whittemore et al., 2004). Being intentional in how these particular health workers interact with the diabetes community can have highly beneficial implications. These workers have the skills to effectively expand diabetes prevention and management efforts in the community context to impact individual-level behavioral choices (Whittemore et al., 2004). A more active role from community nurses can allow a more patient-centered approach which adds a layer of social support to diabetes patients from the healthcare field itself. Incorporating social support to treatment methods is particularly intriguing given that social support is an important dimension of positive behavioral change in individuals (Whittemore et al., 2004).

Providing a space for community and discussion in a healthcare setting through Behavioral Therapy is also a model of social support which may be beneficial. A model that was provided in the present intervention's design.

Another core level of influence in the social ecological model is the individual's intrapersonal motivations. The day-to-day health behaviors populations practice significantly contribute to the prevalence of obesity and diabetes (Whittemore et al., 2004). There is a cultural trend of sedentary lifestyle choices and the consumption of high-fat, high-calorie diets which have been exacerbated by the convenience of modern technology in the United States (Whittemore et al., 2004). The limited activity associated with sedentary lifestyles coupled with limited access to healthy food contribute to obesity, a contributing factor in more than 80% of diabetes cases (Whittemore, 2004). African Americans have markedly lower rates of fruit and vegetable intake, usually consuming food with higher sugar contents and loads (Chaterjee et. Al, 2015; Whittemore et al., 2004).

The intrapersonal level of influence is also important to consider for the social ecological model. An essential comorbid factor which can impact the intrapersonal level of influence for type 2 diabetes control is depression. The ability for people to optimize their health outcomes through behavioral change is influenced by their attitudes, beliefs and knowledge (Whittemore, 2004). Depression is a comorbid factor which may negatively impact an individual's attitude and beliefs related to the proper management of diabetes. The bidirectional effect of depression and diabetes indicates that depression may be a factor which negatively impacts diabetes outcomes (Holt et al., 2014).

Previous research indicates that diabetes education programs are most readily consumed by highly motivated, educated White individuals (Whittemore et al., 2004).

Other than the limited access African American people may have to such programming, the designation of people who participate in them are “highly motivated” indicates that individuals who struggle with depression may be less likely to engage. Depression is a complex factor to consider as social and environmental factors linked to discrimination and SES for African Americans can influence depression and its associated risk to diabetes (Chatterjee, 2015). The intrapersonal level of influence is therefore a complex amalgam of social and personal factors which is highly individualized in how it ultimately impacts each African American with diabetes. Despite the differential manner in which factors may impact individuals may have differential influences, the factors faced by individuals are consistently present. Specifically, discrimination and low SES are factors which can adversely influence health outcomes related to the comorbid relationship of depression and diabetes in African Americans.

Diffusion of Innovations Model

The Diffusion of Innovations theoretical framework is used to disseminate information to target groups. This model was used in designing the interview guide found in Appendix A. Diffusion of Innovations uses a process of communicating an innovation through specified channels to members of a predefined social system (Rogers, 1995). It is a specific type of communication in which novel information is given to the population through four main elements: innovation, communication channels, social system and time (Rogers, 2003).

The innovation being assessed is the Cognitive Behavioral Therapy through web-based and in-person intervention formats. Communications channels were the culturally tailored materials presented to participants during the study. The social system is the target population: Black or African American patients with type-2 diabetes. The time is the incorporation of the study over a six-session intervention time frame. The diffusion of Innovations model helped incorporate these key elements into the interview guide to theoretically frame the information garnered from study participants.

Literature Review

According to the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), diabetes is a disease in which the human body has difficulty properly metabolizing the sugar it consumes. More specifically, type 2 diabetes is a form of the disease in which cells in the body have difficulty recognizing the hormone necessary for proper diabetes metabolism or making enough of that hormone (NIH | NIDDK, 2017). If diabetes is left undiagnosed or uncontrolled serious health complications may arise, such as heart disease, kidney failure, blindness and even lower-extremity amputations ("CDC Media Relations - African American Health Disparities - Diabetes Q&A").

Diabetes has been documented to have a disproportionate impact on the African American population of the United States. According to the Centers for Disease Control and Prevention (CDC), African Americans are 1.7 times more likely to develop diabetes as people who are White. Also, about 10.8% of the African American population has diabetes and suffer a diabetes-related mortality rate that is 27% higher than people who are White ("CDC Media Relations - African American Health Disparities - Diabetes Q&A"). These disproportionate diabetes outcomes have been linked to traditional risk factors such as obesity and lower SES. The health disparity of diabetes has also more broadly been linked to other risk factors attributed to the environment and lifestyle choices of African Americans (Chatterjee, Maruthur, & Edelman, 2015).

General treatment plans for type 2 diabetes highlight consistent monitoring of blood glucose, blood pressure and cholesterol levels (NIH | NIDDK, 2017). Proper use of diabetes care medications and insulin injections accompanied with a healthy diet and exercise regimen are also advised in a diabetes treatment plan ("CDC Media Relations - African American Health Disparities - Diabetes Q&A"). Properly monitoring and managing diabetes can help prevent the aforementioned debilitating health complications.

It is important to note that a major documented comorbid factor to diabetes is depression. Studies have shown that depression and diabetes are likely to occur together twice as frequently as would be predicted simply by chance (Anderson, Freedland, Clouse, & Lustman, 2001). The incidence of depression has also been documented to be 24% higher in people with diabetes (Nouwen et al., 2010). Not only are diabetes and depression more like to occur together, but they have been shown to exacerbate symptoms. Epidemiological studies have demonstrated that the association between the two illnesses is bidirectional, which means that diabetes can impact diabetic patient psychological well-being while depression can impact the severity of diabetes symptoms (Golden et al., 2008; Holt et al., 2014). More specifically, people with diabetes have longer lasting depressive episodes that occur more often than those in the general population (Chatterjee et al., 2015). Lifestyle factors, such as diet and exercise, may further reinforce the comorbidity of depression and diabetes (Chatterjee et al, 2015). A key example provided by Chatterjee et al. (2015), is the sedentary lifestyle of people with depression who also tend to consume diets high in saturated fats and sugars, which places them at an increased risk of developing type 2 diabetes.

Support from medical professionals is vital in respect to understanding and treating diabetes with the comorbid factor of depression. Each case of diabetes and depression has a unique set of challenges given that the presentation of these illnesses is not monolithic in the population. It is noted that proper diagnosis of depression requires a time-consuming interview by healthcare professionals, which often overlooks the possibility of a diabetes diagnosis (Chatterjee, 2015). Healthcare systems also lack the proper infrastructure to address the underdiagnosed comorbidity of diabetes and depression given that they are becoming more fragmented and specialized (Chatterjee, 2015). Healthcare professionals can support proper diabetes treatment by incorporating a multidisciplinary team approach of identifying the comorbid effects of diabetes and depression in primary care settings. The most effective clinical outcomes to diabetes have incorporated therapy by specially trained case managers and psychotropic medications (Katon et al., 2004). The appropriate adjustments by healthcare professionals in the primary care setting may, therefore, improve treatment outcomes and quality of life of those suffering from type 2 diabetes.

Previous research in diabetes treatment has provided many treatment models for type-2 diabetes management. The information provided by these varied intervention techniques have revealed three prominent treatment models: diabetes self-management, behavioral therapy and social network integration. These models have shown promise in assisting diabetic individuals to better control their blood sugar levels in minimizing the impact that diabetes may have on their overall health. It is, therefore, pertinent to explore the information gleaned from these studies to understand the current knowledge of treatment methods of type 2 diabetes.

Self-management, the adherence to medicine and treatment methods of a disease, is a key aspect of diabetes management. People with type-2 diabetes are able to prevent health-related complications if the appropriate behavioral changes are made in managing their diabetes (Haas et al., 2013; Al-Dwaikat et al., 2019). Social support has been demonstrated to be positively correlated with improved diabetes outcomes while depression has been shown to be negatively correlated with diabetes management (Al-Dwaikat et al., 2019). A study by Marincic et al. (2017) utilized a combination of medical nutrition therapy and self-management education to explore whether there would be improved patient outcomes. Patients demonstrated significant weight loss, A1c reduction, and a decrease in cholesterol levels (Marincic et al., 2017). Peña-Purcell et al. (2019) explored the impact of diabetes self-management education on diabetes related health outcomes. Results demonstrated improved self-care, improved self-efficacy and lower levels of psychological distress (Peña-Purcell et al., 2019). African Americans also demonstrated better health status with their improved psychological distress (Peña-Purcell et al., 2019).

Carpenter, DiChiacchio, & Barker (2019) conducted an integrative review of the self-management of type 2 diabetes to summarize and critique interventions which support diabetes self-management. Results from a review of studies from seventeen different countries demonstrated improved behavioral, psychological and physiological factors (Carpenter, DiChiacchio, & Barker, 2019). These results indicate that the perspecitves and participation of patients is vital in the continued success of properly treating type 2 diabetes. The study locations included countries such as the U.S., Thailand, Japan, China, Australia and the Netherlands among other countries. It is particularly interesting that the different cultural and anthropological backgrounds of the countries considered in the study yielded favorable results in respect to a self-management model in type 2 diabetes management. A study limitation of the systematic review was the inability to provide a translational model for clinical practice. Although self-management may be efficacious, its use in a clinical setting is not yet developed given the wide breadth of methodologies in the interventions of this scholarly review.

Behavioral therapy is a technique in which patient care is coupled with cognitive and psychosocial techniques to improve health outcomes of traditional diabetes treatment. Diabetes is a chronic disease which requires a long-term treatment regimen to attain and maintain glycemic control (Uchendu & Blake, 2017). This involves a daily consideration of how lifestyle choices may result in adverse health outcomes that can result in increased morbidity or even death. This consistent consideration of possible morbidity or mortality can result in increased psychological stress (Llorente and Malphurs, 2007). The behavioral regimentation that diabetes demands coupled with the psychological challenges of coping with the diagnosis can induce distress, depression, and anxiety related to diabetes (Uchendu & Blake, 2017). These cognitive hurdles are considered to be important to patient self-management, apart from the knowledge and skill patients require to navigate the daily demand of treating their diabetes (Uchendu & Blake 2017). It is, therefore, important to recognize that there are aspects of treatment which lie outside of the traditional paradigm of clinical medicine. Current treatment methods involve generalized suggestions of acceptable behaviors to improve diabetes outcomes by physicians during short primary care visits. Such short and generic advice may be inadequate in effectively treating type 2 diabetes, a multifactorial chronic disease. The added dimension of Behavioral Therapy may effectively supplement the wholistic treatment of diabetes by providing skills and knowledge to the patient that stretch beyond the scope of a short primary care visit. Cognitive Behavioral Therapy (CBT) is one such method to integrate with traditional treatment methods in hopes of improving patient outlook and resultant health outcomes of chronic diseases like type 2 diabetes.

