

GOODE, PANDORA, Ph.D. The Effect of a Diabetes Self-Management Program for African Americans in a Faith-Based Setting. (2016)  
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Diabetes is a lifelong chronic disease that requires daily management. Diabetes is the leading cause of blindness, kidney failure, and non-traumatic lower limb amputations. African Americans are more likely to suffer from diabetes related complications than any other race. The purpose of this study was to test a six-week culturally tailored diabetes self-management program for African Americans. The diabetes self-management intervention was conceptualized as the foundation that supported the changes in diabetes knowledge, self-efficacy, symptom management, and self-management activities. Thus, the specific aim of this study was to increase knowledge about diabetes, self-efficacy, symptom management, and self-management activities in African American adults diagnosed with diabetes.

A one-group pre- and post-test was the design used in this study. The six-week intervention focused on areas of diabetes self-management based on the American Diabetes Association (ADA) guidelines: (a) introduction to diabetes, (b) healthy eating, (c) being active, (d), medications, (e) glucose monitoring and complications, and (f) symptom management. An African American nurse led the intervention. Adult African Americans with diabetes who were age 18 years old and older were recruited from two predominantly black churches in the south-eastern part of the United States.

Sessions were held at each church directly after the morning and evening worship service. A total of 32 participants were recruited and 28 participants completed the six-week program. Health history and biomarkers (BMI, HBA1C) were measured at

baseline. The major concepts were measured at baseline and post intervention using the Spoken Knowledge in Low Literacy Diabetes (SKILLD) scale, Diabetes Empower Scale-Short Form (DES-SF), Diabetes Symptom Checklist- Revised (DSC-r) scale, and the Summary of Diabetes Self-Care Activities (SDSCA) scale. At baseline, many persons had low diabetes knowledge, self-efficacy, symptom management, and diabetes self-management activities.

Findings revealed statistically significant positive improvements in diabetes knowledge, self-efficacy, symptoms management, and diabetes self-management activities from pre-intervention to post- intervention. Study participants gained an awareness of the need or diabetes self-management education. Designing and implementing culturally tailored diabetes self-management programs in faith-based settings are practical and necessary to reduce the disparity in diabetes for African Americans.

More diabetes self-management studies are needed that target, recruit, and retain an adequate representation of African Americans. Also, more research is needed regarding African American cultures and learning styles so that programs can modify learning objectives to meet their needs.

THE EFFECT OF A DIABETES SELF-MANAGEMENT PROGRAM FOR  
AFRICAN AMERICANS IN A FAITH-BASED SETTING

by

Pandora Goode

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To my husband, John, my daughter, Arley, and my son, Larry.  
Thank you for your love, support, and continual encouragement.

APPROVAL PAGE

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## **CHAPTER I**

### **INTRODUCTION**

Diabetes is one of the fastest growing epidemics in the United States and African American adults are two times more likely than their white counterparts to be diagnosed with type 2 diabetes (Center for Disease Control and Prevention [CDC], 2014). Diabetes is different from many other diseases, where medication alone may be all that is required to manage the illness. Type 2 Diabetes (T2D) may be controlled through lifestyle modifications such as weight loss, diet, and exercise, but eventually, most individuals will need oral hypoglycemic agents and/or insulin to manage their disease. Individuals diagnosed with diabetes must perform self-care practices in order to effectively manage their illness. Because diabetes self-care practices are performed by patients, families, and significant others, there is an important need for diabetes self-management knowledge. Those who live successfully with diabetes maintain control over their blood sugar by eating a healthy diet and engaging in regular exercise. Diabetes self-management education (DSME) is essential for successfully living with diabetes.

#### *Background*

In the United States, 21 million Americans have been diagnosed with diabetes and an estimated 8.1 million remain undiagnosed (CDC, 2014). One projection is that the number of persons living with diabetes will increase by 64% between 2010 and 2025 to 53.1 million (Rowey, & Bezold, 2012). Diabetes affects people in all cultures, but the

prevalence is predominately higher among African Americans, Hispanics, American Indians, and Alaskan Natives. The Center for Disease Control and Prevention [CDC] (2014) noted that African Americans account for 13.2% of those affected by this chronic illness, making diabetes a serious concern in the African American community (CDC, 2014). Obesity, hypertension, and poor dietary habits in addition to environment, education, and cultural factors are reasons why African Americans are more at risk for developing diabetes (Healthy People 2020, 2011). Many African Americans nutritional practices were inherited from their cultural influences and they still exist today. These influences contribute to higher rates of obesity (49%) and being overweight (27%) among African Americans, which increases the risk of developing type 2 diabetes (T2D) (Flegal, Carroll, Kit, & Odgen, 2012).