A few studies assessed the efficacy of CBT in treating type 2 diabetes indicated inconclusive results in respect to the CBT's efficacy in managing type 2 diabetes. Ismail et al. (2018) trained nursing staff in motivational interviewing and CBT to determine if the added training supported improved glycemic control. This study compared an intervention group with trained nurses with a control group whose method of care was unchanged to assess if patients would have improved self-management. The nurses in the intervention group incorporated motivational interviewing (MI) and CBT in treating the patients. When incorporating MI techniques, nurses were trained to encourage patients using collborative, non-judgemental and affirming communication to promote behavioral change (Ismail et al., 2018). The nurses used six key skills integrated from MI and CBT models: active listening, managing resistance, directing change, supporting self-efficacy, addressing helath beliefs and shaping behaviors. After an 18-month period, outcomes associated with glycemic control and patient self-management were assessed, resulting in no significant difference between the two groups. Clarke et. Al (2019) administered an online CBT intervention to a treatment group and an online placebo program to a control group to assess the efficacy of CBT on type-2 diabetes. The study results indicated that the placebo intervention had a slight significant improvement in blood glucose manegment when compared to the CBT program. Although these study findings did not support CBT interventions they may indicate that a support program that promotes healthy lifestyle changes may be sufficient in diabetes management. The studies discussed did not have conclusive results in respect to the efficacy of CBT. It is important to note that adverse diabetes management outcomes following CBT intervention strategies were not documented despite inconclusive results. These findings may be inconclusive, but do not indicate that CBT is not efficacious. There is therefore further study necessary to adress the undertainty in how effective CBT is in treating type 2 diabetes.

Although some studies had inconclusive results for CBT efficacy in type 2 diabetes management, there are studies in the available body of research which support CBT as a beneficial intervention technique. Previous research has demonstrated improved diabetes management when CBT is intergrated into patient care models for type 2 diabetes. Cummings et al. (2019) coupled CBT with lifestyle counseling in a primary clinical care setting. The study assessed biological markers of diabetes along with behavioral outcomes of diabetes management. These assessments were coupled with a 6-session CBT framework over a 12-month period. The study results suggested improved behavioral, biological and mental health outcomes. Safren et al. (2016) assessed the efficacy of CBT in patients with type 2 diabetes who also experienced depression. This study found CBT to be an effecitve method of improving medication adherrence, depression and glycemic control for individuals adults with type 2 diabetes and depression. It should be noted that both Safren et al. (2016) and Cummings et al. (2019) emphasized that diabetes-related distress and depression can contribute to low glycemic control, treatment adherrence behaviors and self-management. Both studies also mentioned that CBT was efficacious in addressing self-management behaviors and mitigating the effects of depression and distress on patient health outcomes. Additionally, findings from a systematic review support CBT as a tretment method (Uchendu & Blake, 2017). The review examined twelve randomized control trials to assess outcomes such as glycemic control, diabetes-related distress, diabetes, depression, and quality of life for type 1 and type 2 diabetes (Uchendu & Blake, 2017). The study found that short- and medium-term glycemic control, depression and anxiety outcomes improved along with long-term depression outcomes. Uchendu & Blake's (2017) study therefore concluded that CBT may be beneficial in inproving glycemic control and other aspects of psychological health, but was conclusively beneficial for outcomes related to depression. It should be noted that all of these studies emphasized that diabetes-related distress and depression can contribute to low glycemic control, treatment adherrence behaviors and self-management. The studies also mentioned that CBT was efficacious in addressing self-management behaviors and mitigating the effects of depression and distress on patient health outcomes. The behavioral and psychosocial aspects of diabetes managemment is, therefore, shown to be pertinent in diabetes control. These studies have emphsizaed that CBT intentionally incorporates psychological and behavioral factors of diabetes into management plans, futher bolstering it as a promising component of patient-centered clinical care models.

Apart from the psychological and behavioral factors associated with diabetes management, the social network of an individual has also been found to be pertinent in diabetes management. Shaya et al. (2014) designed an intervention in which the intervention group attended monthly support groups and were encouraged to recruit peers to form small groups as added support, while control groups consisted of individuals attending educational sessions. The intervention group of the study had greater reduction in blood glucose and improved behavioral outcomes associated with diabetes manegment. Therefore, the quality of an individual's social network could be an indicator of improved health outcomes in diabetes management. This further supports the idea that diabetes treatment is multifaceted and must consider those affected by diabetes more holistically.

Although peer-reviewed research demonstrates mixed results in terms of available evidence concerning type 2 diabetes management, key findings help to inform current study interests. First, diabetes is a chronic disease that requires the investment and interest of both healthcare professionals and the individuals being treated. Secondly, the information presented has introduced a behavioral and psychological aspects to diabetes are fundamental in understanding the full scope of diabetes as a chronic disease. Finally, the sociocultural environment that the individual inhabits can be influential on health outcomes, especially an indicator such as the individual’s social network. These findings support the idea that a Cognitive Behavioral approach may be paramount in considering a more holistic approach to effectively treating diabetes long-term.

Summary & Study relevance

Peer-reviewed research yielded results that were both inconclusive and supportive of CBT intervention techniques for Type-2 diabetes management. The data indicates that diabetes management requires the participation of patients in their treatment and an investment of healthcare professionals in implementing more holistic treatment plans. The information presented also highlighted the fundamental importance of both behavior and psychology in truly understanding diabetes as a chronic disease. Beyond the work of healthcare professionals and the intrapersonal factors which inform diabetes management, the sociocultural environment diabetes patients interact with can influence health outcomes. Indicators such as the individual's social network can greatly impact how they view diabetes treatment efforts. Therefore, CBT may offer a more wholistic approach for people with diabetes to manage their diabetes-related health outcomes.

Previous studies lack information regarding patient perceptions of CBT. There is also no mention of racial diversity in study design or study participants. This is particularly concerning given the demonstrated disparity in health burden associated with type 2 diabetes in the U.S. (Heron, 2016). Previous work also lacks a deeper understanding of the attitudes of study participants following interventions tailored CBT intervention techniques. This provides a deeper understanding of the attitudes of perceptions of African American patients with type 2 diabetes through a mixed methods approach. The quantitative data evaluates the efficacy of a Culturally Tailored CBT intervention conducted with African American patients at Emory University's primary care clinic in Dunwoody, GA. We quantitatively assessed behavioral and psychological indicators of diabetes management at baseline and following the 6-session intervention. The qualitative data provided the attitudes, perceptions and overall experience of the CBT intervention. It also included the patients’ perceptions of diabetes management following the intervention.

Chapter III: Methodology

Introduction

This study was part of a behavioral intervention being conducted at Emory University's Primary Care Clinic in Dunwoody, GA by Dr. Ambar Kulshreshtha. Dr. Kulshsrestha's pilot study aimed to provide a Culturally Tailored CBT intervention to African American patients to determine the feasibility and acceptability of the intervention on the population of interest. The participants were administered a behavioral intervention (CBT) program, from March 2019- May 2019, to determine if the CBT program was more efficacious than traditional diabetes primary care efforts. In addition to testing the intervention, additional data were collected to understand the perspectives of African American patients concerning CBT as a treatment method for type-2 diabetes.

A concurrent quantitative and qualitative mixed methods typology was used to analyze the study results. This method consisted of the independent evaluation of qualitative and quantitative strands of data, which were then analyzed concurrently to inform study results (Clark & Ivankova, 2017). The quantitative strand of data provided measures of participant psychological, emotional and physical well-being as well as self-efficacy and cognitive functioning. The qualitative data strand provided an in-depth exploration of participant perspectives, which is essential given the limited information available about African American experiences regarding treatment of chronic diseases. This information provided insight on the disproportionate health burden Black or African American people share of chronic diseases in the U.S.

The study was approved by the Emory Institutional Review Board (IRB #00101847), and successfully amended to conduct additional focus groups for the purpose of this study.

Population & Research design

Dr. Kulshrestha's LIGHT (Lifestyle Intervention Guidance for a Healthier Tomorrow) study, is a pilot study aimed at assessing whether Culturally Tailored CBT can improve health outcomes for African Americans with uncontrolled type-2 diabetes. Participants were required to be at least 18 years old, fluent in English, identify as African American, and have an HbA1C level > 8% (indicative of uncontrolled type-2 diabetes). Potential participants were excluded if they did not have access to the web, were using insulin pumps, were pregnant, were actively abusing substances (including alcohol) and had severe visual or other physical impairments which would be a barrier to intervention participation. Potential participants were recruited from primary care clinics at Emory. Recruitment efforts consisted of contacting potential participants via letter or phone call from a study team member with a study description.

Once recruitment was completed, the study included twenty adult African American patients with uncontrolled type-2 diabetes (HbA1C >8%). The study consisted of two intervention techniques, a web-based CBT intervention and an in-person CBT intervention. The study was a randomized, parallel trial design which used both web and in-person platforms. The intervention mainly focused on using health education about food planning coupled with CBT interventions tailored specifically for Black or African American individuals. Six 1-hour sessions were co-facilitated by a Physician and a Behavioral Interventionist, which dedicated 15 minutes to food planning education and 45 minutes to culturally tailored CBT presentations and interactive activities. It is important to note that the in-person intervention format allowed for group interaction while the web-based group had very limited opportunities for group interaction. The use of both platforms in a behavioral intervention for diabetes patients is a novel technique for behavioral health research.

The purpose of this study was to explore the perspective of African American patients who had recently participated in a CBT intervention for type-2 diabetes management. Post-study focus groups were conducted to provide insight on participant outlooks of CBT as an intervention and their management of diabetes. Of the twenty initial study participants, ten participated in the post-study focus groups. One focus group consisted of five participants from the web-based intervention, while the other included five participants from the in-person intervention group. The perspectives of these focus group provided the qualitative data necessary to assess the acceptability of CBT as an intervention for African American individuals.

Quantitative Procedures & Measures

Quantitative Scales

Study participants completed a baseline and follow-up set of quantitative scales and assessments. These quantitative measures collected information concerning Demographic information, self-efficacy measures, generalized anxiety severity, depression severity, perceived stress, health-related quality of life (HRQoL), and cognitive ability. The specific measures for these quantitative analyses can be found below.

Demographic Information. The information collected included age, gender, education level, and marital status. Participants self-reported their age, which was used as a continuous variable. Gender was categorized based on the gender binary of man and woman. Education level was categorized as follows: less than a college degree and more than a college degree. Marital status was categorized as single, married or divorced. Information concerning participant weight status and the number of years since their diabetes diagnosis were also collected. Weight status was categorized as normal weight, overweight and obese using participant Body Mass Index (BMI) in categorizing participants.

Self-Efficacy Measures. Self-Efficacy was measured using the Self-Management Resource Center's Self Efficacy for Diabetes scale. This 8-item scale is meant to assess diabetes self-management. The scale ranged from 1 (not at all confident) to 10 (totally confident). The scale uses the average score across all items to quantify the level of self-reported confidence that participants have in completing tasks related to self-management. The closer to 10 the score is the higher the level of self-efficacy experienced by participants.

Distress. Distress was measured using the Diabetes Distress Screening Scale. This 17-item scale assesses the severity of life difficulties experienced by people living with diabetes through an overall score and four dimensions: emotional burden, regimen distress, interpersonal distress and physician distress ("Scales and Measures"). The scale is scored based on the following Likert designations: 1=Not a problem, 2= A slight problem, 3= A moderate problem, 4=Somewhat serious problem, 5= A serious problem, 6= A very serious problem. The patient's responses associated with each of the four dimensions were summed then divided by the number of items in the given dimension. The mean of the responses to all 17 items was also calculated to determine the overall distress experienced by study participants. A mean score of 3 (moderate distress) or higher is serves as the indicator for clinical attention for study participants.

Generalized Anxiety. Generalized anxiety was assessed using the Generalized Anxiety Disorder (GAD)- 7. This scale is a self-reported questionnaire which screens the severity of GAD in the given study participant in the two weeks prior to the administration of the scale. This assessment determines the degree to which participants have felt nervous, anxious, worried or restless (Williams, 2014). The GAD-7 scale has a range of 0-21. Severity can be classified as low (score of 0-5), mild (score of 6-10), moderate (score of 11-15), and severe (score of 16-21) based on the score received on the self-administered questionnaire.

Depression. Depression was assessed using the Patient Health Questionnaire (PHQ)-9 scale. This self-administered questionnaire assesses each of the DSM-IV criteria with response options ranging from 0 = “not at all” to 3= “nearly every day” (Kroenke et al., 2001). Final scores can range from 0 to 27 in severity. The severity classifications associated with this range of scores are as follows: low (score of 0-4), mild (score of 5-9), moderate (score of 10-14), moderately severe (score of 15-19), and severe (score of 20-27).

Perceived Stress. Patient perceived stress was assessed using the Perceived Stress Scale (PSS). This scale was developed to measure the degree to which individuals appraise situations in life as stressful (Cohen et al., 1983). Generally, stress is assessed in reference to life events in the past month. The scale also includes questions which pertain to the present levels of stress the individual may be experiencing. The scale is scored based on the following Likert designations: 0=never, 1= almost never, 2= sometimes, 3=fairly often, 4= often. The final score (range of 0 to 40), will be used to determine whether an individual's perceived stress is classified as low (score of 0-13), moderate (score of 14-26) or severe (score of 27-40).

Health-Related Quality of Life. Health-Related Quality of Life (HRQoL) was assessed using the RAND-36 survey instrument. It is a scale which assesses eight health concepts: physical functioning, role limitations caused by physical health problems, role limitations caused by emotional problems, social functioning, emotional well-being, energy/fatigue, pain and general health perceptions (Hays & Morales, 2001), This scale was specifically used to provide a means a measuring a clinically relevant difference in quality of life between baseline and follow-up data. Each health concept is scored on a continuous scale which ranges from 0 to 100. Higher scores reflect a more positive perception of health-related quality of life in the given category, while lower scores indicate a more negative perception of health-related quality of life.

Cognitive Ability. Cognitive ability was assessed using the Montreal Cognitive Assessment (MoCA) scale. This questionnaire was administered by trained study personnel to the study participants. It is used as a rapid screening instrument for cognitive dysfunction and assesses cognitive domains such as attention and concentration, executive function, memory, language, conceptual thinking, calculations, orientation and visuoconstructional skills ("VA.gov: Veterans Affairs", 2007). The scale consists of 12 different tasks which assess different aspects of cognitive function by requiring the participant to perform different tasks. Participants are required to draw for visuospatial reasoning, name items to test memory and repeat given information to test attention and language. Each item is provided a score based on different dimensions of completion (i.e.

contour and numbers for drawing task). The sum of item scores is then calculated to provide the final score which can range from 0 to 30. A score of 26 or greater is deemed “normal.”

Quantitative Data Analysis

The Quantitative Data analysis was conducted through the SAS 9.4 M5 software. The data set was first used to create a table to assess if all the variables had successfully been imported. Linear regression analyses were then applied to determine if the baseline and follow-up study data yielded any statistically significant differences between the web-based and in-person intervention groups, using the proc-genmod procedure. This preliminary analysis did not yield any results which indicated the presence of statistically significant differences between groups.

The study results of each of study participants as a whole were assessed to determine if there existed a statistically significant difference between the baseline and follow-up data. The baseline and follow-up data for each group were then averaged and compared to determine if there was a statistically significant difference within each group. The analyses were conducted using paired t-tests to assess study results from the continuous study scales. Each study scale was independently analyzed to report whether there were differences between baseline and follow-up results. Statistically significant differences were also reported for continuous study scales.

Qualitative Procedures and Measures

Qualitative Semi-Structured Focus Groups

The qualitative data was collected through focus group discussions with study participants at Emory University Healthcare System's Dunwoody clinic. The intervention was conducted in two settings, a web-based group and an in-person group. Given the different intervention techniques, participants were assigned to discussion groups based on the intervention type with which they participated. The in-person and web-based groups were respectively held on May 11 and May 19, 2019 in the clinic's conference room. Participants were compensated $10 for the group discussion session. The groups were conducted in-person, were audio-taped, and were roughly 25 minutes in length. Focus group participants were provided with written consent forms since participating in this additional study component required an Emory IRB amendment.

Qualitative Measures

The focus group discussion guide included concepts related to study acceptability and cultural congruence. More specifically, the sections of the guide were concerned with the following: 1) Compatibility, complexity, observability and relative advantage of a culturally tailored CBT for African American patients; 2) Cultural sensitivity of the study. The semi-structured design of the interview prompted the use of open-ended focus group questions. The questions used to assess compatibility, complexity, observability and relative advantage can be found in the interview guide located in Appendix A.

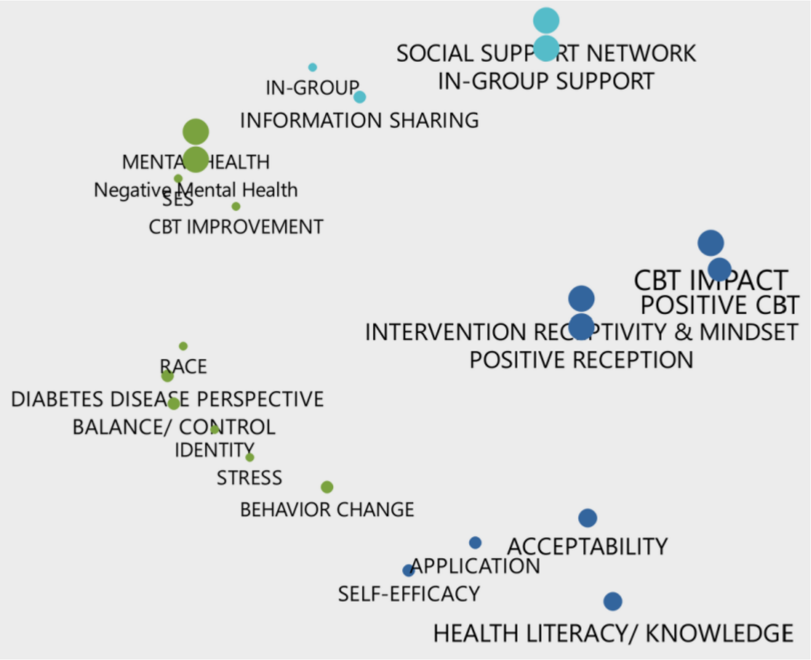
Qualitative Data Analysis

A systematic use of several qualitative methods allowed the conceptualization of patterns in the data and identifying thematic trends to analyze. The audio-recordings were transcribed verbatim and the transcriptions were imported into the MAXQDA qualitative analysis software. Memos were then written for each focus group transcript to gain familiarity with the information present in the entirety of the qualitative data set. Following the memo writing process, a codebook was developed based on the information gleaned from memos. The codebook included code names and definitions for the given codes and sub-codes. The data set included a transcript for the in-person group and a transcript for the web-based group, which were fully coded using the coding system found in Appendix B.

The MAXQDA Code Map Tool and Interactive Code Matrix Tool were essential in compiling the qualitative analysis of the focus group data. Once the focus group transcripts were fully coded, the coded segments were imported into the MAXQDA Code Maps Tool. The Code maps tool was then used to determine which codes were most closely related by creating visual code maps according to how frequently codes were coded together across both transcripts. The initial code map included every code to examine which codes were most closely related. This preliminary code map identified three separate groups of related codes, as shown in Code Map 1.

Code Map 1

Preliminary Code Map for Qualitative Analysis



Utilizing Code Map 1 as a guide, three subsequent Code Maps were developed using only the codes specified in the respective group. The group code maps were used to visually explore the relation of the codes within each group. Related codes were activated and imported into an excel sheet using the Interactive Code Matrix of MAXQDA. The coded transcripts were then preliminarily reviewed using an interactive matrix. The matrix was an excel sheet which organized segments of data from study participants with quotes that were coded together. The codes were inserted into the matrix using the “intersection of codes” function of MAXQDA. An analysis was conducted on the coded segments to explore the thematic trends identified in the Code Map step of the analysis.

Chapter 4: Results

Introduction

A randomized, parallel design trial was conducted at Emory's Dunwoody Family Medicine Clinic with twenty adult African American patients with uncontrolled type-2 diabetes. The study participants underwent a six-session behavioral health intervention Culturally Tailored CBT program. Participants were randomly assigned to biweekly in-person or web-based group sessions. Quantitative questionnaires assessing self-efficacy, perceived stress, anxiety, and depression, HRQoL and cognitive ability were administered at baseline and 3 months-time to evaluate treatment effects. SAS software was used to analyze the quantitative questionnaire. MaxQDA software was used to manage the focus group data.

Quantitative Results

Demographic Data

The study initially recruited 20 participants who were randomly assigned to either intervention delivery method: in-person or web-based. However, only 14 study participants successfully met study completion requirements. The six study participants who did not successfully complete the study either failed to attend a sufficient number of intervention sessions or were removed given missed follow-up visits for post-study data collection. Despite the loss of study participants, the two intervention groups retained an even distribution of seven participants per group.

On average participants were 56 years old, with a mean of 52 years of age for the in-person group and a mean of 61 years of age for the web-based group. Participant age ranged from 31 to 71 years of age. Overall, 79% (n=11) of participants self-identified as women, while 21% self-identified as men. Within groups, 71% (n=5) were women and 29% (n=2) were en for the in-person intervention group, while 86% (n=6) were women and 14% (n=1) were men for the web-based intervention group. In regard to marital status, 50% of participants reported being single, while 29% reported being married and 21% reported being divorced. In terms of educational background, 50% of study participants reported having a college degree or higher while the remainder of the participants reported indicated that they did not attain a college degree.

Participants reported a mean of 13 years since their diabetes diagnoses; 14% (n=2) with 0-5 years with diabetes; 14% (n=2) with 6-10 years with diabetes; 36% (n=2) with 11-15 years with diabetes; 29% (n=4) with 16-20 years with diabetes; 7% (n=1) with 20+ years with diabetes. The height and weight of participants were also used to measure each participant's Body Mass Index (BMI). BMI calculations revealed that 64% (n=9) of participants were obese, 21% (n=3) were overweight and 14% (n=2) were within a normal weight range for their reported height.