The incidence of newly diagnosed diabetes increased over the past decade, from 493,000 cases in 1980 to 1.5 million in 2011 (CDC, 2011). In 2010, diabetes was the cause of death on 234,051 death certificates (CDC, 2014). According to the National Vital Statistics report in 2010, the age-adjusted death rate for African Americans with diabetes was twice that for the white population; the average risk of death for African Americans with diabetes is 2.8% higher than for the white population (Murphy, Jiaquan, & Kochanek, 2013). See table 1.

**Table 1. Age-Adjusted Diabetes Death Rates per 100,000 (2010)**

Gender	Non-Hispanic Black	Non-Hispanic White	Non-Hispanic Black/Non-Hispanic White Ratio
Male	44.6	22.3	2.0
Female	35.9	14.9	2.4
Total	39.6	18.2	2.2

Source: CDC, 2013. National Vital Statistic Report. Vol. 61, Num 4 Table 17.

The prevalence of diabetes in African Americans is nearly double that of whites at 13.2% and 7.6%, respectively (CDC, 2014). Persons with diabetes are predisposed to complications causing grave consequences such as hospitalization, disability, and death. One common sign of diabetes, elevated blood sugar over time, may present as complications that include nerve damage, visual problems, and kidney disease. According to the CDC (2011) diabetes is the leading cause of blindness, kidney failure, and non-traumatic lower limb amputations. African Americans with diabetes have a five times higher rate of leg amputations compared to whites (Peek et al., 2012). African Americans with diabetes have a greater risk of stroke and a greater mortality rate from heart disease. Blood sugar values within a specific range, along with proper dieting, and physical activity can prevent or slow the progression of diabetes complications (CDC, 2011). To improve blood sugar control, diabetes self-management education (DSME) programs target lifestyle and behavior modifications. These programs have the potential to help those with diabetes avoid complications associated with the disease and eliminate the disparity associated with this disease.



According to the American Diabetes Association (ADA), Diabetes Self-Management Education (DSME) is the process of obtaining knowledge, skill, and capability necessary for diabetes self-care (ADA, 2011). This process includes skill development necessary for decision making, goal setting, and managing the stresses of living with diabetes and is guided by evidence-based standards (Haas et al., 2012). Guiding Principles (Table 2) and the National Standards for DSME which focuses on: (1) the educational needs of the target population(s) affected by the disease, (2) instructional delivery by professionals experienced in diabetes self-management, (3) written curricula reflecting evidence-based guidelines, and (4) methods for evaluation effectiveness were developed as guidelines to assist health professionals in providing quality and evidence-based diabetes self-management education (Funnell et al., 2010).

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**Table 2. Guiding Principles for DSME**

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1. Diabetes education is effective for improving clinical outcomes and quality of life, at least in the short-term.
2. DSME has evolved from primarily didactic presentations to more theoretically based empowerment models.
3. There is no one “best” education program or approach; however, programs incorporating behavioral and psycho-social strategies demonstrate improved outcomes. Additional studies show that culturally and age-appropriate programs improve outcomes and that group education is effective.
4. Ongoing support is critical to sustain progress made by participants during the DSME program.
5. Behavioral goal-setting is an effective strategy to support self-management behaviors. (Funnell et al., 2010, p. S.89)

Therefore, the purpose of this study was to test a 6-week faith-based diabetes self-management program for African American adults diagnosed with diabetes. The aim of the intervention was to increase knowledge about diabetes and diabetes self-management practices, improve lifestyle behaviors, and increase knowledge about symptom management to prevent and treat hypoglycemia for African Americans living in the southeastern United States. By reaching these goals, this project contributes to Healthy People 2020 objective D-14, which is to increase the proportion of persons with diabetes who received diabetes self-management education (Healthy People 2020, 2011). Further, the study has the potential to help ameliorate the disparity in diabetes experienced by African Americans in this study.