Refer to table 1 for demographic information of all study participants and intervention groups.

Scales

The Self-Management Resource Center's Self Efficacy for Diabetes scale results demonstrated a slight, statistically insignificant, decrease for all program participants. All participants had an average score of 7.21 at baseline, with a follow-up score of 7.10 at the conclusion of the study (t(26)=0.26; p-value=0.7979). The difference was deemed statistically insignificant given that the difference had a p-value greater than 0.05, resulting in a failure to reject the null hypothesis.

The Diabetes Distress Scale (DDS) results demonstrated decreased distress overall and in all four dimensions measured by the scale (emotional burden, physician distress, regimen distress and interpersonal distress). The mean overall distress score for all study participants at baseline was 2.46 which decreased to a mean score of 1.95 following the intervention (t(26)=2.62; p-value=0.021). The emotional burden score of all study participants had a mean of 2.94 at baseline which decreased to a mean score of 2.28 following the intervention (t(26)=2.59; p-value=0.0225). The physician distress dimension had a mean score of 1.70 at baseline which decreased to a mean score of 1.14 following the intervention (t(26)=1.80; p-value=0.0945). The regimen distress mean score for the study group was 3.11 at baseline and decreased to a mean score of 2.55 following the intervention (t(26)=2.60; p-value=0.0219). The final dimension, interpersonal distress, had a baseline mean study participant score of 1.66 at baseline which decreased to 1.38 following the intervention (t(26)=1.03; p-value=0.3203).

The Generalized Anxiety Disorder Scale demonstrated decreased self-reported levels of generalized anxiety across the entire study group. The mean baseline generalized anxiety score for all study participants was 6.36 and decreased to a mean score of 4.21 following the intervention (t(26)=2.22; p-value=0.0449). The decreased scores were significant in the severity of anxiety being reported based on the categorical information the scores represent. The overall group score of 6.36 at baseline categorically classified the group to have a mild level of generalized anxiety, given that the scale classifies a score of 6-10 as mildly severe. The final mean score of the group of 4.21 for all study participants categorically classified all study participants as having a low level of generalized anxiety, given that the scale classifies scores below 6 as mildly severe. Therefore, observed decrease in generalized anxiety scores is important given the shift from mild to low levels of anxiety for the study group as a whole. The overall GAD-7 results also demonstrated a statistically significant difference, given that the p-value was less than 0.05, rejecting the null hypothesis.

Depression was assessed using the Patient Health Questionnaire -9 (PHQ-9). The results demonstrated a slight decrease in reported depression as the study group average score decreased from 6.64 at baseline to 6.36 following the intervention (t(26)=0.26; p-value=0.8012). The difference was not statistically significant since the overall and group differences had p-values greater than 0.05, failing to reject the null hypothesis.

The Perceived Stress Scale was used to determine the degree to which study participants interpreted life events to be stressful. The study mean score for the entire study generally decreased with a baseline score of 15.14 to a mean score of 14.50 following the intervention (t(26)=0.32; p-value=0.7576). The in-person group mean scale scores demonstrated an increased perception of stress with a baseline mean score of 13.29 to a mean score of 15.43. This observed increase is important to note, given that it demonstrated a shift in the general level of perceived stress in the group from low stress (range 0-13) to moderate stress (range 14-26). The web-based group mean scale score demonstrated decreased perceptions of stress as the group mean score decreased from a baseline mean score of 17.00 to a mean score of 13.57 following the intervention. This observed decrease is pertinent, since it demonstrated a shift in the general level of perceived stress in the web-based group from moderate stress (range 14-26) to low stress (range 0-13). Although the mean score of all study participants demonstrated a general trend of decreasing, it is pertinent to note that the in-person intervention may have contributed to increased levels of perceived stress while the web-based intervention may have contributed to decreased levels of perceived stress. These differences were not statistically significant since the mean score differences for all study participants and within each group had p-values greater than 0.05, failing to reject the null hypothesis.

Participant health-related quality of life was assessed using the RAND-36 survey instrument, which evaluated eight health concepts: physical functioning, physical problems/ limitations, emotional problems/ limitations, energy/fatigue, emotional wellness, social functioning, pain and general health. Higher scores for each health concept category indicate a more positive perception of participant health-related quality of life, while lower scores indicate a more negative perception of health-related quality of life. The physical functioning health concept mean scores demonstrated increased health related quality of life. The overall mean score increased from 62.14 to 66.43 (t(26)= -0.90; p-value= 0.3854). The physical problems/ limitations health concept had an overall decreased health related quality of life, with differential results between intervention groups. The overall mean score of all study participants increased from 58.93 to 61.61 (t(26)= -0.28; p-value= 0.7856). The emotional problems/ limitations health concept mean scores demonstrated decreased health-related quality of life. The overall mean score decreased from 69.05 to 61.91(t(26)= 0.67; p-value= 0.5118). Reported levels of energy/fatigue concept mean scores demonstrated increased health-related quality of life. The overall mean score increased from 47.14 to 52.86 (t(26)= -0.99; p-value= 0.3414). The emotional wellness health concept had an overall increased health related quality of life. The overall mean score of all study participants increased from 74.00 to 74.29(t(26)= -0.08; p-value=

0.9387). The social functioning health concept mean scores demonstrated increased health related quality of life. The overall mean score increased from 61.61 to 75.00 (t(26)= -2.03; p-value= 0.0639).

The pain health concept mean score demonstrated statistically significant differences between baseline mean scores of the study and the scores collected at the end of the intervention. The mean score for all participants in relation to pain had a statistically significant increase from 51.07 to 70.00 (t(26)= -3.78; p-value= 0.0023). The mean score for the in-person group also demonstrated a statistically significant increase from 39.29 to 64.29 (t(26)= -0.28; p-value= 0.0139). The general health category data demonstrated a trend of increased health-related quality of life, with differential results between intervention groups. The overall mean score of all study participants increased from 55.00 to 55.71(t(26)= -0.13; p-value= 0.8952).

Cognitive ability of participants was assessed using the Montreal Cognitive Assessment (MoCA) scale. This assessment has a threshold score of 26, which is deemed as "normal" cognitive functioning when individuals have a score of 26 or higher. The overall study mean score increased from a subthreshold score of 25.29 at baseline to a score of 26.21 following the intervention (t(26)= -1.34; p-value= 0.2021). The subthreshold to above threshold increase in the study group overall may demonstrate a benefit to cognitive abilities by participating in the CBT intervention. Although the difference between the baseline and follow-up scores were not statistically significant, it is pertinent given that there is a shift from below "normal" to "normal" cognitive ability.

Refer to table 2 for a simplified representation of the information presented of the scale data for all study participants and intervention groups.

Table 1

CBT Intervention Participant Demographic Information

		Frequency	Percent	Mean	Frequency By Group		Percent By Group		Mean		Standard Error (In-Person/ Online)	95% CI (In-Person/ Online)	P-value (In-Person/ Online)
	Category	All Participants	All Participants	All Participants	In-Person	Online	In-Person	Online	In-Person	Online			
Age (Years)	> 55	5	36%	56.43	4	1	57%	14%	52	60.86	4.53	(-0.9756, 18.7756)	0.0732
	55 +	9	64%		3	6	43%	86%					
Number of Years with Diabetes	0 -> 5	2	14%	13.30	0	2	0%	29%	14.86	11.5	2.82	(-9.5111, 2.7968)	0.2576
	6 -> 10	2	14%		1	1	14%	14%					
	11 -> 15	5	36%		3	2	43%	29%					
	16 -> 20	4	29%		2	2	29%	29%					
	20 -> 25	1	7%		1	0	14%	0%					
Weight Status	Normal (BMI 18.5-24.9)	2	14%	33.42	1	1	14%	14%	35.77	31.07	4.39	(-14.2606,4.8606)	0.3052
	Overweight (BMI 25.0-29.9)	3	21%		1	2	14%	29%					
	Obese (BMI >/ = 30.0)	9	64%		5	4	71%	57%					
Gender	Man	3	21%	(-)	2	1	29%	14%	(-)	(-)	(-)	(-)	(-)
	Woman	11	79%		5	6	71%	86%					
Marital Status	Single	7	50%	(-)	4	3	57%	43%	(-)	(-)	(-)	(-)	(-)
	Married	4	29%		1	3	14%	43%					
	Divorced	3	21%		2	1	29%	14%					
Highest Level of Education	Less than a college degree	7	50%	(-)	3	4	43%	57%	(-)	(-)	(-)	(-)	(-)
	College Degree or More	7	50%		4	3	57%	43%					

Table 2

CBT Intervention Quantitative Scale Data

Scales	T2DM Mean at Baseline	T2DM Mean at Follow-Up	t(26) (Baseline/ Follow-Up)	P-value (Baseline/ Follow-Up)	Max Score
SMRC Self-Efficacy					10
All Participants (n=14)	**7.21**	**7.10**	**0.26**	**0.7979**	
In-Person (n=7)	**7.34**	**7.43**	**-0.16**	**0.8781**	
Online (n=7)	**6.94**	**6.77**	**0.47**	**0.6548**	
DDS Total					6
All Participants (n=14)	**2.46**	**1.95**	**2.62**	***** 0.021 *****	
In-Person (n=7)	**2.35**	**1.74**	**1.98**	**0.0948**	
Online (n=7)	**2.57**	**2.15**	**1.60**	**0.1613**	
DDS- Emotional Burden					6
All Participants (n=14)	**2.94**	**2.28**	**2.59**	***** 0.0225 *****	
In-Person (n=7)	**3.00**	**2.00**	**2.66**	***** 0.0373 *****	
Online (n=7)	**2.89**	**2.56**	**1.00**	**0.3539**	
DDS- Physician Distress					6
All Participants (n=14)	**1.70**	**1.14**	**1.80**	**0.0945**	
In-Person (n=7)	**1.39**	**1.07**	**1.12**	**0.3059**	
Online (n=7)	**2.00**	**1.21**	**1.42**	**0.2065**	
DDS- Regimen Distress					6
All Participants (n=14)	**3.11**	**2.55**	**2.6**	***** 0.0219 *****	
In-Person (n=7)	**2.71**	**2.11**	**1.47**	**0.1931**	
Online (n=7)	**3.51**	**2.99**	**2.80**	***** 0.0311 *****	
DDS- Interpersonal Distress					6
All Participants (n=14)	**1.66**	**1.38**	**1.03**	**0.3203**	
In-Person (n=7)	**2.00**	**1.33**	**1.92**	**0.1038**	
Online (n=7)	**1.33**	**1.43**	**-0.25**	**0.8087**	
GAD-7					21
All Participants (n=14)	**6.36**	**4.21**	**2.22**	***** 0.0449 *****	
In-Person (n=7)	**7.14**	**6.00**	**0.80**	**0.4521**	
Online (n=7)	**5.57**	**2.43**	**2.42**	**0.0519**	
PHQ-9					27
All Participants (n=14)	**6.64**	**6.36**	**0.26**	**0.8012**	

In-Person (n=7)	**7.29**	**7.71**	**-0.35**	**0.7398**	
Online (n=7)	**6.00**	**5.00**	**0.52**	**0.6202**	
PSS					**40**
All Participants (n=14)	**15.14**	**14.5**	**0.32**	**0.7576**	
In-Person (n=7)	**13.29**	**15.43**	**-1.37**	**0.2199**	
Online (n=7)	**17.00**	**13.57**	**0.95**	**0.3782**	
RAND 36-Physical Functioning					**100**
All Participants (n=14)	**62.14**	**66.43**	**-0.90**	**0.3854**	
In-Person (n=7)	**53.57**	**60.00**	**-1.19**	**0.2808**	
Online (n=7)	**70.71**	**72.86**	**-0.26**	**0.8032**	
RAND 36-Physical Problems Limitations					**100**
All Participants (n=14)	**58.93**	**61.61**	**-0.28**	**0.7856**	
In-Person (n=7)	**42.86**	**57.14**	**-0.88**	**0.4128**	
Online (n=7)	**75.00**	**66.07**	**0.92**	**0.394**	
RAND 36-Emotional Problems Limitations					**100**
All Participants (n=14)	**69.05**	**61.91**	**0.67**	**0.5118**	
In-Person (n=7)	**66.66**	**57.14**	**0.79**	**0.4574**	
Online (n=7)	**71.43**	**66.67**	**0.26**	**0.8049**	
RAND 36-Energy/Fatigue					**100**
All Participants (n=14)	**47.14**	**52.86**	**-0.99**	**0.3414**	
In-Person (n=7)	**45.71**	**58.57**	**-1.44**	**0.1996**	
Online (n=7)	**48.57**	**66.67**	**0.21**	**0.8442**	
RAND 36- Emotional Wellness					**100**
All Participants (n=14)	**74.00**	**74.29**	**-0.08**	**0.9387**	
In-Person (n=7)	**77.71**	**74.86**	**0.55**	**0.6036**	
Online (n=7)	**70.29**	**73.71**	**-0.66**	**0.5338**	
RAND 36- Social Functioning					**100**
All Participants (n=14)	**61.61**	**75.00**	**-2.03**	**0.0639**	
In-Person (n=7)	**50.00**	**69.64**	**-1.66**	**0.1483**	
Online (n=7)	**73.21**	**80.36**	**-1.19**	**0.2797**	
RAND 36- Pain					**100**
All Participants (n=14)	**51.07**	**70.00**	**-3.78**	***** 0.0023 *****	
In-Person (n=7)	**39.29**	**64.29**	**-3.43**	***** 0.0139 *****	
Online (n=7)	**62.86**	**75.71**	**-1.95**	**0.0985**	
RAND 36- General Health					**100**

All Participants (n=14)	**55**	**55.71**	**-0.13**	**0.8952**	
In-Person (n=7)	**52.86**	**55.71**	**-0.30**	**0.7709**	
Online (n=7)	**57.14**	**55.71**	**0.25**	**0.8119**	
MOCA					**30**
All Participants (n=14)	**25.29**	**26.21**	**-1.34**	**0.2021**	
In-Person (n=7)	**25.14**	**25.71**	**-0.55**	**0.6036**	
Online (n=7)	**25.43**	**26.71**	**-1.33**	**0.2328**	

*** Statistically significant difference as indicated by a p-value less than 0.05.

Qualitative Results

The themes that were identified with the code maps and interactive code matrix include: intervention group social support through information sharing, Mental Health and Personal Identities in Diabetes Understanding and Management, and Receptivity to CBT Intervention Positively Impacts Self-Efficacy through Improved Health Literacy.

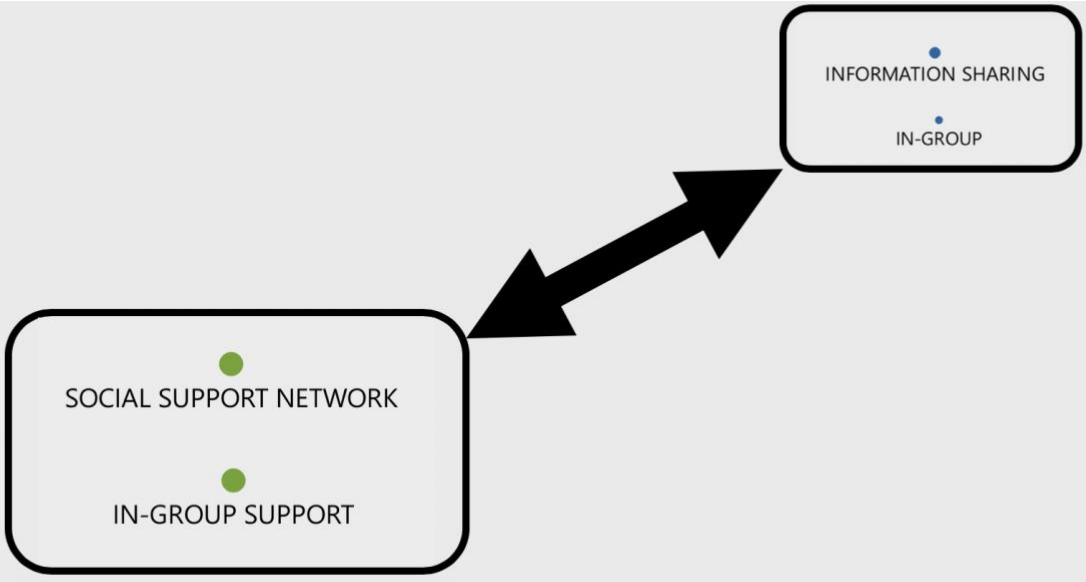
Intervention Group Social Support Through Information Sharing

Both focus group transcripts emphasized the importance of participating in the intervention as a means of social support which required intentional engagement with the intervention materials and between participants of the intervention. They revealed that the intervention allowed them to build a sense of community with other study participants. That community was essential in how they viewed diabetes, how well they engaged with the study materials and the level of support they had throughout the intervention process. Generally, participants expressed positive reflections of the communal aspect of the intervention and how they most benefitted from participating. Two general ideas were expressed pervasively in the transcripts: 1) participants benefit most by sharing and receiving information 2) participants were reassured by knowing that they were not alone in treating their diabetes.

In respect to information sharing, both focus groups expressed that there must be a willingness to share and receive helpful information from all study group participants. The codebook was designed to capture social support and information sharing experiences of study participants. Social support and information sharing contained sub-codes which were allowed the separation of support and information sharing within the group (in-group) and support and information sharing outside of study groups. For this thematic thread, social support and information sharing was only linked for interactions within study groups but not in terms of interactions outside of the group, as shown in Code Map 2 below:

Code Map 2

Social Support and Information Sharing



In considering the link between social support and information sharing, one woman in the in-person group notably stated, “I learned a lot of information from each one of them cause each one of us had something different.” She later emphasized that, “you will learn something. You will learn something from somebody.” In these reflections This participant communicated the importance of being open to the experiences of others. The information sharing could inform participants on how to change some behaviors moving forward. The use of the information shared was expressed by a participant of the web-based focus group when she stated, “during the week you try to remember something that was discussed or something that somebody else said that you may not have thought about just when you’re living your life." This reflection indicates that day-to-day behaviors could be influenced by the information learned from group interactions. Understanding the viewpoints of others and applying what was discussed in group sessions could provide alternative solutions to how participants managed their type-2 diabetes. Therefore, open-mindedness to information shared was a key aspect to participant interaction. The exchange of information described in the focus groups required participants to be willing to contribute to the information exchange as well. Another participant of the in-person group stated, "Also have something to bring to the table […] just bring something collective to the group that somebody else, maybe, can feed off of." The information sharing of the group was most enhanced when participants fully engaged in both receiving and providing their own experiences. These experiences provided others with useful coping mechanisms for type-2diabetes treatment. Therefore, participants viewed their willingness to receive information and share their own experiences as a means of support to improve the management of their type-2 diabetes.

In seeking support from focus group members, the sentiment that participants were in a community where they could be understood became an important thematic thread. One of the web-based group participants shared that sentiment when she stated, "the intervention made me feel like, well I'm not the only one." The study participants formed a sense of community through a shared experience of having type-2 diabetes. The shared experience provided participants with a sense of belonging which helped encourage group members to have a more positive outlook. In terms of positivity, a participant of the web-based group shared, "It's encouraging to know other people are going through the same things you're going through and sometimes I hear [somebody's] victory so that encourages me." The data suggests that participants are not only reassured by the communal experience of navigating diabetes management with others but were also inspired by the success they shared as a group. The sense of belonging mirrored the effect of information sharing, as participants were willing to adjust behaviors to improve diabetes management. The adjustment of behavior as a result of finding community was demonstrated when a participant of the in-person group shared that, "It gave you a better way to address your issue or situation that you're having cause you see somebody else going through what you're going through." The support gained from a shared experience spurred participant to treat their diabetes in novel ways with the new information gained. The new diabetes management techniques could be beneficial to participant outlook of treating diabetes.

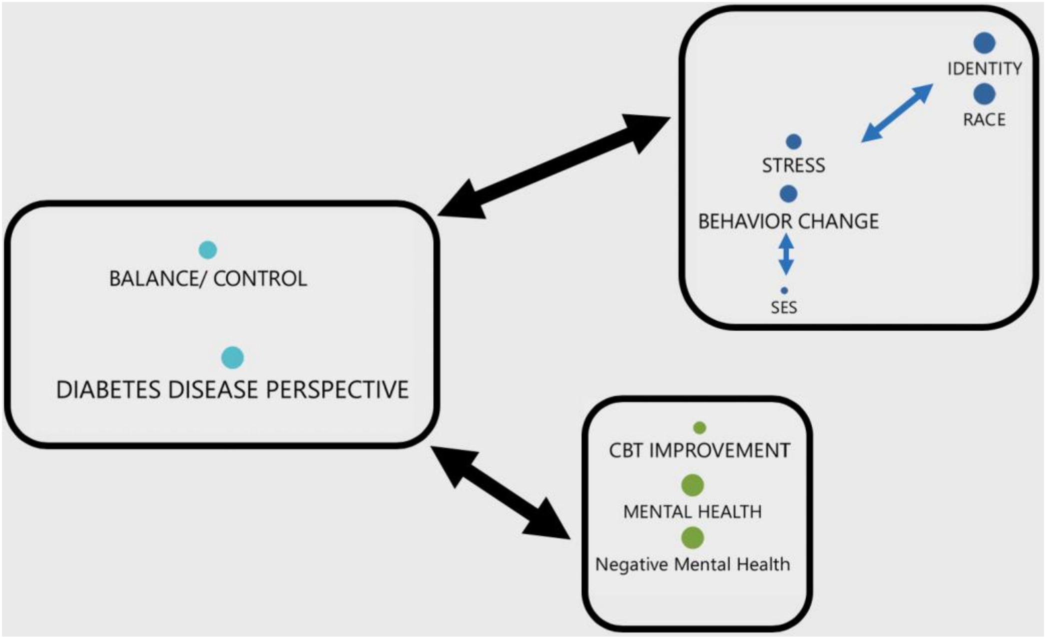
The community formed by study participants also provided study group members with accountability and positive reinforcement. One participant stated, "I know I was [going to] feel accountable when we had the meeting […] It definitely inspired me to do better," demonstrating a sense of responsibility to others in respects to her diabetes treatment. This expressed accountability positively contributes to the willingness of participants to engage in healthy behaviors toward diabetes treatment. The fact that participants were also in a space where they felt comfortable enough to honestly share instances of unhealthy behaviors is crucial in understanding the environment that was promoted by the CBT intervention. The sense of responsibility toward others was not the only driving force in the motivation to incorporate healthier diabetes management behaviors for study participants. A participant of the in-person group introduced the positive reinforcement present in the group when she stated, : "when I told [the group] that I was going to chic-fil-a, you know treat myself […] they did not criticize me [or] come down on me. [They told me to] just do it in moderation." A mechanism for a more sustainable set of behavioral change that was often mentioned in the transcripts is the idea of moderating the intake of unhealthy foods. The relationship between information sharing and participant in-group social support network can be observed through the Code Map 2, providing a visual conceptualization.