#### *Significance of the Problem*

Diabetes continues to be a public health burden on the economy in the form of increased medical costs and indirect costs from work-related absenteeism, inability to work due to chronic disability, and premature mortality (CDC, 2011). Treatment of diabetes and diabetes related complications is costly. The American Diabetes Association [ADA] (2013), noted that direct and indirect expenditures due to diabetes are estimated at \$245 billion dollars annually, including \$176 billion in direct medical cost and \$69 billion in reduced productivity. Diabetes affects the elderly population more than any other age group. Thus, a disproportionately high proportion of Medicaid and Medicare dollars are spent on diabetes. According to the CDC, 10.9 million Americans aged 65 years or older had diabetes in 2010 (2011).

The cost for diabetes care in the U.S. is largely supported by government insurance (Medicare and Medicaid). Persons with diabetes with no health insurance have 55% more emergency department visits than persons who have insurance (ADA, 2013). Reasons for the disparity in diabetes for African Americans includes that African Americans seldom have a consistent primary care provider and they are less likely to be offered preventive services (Agency for Healthcare Research and Quality [AHRQ] 2012). African Americans are less likely to seek preventive care or screening tests and are more likely to rely on the emergency department for routine health care. Thus African Americans use the emergency department more frequently than any other race. African Americans are more likely to suffer from diabetes related complications than their white counterparts. Another way that diabetes is a public health and financial burden is that it is the primary reason many African Americans experience end stage renal disease (CDC, 2011). Also, African Americans are more often diagnosed with this chronic and potentially fatal condition than other races (CDC, 2011).

Primary care clinics are where most patients are diagnosed and treated for diabetes. Activities that occur in primary care settings are critical because this starts the course of treatment for the patient's disease and has implications for the eventual outcome. Teaching diabetes self-management skills and knowledge about the illness can be challenging in the primary care setting, especially when health care providers are limited for time spent with patients. Consequently, many patients diagnosed with diabetes are not receiving diabetes self-management education at a time when they are seeking information about the disease. Self-management education is needed because

many patients lack self-management knowledge. Healthy People 2020 guidelines noted in 2009 of African Americans with diabetes, 62.1% have never taken a course on diabetes self-management (Healthy People 2020, 2011). Given the burden that this group faces with regard to diabetes and its negative outcomes, African Americans are in need of diabetes self-management education.

Studies indicate that diabetes knowledge and self-care behavior can produce successful outcomes. Duncan et al. (2009) conducted a study to examine the effectiveness of diabetes self-management education by diabetes educator in reducing diabetes related complications and an improved overall health. The findings indicated that persons who participated in diabetes self-management education had lower health cost patterns compared to people with diabetes that did not receive diabetes self-management education (Duncan et al., 2009). Diabetes self-management knowledge and lifestyle modifications have been directly associated with improved blood sugar control, fewer hospitalizations, and lower diabetes related medical costs (CDC, 2011). Diabetes self-management education has been shown to be associated with lower blood sugar averages, and fewer acute emergency complications such as hypoglycemia (low blood sugar) and hyperglycemia (high blood sugar). Other benefits of self-management education include reduced health care utilization and health care costs, and an overall improved health for those suffering from diabetes. Knowledge alone does not guarantee behavior change; however, knowledge is considered a necessary component to improving self-efficacy and for changing behavior (D'Eramo-Melkus et al., 2004).

### *Statement of the Problem*

Diabetes is the fifth leading cause of death for African Americans. According to the CDC, approximately 1 in every 5 African Americans has diabetes (2014). Efforts to reduce this disparity are critical. Preventive care measures and diabetes self-management education requires health care access and quality healthcare. Chronic diseases are the most prevalent health problems affecting the United States today and African Americans have the highest rate for all chronic diseases (CDC, 2011). African Americans with diabetes are poorer, more often unemployed, and uninsured, and less likely to attend formal diabetes self-management classes (Gaskin et al., 2014). African Americans of low socioeconomic status may experience additional stressors such as financial burdens, limited healthcare access, less education, and the absence of culturally relevant diabetes education. These stressors limit African Americans understanding of the disease and inhibit the ability to make healthy lifestyle choices to manage the disease (Steinhardt et al., 2015).