Mental Health and Personal Identities in Diabetes Understanding and Management

The link between the participant perception of diabetes, mental health and personal identities are visually conceptualized in Code Map 3:

Code Map 3

Disease Perception, Mental Health and Identities



The box in the top right demonstrates the link between participant identities (race and SES) and the stresses associated with the behavioral changes required for healthier diabetes management. The box on the bottom right portrays the link between mental health challenges and improved diabetes management gained from intervention materials. The box on the left side of the diagram demonstrates that participant perspectives of diabetes were closely related to balancing the challenges of diabetes management. The links between the boxes demonstrated the overall relationship between participant identities and mental health perception contribute to the participant perspectives concerning diabetes management through balance and control. The observed visuospatial relationships shown in Code Map 3 informed the analysis of coded segments present in the theme: Mental Health and Personal Identities in Diabetes Understanding and Management.

Study participants emphasized that the stresses associated with being African American or Black were unique and helpful to explore in gaining a better understanding of diabetes management. A participant of the in-person group specifically stated, “African Americans may have some other life stressors that other classes may not have […] what we learned can be applied to anybody […] dealing with some form of [diabetes]. [African Americans] deal with it differently, but we’re dealing with it.” The idea of stressors for African American people was further supported when another participant of the in-person group said, “I think that African American people, I think that we’re up under a lot of stress.” The societal stress identified to uniquely impact African Americans was a pertinent aspect of diabetes disease management the group felt the need to prioritize during discussions. Identifying the stresses associated with race was an important step in understanding underlying influences that contribute to effective behavioral changes. The importance of understanding underlying stressors was most clearly expressed when a participant of the web-based group stated, “I would’ve went to eating […] comfort food […] and then I thought […] You know better. You just had the session on stress. […] That particular session did have an effect on what I ate during that stressful situation […].” As a group, the participants indicated that stress is a part of their shared experience as African Americans. This acknowledgement contributed to an awareness that contributed to positive behavioral changes for improved coping skills to promote healthier diabetes management. Race was not the only pertinent identity that participants discussed in relation to diabetes management. A participant of the in-person group reflected on how he perceived diabetes when he stated, “The whole management […] between medications and equipment […] […]in terms of healthy eating […] It can become taxing on the pocketbook.” The costs associated with proper diabetes control links SES to behavior change and stress.

Participant mental health was also a contributing factor which was also shown to heavily impact how participants perceive diabetes. Consequently, the perception of diabetes in terms of mental health contributed to the paradigm participants have of diabetes as a disease and the treatability of diabetes. One participant expressed that she had a diminished sense of quality of life when she said, “sometimes I feel like my life has been reduced to zero with the challenges that you have to go through. I feel a reduction in my life, and does it ever get any better?” Another participant reiterated the sentiments when she said, “: I would say depressed sometimes […] living with diabetes.” The participants’ reflections demonstrated that mental health was negatively impacted by having diabetes. Their despair seemed to be slightly mitigated by the CBT intervention. Later in the discussion a participant stated, “Well the intervention […] made me realize that I wasn’t the only one […] but it's just hard." Despite expressing that living with diabetes is difficult, the social network of people living with diabetes contributed positively to this individual's outlook on diabetes management. Simply finding a group in which their experience provided an outlet of negative emotions and an improved perspective of diabetes. There was a particularly pivotal moment when the same participant stated, "Well it would be helpful if I had some kind of publication […] that said instead of this […] use this. You know, something […] you can have instead." A clear shift in focus occurred in this participant as the possible benefits that intervention materials could provide instilled a sense of control through improved diabetes knowledge.

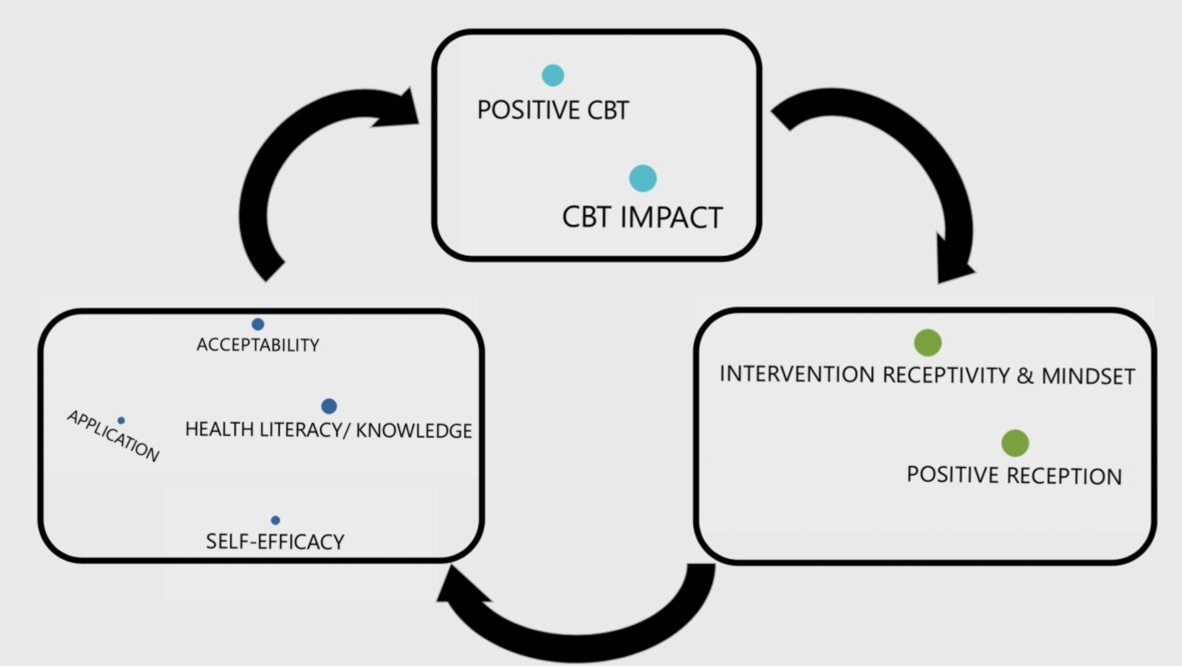
The data demonstrated how participant identities of race and SES informed the stresses associated with the behavioral changes required for healthier diabetes management. The mental health challenges of managing diabetes were also shown to be linked to a lack of effective strategies of managing diabetes with reflections of how the CBT intervention improved management techniques. Generally, participant reflections offered insight into how mental health and personal identities contribute to the participants' paradigm of diabetes management.

Receptivity to CBT Intervention Positively Impacts Self-Efficacy through Improved Health Literacy

Receptivity of participants were shown to be linked to a positive impact of the CBT intervention improving key aspects of diabetes management, as shown in the visual conceptualization of these links in Code Map 4:

Code map 4

Receptivity, Impact and Health Literacy



The code map demonstrates that participant receptivity to study materials was linked to knowledge retention and improved participant health literacy. The learned self-management techniques improved participant self-efficacy contributing to positive health outcomes of the CBT intervention. The recognition of positive health outcomes further promoted participant reception of presented study materials, motivating them to be more receptive to new information; restarting the observed cycle. Overall, the information obtained from the study data revealed a cyclical relationship between participant receptivity, participant health literacy and the impact of CBT.

Receptivity is an important theme which captured positive dimensions of how study participants received study materials. Limited negative reactions to intervention information were shared in the focus group data. Several participants of the in-person group all described the CBT sessions to be “eye-opening” and “educational.” One of these participants expanded on participant receptivity when he stated, “Come in with an open mind and just be receptive to information. Don’t, don’t come in already […] thinking […] ‘they’re [going to] tell me what I can’t have.’” The sentiment that positive reception was essential to a more successful participation experience was shared by many study participants. Both verbal and non-verbal agreement was observed in terms of the importance of open-mindedness for an improved intervention experience.

The positive reception of study materials resulted in an improved outlook on living with diabetes with participants in data across both intervention groups, priming participants to retain the health information; improving health literacy. Resultantly, participant self-efficacy improved as they accepted and applied the knowledge shared with them. The benefit of improved health literacy was most readily observed when a participant of the in-person group said, “You can go at it a different route, cause now you have more knowledge about what you’re dealing with”, identifying the first step to diabetes management as health education. Another participant of the in-person group expanded on the idea in stating, “I have started applying a lot of stuff that we learned in class to my personal life.” This reflection demonstrates a progression from accepting study materials to the intentional application of the knowledge gained for improved health outcomes. Knowledge manifested into self-efficacy as participants utilized the tools given. A participant of the web-based group acted on the information shared when she, “specifically went to the store and started buying vegetables instead of buying other things.” Therefore, intervention materials were accepted by the participants and subsequently applied in changing detrimental behaviors to healthy alternatives. The positivity associated with the use of the knowledge shared further supported receptivity, inspiring participants to continue to learn in hopes of further improving their health. A participant of the web-based groups shared, “I have the power of choice and now that I know I have options I can do what I know is right instead of being comfortable.” By being open-minded and open to the discomfort of change, participants were able to understand their disease and adjust accordingly to improve their circumstances.

The impact that the study had on participants was described positively. Participants explicitly identified recognition of life stressors and informed decision-making as mechanisms to maintain a positive outlook on diabetes. A participant of the web-based group mentioned, “If I can recognize [the problem] I can apply those things I learned instead of reacting as if it was the first time, I heard it. I was prepared to deal with the situation.” This reflection demonstrates how the study impacted participant views on diabetes in respects to difficulties that may arise and provided them with the tools to appropriately respond. The intervention increased awareness to life stressors to promote healthy coping strategies beneficial to diabetes management. The improved ability to cope supported the second mechanism to maintain a positive outlook: informed decision-making. A participant of the in-person group introduced this idea when she stated, “It gave you a better way to address your issue […] I could try that route that they took, and it might help.” Having a greater breadth of information to operate from provided participants with multiple ways of coping with diabetes management. The array of choices allowed them to consider which mechanism could best serve their goals and make an informed decision on how to proceed when an issue presented itself. The same participant further clarified how these options are useful when she stated that they helped, “To make better choices or better decisions when you’re facing certain situations.” Ultimately, the study positively impacted how diabetes-related problems were assessed by participants, positively impacting how participants chose to respond. The thread described, introduced a cyclical trend of the positive reception of information which allowed participants to retain the learned information to be self-efficacious and apply it toward positive health outcomes. The improved health outcomes further promoted receptivity to the information shared, perpetuating the cycle shown in Code map 4.

Therefore, the code map revealed an interconnected cycle of positive CBT reception, followed by improved knowledge and self-efficacy resulted in the positive outcomes expressed by participants.

Chapter 5: Conclusions, Implications & Recommendations

Introduction & Study Summary

This study explored the experiences of African Americans with type 2 diabetes and captured their perspectives concerning Culturally Tailored CBT as an intervention technique in managing their diabetes. An analysis was performed to determine how the intervention was received by participants and quantitative baseline and follow-up data was analyzed to determine if positive or negative perceptions were supported by health-related assessment tools. The study was conducted by independently assessing qualitative and quantitative data to gain an understanding of the implications CBT interventions have for Black or African American people in the U.S. The data yielded favorable results for how African American patients perceive the Culturally Tailored CBT in a clinical setting. Results also illuminated two core concepts: 1) Disease perception and perspectives on quality of life are interrelated 2) social support gained from CBT interventions relate to perceived distress associated with diabetes management.

Discussion of Key Results: A Concurrent Analysis of Qualitative and Quantitative Data

Core Concept: Quality of Life and Disease Perceptions

When evaluating the overall quality of life reported in study data, increased levels of reported health-related quality of life in seven of eight health concepts were documented. Of the seven concepts that reported increased quality of life, one concept (pain), demonstrated a statistically significant increase following the CBT intervention. The emotional problems/ limitations concept differed since it had decreased health-related quality of life across the entire study, which was also observed in each intervention group as well. Management of diabetes requires a level of understanding of the factors that contribute to its development and disease progression. The CBT intervention allowed participants to reflect on how their personal identities contributed to the disease and how the cultural influences of their identities impacted their overall health.

The health concept of Pain had a statistically significant increase following the study's intervention for all study participants (p-value = 0.0023) and the in-person intervention group (p-value=0.0139). These results indicate more positive perceptions of health-related quality of life when considering pain associated with diabetes. The Receptivity Thematic Thread (Code Map 4) revealed that participants were able to gain an increased awareness of life stressors associated with their race and SES. In gaining this awareness study participants were able to develop healthy coping strategies to better manage their diabetes. By being open-minded to effectively adjust their behavior, participants were able to improve how they live with diabetes. A more holistic framework was developed by participants for diabetes management in relation to racial stressors and associated costs. Considering both quantitative and qualitative results, there is a possibility that more positive perceptions of health-related quality of life may be linked to improved awareness of how race and SES impact participant diabetes treatment. In developing coping mechanisms through CBT learning, participants may be able to effectively address difficulties faced in managing their diabetes, improving their perceived quality of life.

The qualitative data demonstrated that SES is a factor which may impact accessibility to medications and healthy foods. These additional costs can impose a financial burden which contributes to higher levels of stress due to financial hardships. Participant reflections, therefore, demonstrated how race and SES can impact behavioral changes that would allow for effective diabetes control. The interaction of identities and stress when considering behavioral change to improve diabetes outcomes was identified as a quintessential aspect of understanding the perspective of African American patients.

The emotional problems/ limitations concept of the RAND-36 survey demonstrated decreased health-related quality of life for the entire study and in both intervention groups. When coupled with the results of the depression scale there exists a congruence in the observed trend in which participants have decreased health-related emotional capacity with mild levels of depression. A key concept identified in the Mental Health, Personal Identities and Diabetes Management Thread (Code Map 3) was that diabetes disease management must consider the societal stressors unique to African Americans. The stresses of being African American could contribute to a level of despair indicated by the quantitative depression and quality of life scales. Although participant awareness of stressors may help with coping mechanisms for better diabetes management, it may also contribute to an increased sense of cynicism. This increased sense of cynicism may contribute to the increased emotional problems experienced by study participants, and persistent mild levels of depression reported throughout the study. Having access to health information and using that health information to mitigate poor eating habits seemed to be a feasible solution for participants' expressed difficulties. The qualitative data indicates that providing a space with support from a social network which disseminated pertinent health information could mitigate the mental health difficulties participants faced. The group-based design of the CBT intervention may be beneficial to patients who have experience the comorbid effects of diabetes and depression.

In considering how the qualitative strand and quantitative strand relate, there seems to be a link between health-related quality of life, mental health and disease perception. The CBT intervention offers participants a skillset to cope with the stress of diabetes management. The improved manageability of the disease may alleviate stress, which in turn improves perceptions of diabetes as a chronic disease. Although aspects of life quality may have improved following the CBT intervention, participants are still tasked with the daily treatment of a chronic disease. The reality of facing diabetes as African Americans may contribute to the consistently mild levels of depression observed throughout the study. The study may indicate improvements in disease management outlook, but the stresses associated with diabetes management may still contribute to a decreased emotional capacity to cope with diabetes in terms of mental health. These mild levels of mental health difficulty may have been alleviated by the presence of a social support network through the CBT intervention. Finding a community of support may help with the diminished emotional capacity observed in the study.

Core Concept: Distress & Social Network Support

DDS results confirmed decreased overall distress and decreased distress in all four of the scale's dimensions: Emotional Burden, Physician Distress, Regimen Distress, and Interpersonal distress. The regimen distress and emotional burden dimension results were the only dimensions with mean scores that were greater than or equal to 3.00. This threshold helps determine if participants exhibited distress levels worthy of clinical attention. What is most interesting about these results is that both dimensions had final mean scores below the mean score threshold for clinical attention. The overall score of the emotional burden dimension had a statistically significant difference between the baseline mean score (2.94) and the follow-up score (2.28), with a p-value of 0.0225. The in-person group also had a statistically significant difference for the emotional burden dimension between the baseline mean score (3.00) and the follow-up score (2.00) , with a p-value of 0.0373. The regimen distress dimension also had a statistically significant difference between the overall baseline mean score (3.11) and the follow-up score (2.55), with a p-value of 0.0219. The online group for regimen distress also had a statistically significant difference between the baseline mean score (3.51) and the follow-up score (2.99) for the web-based group, with a p-value of 0.0311.

Both dimensions were above the threshold for clinical significance and would have warranted clinical attention. It is intriguing that the observed differences resulted in final mean values that were below the clinical attention threshold for distress. These results indicate that CBT interventions may be beneficial in alleviating distress associated with the emotional burden of diabetes, which may be more beneficial when delivered in an in-person setting. The results also indicate that CBT interventions may alleviate distress associated with diabetes management regimen, which could be more effective on a web-based platform.

The Mental Health, Personal Identities and Diabetes Management Thread (Code Map 3) revealed that participants had positive outlooks when placed in a social network of similar experiences. The social network provided an outlet for participants to release negativity and find useful solutions to living with diabetes. Qualitative data from the in-person group demonstrated that group members may have had a level of comfort which allowed them to share when they would be engaging in unhealthy eating behaviors. The group's response was crucial in supporting participants, as they encouraged each other to approach diabetes treatment with a mindset of moderation. The occasional consumption of unhealthy foods allowed for more consistent healthy eating behaviors to be practiced over time. The data emphasized that the intervention promoted positive reinforcement and group accountability, allowing participants to be comfortable and honest with one another about their diabetes management. Ultimately, participants were able to build a social support network by candidly sharing information while engaging in the CBT intervention.

Providing health information from trained professionals in the social networks seemed to mitigate the health literacy disparity the participants faced. In considering the qualitative and quantitative threads of data, the statistically significant decreased distress levels may be linked to the social support network participants gained during the intervention. By sharing information in support of one another, study participants may have decreased the regimen distress associated with diabetes management. Having a space to discuss the negativity associated with the disease could provide an emotional outlet to decrease the associated emotional distress participants were experiencing at the beginning of the study. Creating a communal component to diabetes management may be an effective method to improving the outlook of African Americans and mitigate the associated distress stemming from living with diabetes as a member of this racial group.

Strengths and Limitations

This study's mixed-methods approach provided a means of exploring diabetes management in African Americans; a group disproportionately impacted by this chronic disease. This pilot study's design offered a novel approach which considered how CBT could be administered using two different platforms (in-person and web-based). The study most pertinently addressed the sparsity in the available literature by explicitly considering the perspectives of African American people in chronic disease management. By applying CBT to this population, unique aspects of health education and chronic disease management were considered to aid participants in promoting positive health outcomes. The study team was able to equip participants with knowledge about psychological, behavioral, psychosocial and social determinants of health for a more wholistic treatment plan. Generally, participants were empowered through information sharing and empowered in finding social support in other study participants.

Qualitative and quantitative study design elements limited the study's power, depth and generalizability.

Quantitatively, the power of the study was severely limited by the sample size available (n=20). The limit associated with sample size was further compounded by the decreased sample size available to be analyzed at the end to the study (n=14), due to loss to follow-up. Although there were some significant differences found between baseline and follow up data, the results may have been severely skewed by outlier data present in the information collected from study participants. The quantitative date was also mostly self-reported scales, which are subject to be skewed by participant bias. Awareness that the information reported is being used for the purposes of research may be a contributing factor to possible reporting bias by study participants as they responded to scales, especially if the scales were geared toward assessing emotionally relevant information. Social desirability bias may have stemmed from the self-reported data given that many of the scales assessed concepts related mental health, which is often stigmatized in Black or African American communities. The possibility of bias and socially desirable responses could negatively impact the internal validity of the findings, as well as the generalizability of study findings to the target population.

Qualitatively, the study design contained limitations related to the depth of the available data and the sampling frame. Qualitative analysis invites researchers to identify trends in a saturated data set. Only two focus groups of five participants were conducted resulting in only half of the initial study group to contribute to the qualitative data. This attrition in study participants further limited the information collected from study group members, diminishing the richness and depth of available data. The information provided by focus group participants may have come from participants who are more likely to actively engage with the study. Afterall, the focus groups were conducted on a voluntary basis and were not part of the original study design, given that they were an IRB amendment. Therefore, the data may only reflect viewpoints of active and engaged participants who responded more positively to the intervention. An unintentional bias may have been introduced toward more positive reflections as less engaged individuals may not have been presented to contribute negative experiences associated with the CBT intervention. Instead, participants with less favorable views may have opted out of focus group participation, due to a decreased likelihood of engagement. These design limitations may have resulted in a lack of data saturation and a weakened thematic analysis.