An understanding of African Americans characteristics including culture and spirituality, and the influences these have on diabetes self-management behaviors is an important step in designing accurate, relevant, and effective DSME programs. The African American culture consists of many African ethnicities and languages. African American families can be better understood in the context of their history in the United States. African Americans were forced to leave their heritage of Africa and relocate to America for the purpose of enslavement. The characteristics and lifestyles among African Americans are based on traditional values and religious background, which

included poor nutrition and lack of physical activity that still exist (Airhihenbuwa, 1996). The CDC (2011) noted that African Americans were 50% less likely to engage in some physical activity when compared to non-Hispanic whites, and further noted that 49% of African Americans were physically inactive compared to 39% of whites (CDC, 2011).

Because spirituality is embedded within the culture of African Americans, a program which includes a faith-based institution and faith-based messages has the potential to have a compelling influence on diabetes beliefs and health care behaviors. An important connection for many African Americans is the local church, which is an organization that has major influences on individuals' and on community life. Pastors are typically the gatekeepers for access to their members and are essential in developing a trusting and working relationship among members and with communities at-large. Key stakeholders (Pastors, Clergy Persons, Parish Nurses, and members) can assist in tailoring interventions to adapt programs to community characteristics, because of their intimate relationship with community members. (Austin, & Clairborne, 2011; Gutierrez et al., 2014; Johnson et al., 2014; Samuel-Hodge et al., 2009).

Initiating diabetes self-management education in faith-based settings can motivate members to adopt healthier habits. Integrating spiritual principles with practical principles may be a strategy to assist persons to understand how to make positive health decisions. Faith-based programs can allow individuals to acquire the diabetes knowledge necessary to manage their disease and practice the necessary lifestyle changes within the context of their culture and community. In addition, individuals may acquire the skills

necessary to treat signs and symptoms of hypoglycemia which may result in a decreased utilization of emergency room visits, hence cost savings.

Diabetes is a progressive disorder accompanied by acute and chronic symptoms throughout the disease process. Persons with uncontrolled diabetes experience symptoms, particularly the classic symptoms of excessive thirst, excessive hunger, and excessive urination. Other common symptoms include blurred vision, low blood sugar (glucose), and numbness and tingling in the lower extremities (ADA, 2013). African Americans experiencing diabetes symptoms oftentimes do not recognize the symptoms as part of the disease. This disconnection is mostly likely due to the lack of understanding and knowledge about the disease. In a prior study, African American women with diabetes did not recognize the relationship between their symptoms and diabetes (Skelly et al., 2008). Helping persons with diabetes understand diabetes related symptoms and symptoms management may produce positive outcomes and reduce acute diabetes complications. Thus, the success of diabetes self-management programs must address issues which may prohibit African Americans' participation in diabetes self-management programs including low literacy, access to care, and socioeconomic status (McCleary-Jones, 2011; Ricci-Cabello et al., 2013; & Steinhardt, et al. 2015).

Several diabetes self-management education (DSME) programs are community driven and target lifestyle and behavior modifications with effectiveness reported in African Americans (Collins-McNeil et al., 2012; Gutierrez et al., 2014; Samuel-Hodge et al., 2009). Considering the number of African Americans suffering with diabetes, it is quite evident that traditional methods such as providing pamphlets or videos on diabetes

have been unsuccessful when implemented as the only strategy. Recognizing the community as a means for delivering self-management education to underserved populations has the potential to have an impact on diabetes disparities.

### *Assumptions*

One major assumption in this study was that participation in diabetes self-management education would increase diabetes knowledge, and allow participants to recognize and manage signs and symptoms of hypoglycemia. Another assumption is that diabetes self-management education would improve self-efficacy and self-care behaviors.

### *Research Aims and Hypotheses*

The purpose of this pilot study was to test a 6-week faith-based intervention program to improve diabetes self-management. The program included content on physical activity, diet, medications, glucose monitoring and foot checks in African Americans with type 2 diabetes. The following hypotheses were tested.

After receiving a 6-week faith-based intervention, participants will show significant improvement from pre to post intervention in:

Hypothesis 1. Diabetes knowledge, self-efficacy, and diabetes symptoms management.

Hypothesis 2. The outcome of diabetes self-management (physical activity, diet, glucose monitoring, medication, and daily self-foot checks).