Another limitation to the design of the study lies in the sampling frame used. The investigators only recruited Black or African American people in the Emory Healthcare network. The nuances of different healthcare environments may heavily influence experiences associated with qualitative data. The Emory Dunwoody Clinic is part of a private healthcare system in a Southern state, which may not necessarily be representative of the standard level of care that Black or African American people may receive. The limitation lies in the built environment and access to healthcare that these study participants may have had when compared to other healthcare systems. In a less resource-rich healthcare system, diabetes care may be limited in its capacity to provide comparable resources which may contribute to differential health outcomes.

Implications & Recommendations

The limitations of study designs most impacted the generalizability of study results and lacked a means of controlling bias introduced into study findings. Study design factors which most limited findings were the size of the study sample and recruiting methods associated with the sample of participants used. Patients from Emory’s healthcare system within the state of Georgia are highly specific, hindering the study’s generalizability. Expanding the study’s sampling frame to include a wider range of the Black or African American population from different healthcare systems would diversify the lived experiences of participants. This diversification would bolster the collected data, contributing to greater saturation in the available qualitative data and a greater degree of quantitative rigor. The relevant experiences to Black or African American individuals with type-2 diabetes concerning Culturally Tailored CBT would be better understood with a more representative sampling frame.

Conclusions

The study has demonstrated that a holistic approach to type 2 diabetes care is positively received by Black or African American people. The benefits of social support through intervention group interactions, and a stronger sense of participant self-efficacy due to health education and information sharing were gleaned from study results. Participants emphasized positive receptivity to CBT as a viable intervention technique to promote wholistic treatment plans for type2 diabetes management. Study results also supported prior findings that mental health is an important factor in diabetes treatment and management, supporting the idea that diabetes is a multifactorial disease. Given the complex array of interacting components to diabetes, a more comprehensive treatment plan, like CBT, may be useful in promoting healthy diabetes self-management.

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Appendices

Appendix A: Interview Guide

Purpose

An in-depth analysis of study participants will provide a means to better understand the perceptions and experiences of African American patients who have undergone Cognitive Behavioral Therapy. The purpose of the of the focus groups are to explore those experiences for more cultural awareness about African American participants in ragrd to this intervention. These focus groups will adress the following questions through semi-strutured group discussions with study participants.

Introduction & Consent

Hi, my name is Max Cornely and I am a first-year Emory Rollins School of Public Health student with a concentration in Behavioral Sciences and Health Education. As a team member of this Cognitive Behavioral Therapy Diabetes study, I thought it would be valuable to obtain your perspectives about this intervention technique and how it has contributed to your health as you manage your type-2 diabetes. More specifically, I think your perspectives as African American patients is vital to future research. Thank you for taking the time to speak to me about your experiences for the purpose of furthering our research efforts, and gaining a better understainding of your ecperiences.

This will be a semi-structured group discussion where I ask you open-ended questions which you may choose to answer as openly as you wish. The discussion will be about 30-45 minutes in length and should allow us enough time to expand on your experiences and provide insight.

I would like to take this time to emphasize that this group discussion should be kept confidential by participating group members. Please refrain from sharing or discussing any intformation that is shared during this discussion with anyone that is not present today. Also, any information that you share will not be linked to you, since we will not be using your name or any other information that may be used to identify you The We will be using an ID number assigned to you at the beginning of the study instead of your name or any other information that may be used to identidfy youThe de-identified information may be shared in published data from this research study. If you share any information that you feel may be used to identify you, please let me know. I will be sure to take further steps with the study data to protect your identity as a study participant.

This group discussion may result in us discussing some sensitive and personal topics related to your personal health. You do not have to share anything that may make you uncomfortable. You may also opt out of any questions or stop participating at any time. Your participation is completely voluntary. Do you have any questions?

If you permit, I would like to record this conversation. I will be the only one who has access to the recording, and it will be stored on my personal password-protected computer. It will also be erased once the discussion is transcribed. Do I have your permission to record?

Thank you. Let's get started.

Intro

1. Let's start with you all telling me a bit about yourselves. Please tell me your preferred name and share one word that describes your experience with diabetes, and why you chose that word.

   I'll go first. My name is Max, and I am here today…..

Key Questions: Compatibility, Complexity, Observability and Relative Advantage of a Culturally Tailored Cognitive Behavior intervention (CT-CB) for African American patients

1. **What was your experience with the cognitive behavioral therapy intervention?**
   a. *Probe: What did you like about it? What didn't you like about it?*

2. **Have you ever participated in a similar intervention? Please tell us more.**
   a. *Probe: Did you prefer aspects of the other intervention more? Less? How about this intervention?*

3. **What was confusing about the cognitive behavioral therapy intervention? What didn't make sense to you?**
   a. *Probe: What about it was confusing? How could we have better communicated with you?*

4. **How has the cognitive behavioral therapy intervention impacted how you manage your diabetes, if at all?**
   a. *Probe: Did you feel like you had more control of your diabetes? Did you feel like you had less control of your diabetes?*

5. **How did the material presented from the therapy align with your daily activities?**
   a. *Probes: Is it easy to incorporate? What is difficult to incorporate? How would it have been easier to make it as part of your daily life? Have you done something like this before?*

Key Questions: Cultural Sensitivity of the Study

1. **How could the study improve in making the intervention and experience more comfortable for African American patients?**
   a. *Probe: Did you ever feel uncomfortable? Why?*

2. **How did study staff make you feel during the intervention?**
   a. *Probe: Words of encouragement? Attitudes? Demographics?*

3. **How did the staff account for your beliefs and identity when presenting the intervention material?**
    a. *Probe: Words? Actions? Intervention specific components?*

Closing Questions/ Conclusion

1. **If you could advise other African American patients on how to navigate these experiences what would you say?**
2. **Do you have any final thoughts you would like to share?**

That concludes the group discussion. I would like to thank you for taking the time to participate. Your responses will be very valuable as I explore your experiences with the Cognitive Behavioral Therapy Intervention, and how it is received by African American patients. If you have any questions about the project, please feel free to contact me.

Appendix B: Code System

Code #	Code	Sub-code	Definition	Example quotes
1	DIABETES DISEASE PERSPECTIVE		How participants view diabetes as a disease and how they describe it when discussing the intervention. Discussions about how diabetes relates to them are also useful.	“This whole experience is just a rollercoaster. Every day you do everything right, you take your blood sugar levels and its all over the map”
1.1		BALANCE/ CONTROL	When participants discuss dealing with aspects of their lives in relation to diabetes. Reference could be to diabetes as a disease, navigating the learning curve of diabetes, or managing diabetes.	“Sometimes I’m good, sometimes I’m not so good. Sometimes the experiences are good, sometimes they’re not good.”
1.2		BEHAVIOR CHANGE	Mention of action taken to improve self-management of diabetes which include a behavioral change by participants.	“In my life I found out that I have a lot more power to choose what I do”
2	IDENTITY		Any mention of how participants view themselves or how society may view them.	“many of us could relate to it, you know, we’ve experience it or we’re living it”
2.1		SES	Experiences that participants describe which are related to the individual’s socioeconomic status (positive or negative). This may include costs of treatment and living expenses.	“It can become, it can become taxing on the pocketbook”
2.2		RACE	Any mention of race as a social construct, whether related to personal identity of the participant or in relation to society in general.	“So, this disease impacts African Americans somewhat differently based on culture”
3	HEALTH LITERACY/ KNOWLEDGE		Mention of information learned from the CBT intervention.	“You know, the materials made you think about things that you hadn’t thought about”
4	COPING		Mentions of how participant has been able to handle the stresses of diabetes management.	“that particular session did have an effect on what I ate during that stressful situation”
5	INFORMATION SHARING		Sharing of information with others concerning diabetes management and coping mechanisms.	“I learned a lot of information from each and every one of them”
5.1		IN-GROUP	Sharing of information in a given treatment group.	“And we learned some things from each other

				[Group members verbally agreeing]"
5.2		PUBLIC	Discussions of disseminating information to the public.	"They gotta get it out. In, you know, be it in spurts or increments"
6	SELF-EFFICACY		Reflections on how participants have taken action to improve their health when managing their diabetes as a result of the information learned from the CBT intervention.	"So I specifically went to the store and started buying vegetables instead of buying other things"
7	ACCEPTABILITY		Mentions of how well received the information was by the group and how they believe it would be received by other African American/ Black people.	"I think the materials were really helpful."
7.1		APPLICATION	Mention of acceptability of material that leads to application of learned material.	"Umm, problem solving, you know, um, and just kind of trying to give you options and things to think about, uh, day-to-day"
8	AGREEMENT		When participants express that they have had the same, or similar, experiences. Verbal and non-verbal cues in transcript should be coded.	"I think because I feel like it's more people that are around that are going through some of the same things."
8.1		CULTURAL AGREEMENT	Having the same cultural background or similarity in cultural practices.	No Data Coded.
8.2		TREATMENT AGREEMENT	When participants express similar experiences in relation to treatment (good or bad)	"They've been eye opening. They've been, they've been very direct [Other participant: Mhm hmm] and it's kind of made me think out of the box"
9	SOCIAL SUPPORT NETWORK		Any mention of being encouraged or finding refuge from others.	"We really had a great group"
9.1		IN-GROUP SUPPORT	Encouragement or refuge from the intervention group.	"Well the intervention made me feel like, well I'm not the only one"
9.2		AT-HOME/ SOCIETAL SUPPORT	Encouragement or refuge from people outside of intervention group.	No Data Coded.
10	MENTAL HEALTH		Any indication of psychological status from study participants.	"I feel a reduction in my life, and does it ever get any better?"

10.1		POSITIVE MENTAL HEALTH	Any indication of positive experiences related to the patient's state of mind and diabetes management.	“help you evolve, you know, into a better person. So, it’s been, it’s been real good.”
10.2		NEGATIVE MENTAL HEALTH	Any mention of desperation or loss of hope from participants.	“I would say depressed sometimes.”
11	STRESS		Any mention of psychological or emotional distress from participants.	“And something that really just “stress me out , and automatically I would’ve went to eating something that, you know, people say comfort food or whatever. [
12	INTERVENTION RECEPTIVITY & MINDSET		Discussions about how well received study materials and intervention was by participants and what their state of mind was.	“It’s making me feel like I can grow, you know, dealing with them and they’ve changed a lot of things, you know, as far as medication and all.”
12.1		POSITIVE RECEPTION	Discussions of when intervention materials were well received.	“One thing it helped me with is periodically I know I was gonna feel accountable when we had the meeting, so it kind of inspired me to do better”
12.2		NEGATIVE RECEPTION	Discussions of when intervention materials were not well received.	No Data Coded.
13	ENVIRONMENTAL & ECOLOGICAL FACTORS		Discussions about how participant environment affected the use of materials from the study intervention by participants.	“Go to a cooking class and learn how to make the foods that you like in a different way”
14	CBT IMPACT		Any mention of how CBT has contributed to treatment of disease or how the information has been received by participants.	
14.1		POSITIVE CBT	How CBT has contributed to participants positively.	“It was helpful.”
14.2		NEGATIVE CBT	How CBT has contributed to participants negatively.	No Data Coded.
14.3		CBT IMPROVEMENT	How CBT can be improved.	“I think that we could’ve gotten suggestions. Recipes or things to avoid.”