### *Conceptual Definitions*

1. *Behavior* – how confident a person feels about their ability to perform a given task (Bandura, 1977). Behavior was defined in this study as diabetes self-management.



2. *Diabetes Self-Management*- According to the American Diabetes Association (ADA), DSME is the process of obtaining knowledge, skill, and capability necessary for diabetes self-care (ADA, 2011). Diabetes self-management was defined in this study as increased physical activity, diet, daily foot checks, and glucose monitoring and medication adherence.

3. *Diabetes Knowledge*- was defined in this study as knowing the diagnosis, symptoms, and management of diabetes.

4. *Self-Efficacy* - individual beliefs and capability of carrying out a given task (Bandura, 1977). Self-efficacy was defined in this study as the confidence in performing a recommended task.

5. *Symptom Management*- as improving an individual's health by decreasing unwarranted symptoms and improving overall quality of life (Dodd et al. 2001). For this study symptoms management was defined as recognizing and managing symptoms of hypoglycaemia.

#### *Knowledge Gaps and the Relationship with Diabetes Self-Care Management*

The review of literature confirmed that traditional delivery of diabetes self-management education is challenging. Based on the documented disparities in complications and health outcomes among African Americans when compared with other groups, there is sufficient evidence to question whether traditional methods for diabetes self-management are appropriate for African Americans. From 2009 through 2014 there have been a total of 13 research studies that focused on diabetes self-management among African Americans in community-based settings. Currently 13.2% of African Americans

have diabetes and if this current trend continues, by 2025 one in every third African American may be living with diabetes (CDC, 2014). Thus, studies delivering community-based diabetes interventions is needed to accommodate the large population of African Americans experiencing diabetes. The goal of diabetes self-management education is to improve and reduce the diabetes disparity that currently exists with this population.

Researchers and collaborative communities have implemented culturally relevant diabetes self-management programs in communities. These DSME programs emphasized and focused on diabetes knowledge, self-management skills, problem solving skills, diabetes complications, physiological (A1Cs, blood pressure and lipid profile) and psychosocial measures, and quality of life indicators (Bielaowicz, Pope, & Rice, 2012; Lynch et al., 2014; Peek et al., 2012; Tang, Funnell, & Oh, 2012; Tucker et al., 2014; Walker, Stevens, & Persaud, 2010).

The use of community health representatives (CHRs) has proven to be effective in reducing health disparities in underserved communities (Cherrington et al., 2008). CHRs have an intimate understanding of their community's cultural background, experiences, and strengths. CHRs in effective interventions completed training by expert professionals and provided DMSE that included content on: (a) healthy eating, (b) preventing low blood glucose, (c) physical activities, (d) diabetes related complications, (e) problem solving, and (f) glucose monitoring (Ghorob et al., 2011; Lorig, Ritter, Villa, & Armas, 2009; Spencer et al., 2011; Steinhardt et al., 2009; Tang, Funnell, Gillard, Nwankwo, & Heisler, 2011). Therefore, in the completed study, a trained lay worker was

used for enrollment and data collection because of her knowledge of and intimacy with the community. Spirituality plays an important role in the lives of many African Americans. Within these studies, designed to test interventions to improve health knowledge and outcomes among African Americans the spiritual, psychosocial, and cultural practices of African Americans were integrated into DSME. The curriculum focused on healthy eating, being active, glucose monitoring, and medication adherence. The participants were allowed an opportunity to interact directly with the clergy or the trained spiritual counselors regarding their emotions, beliefs, and perceptions about diabetes self-care practices and individual problem solving. Sessions included: prayer, scripture reading, praise and worship, and meditation (Samuel-Hodge et al., 2009; Austin, & Claiborne, 2011; Collins-McNeil et al., 2012; Johnson et al., 2014; Tang, Nwankwo, Whiten, & Oney, 2012; Gutierrez et al., 2014). These studies demonstrated the need for and importance of integrating DSME into spiritual practices, thus addressing the whole needs of individuals. Designing holistic faith-based diabetes self-management programs may have positive effects on diabetes self-care practices and improve overall health.

Based on the review of the literature, it is reasonable to view diabetes self-management education delivered in community-based settings effective in improving diabetes outcome indicators. There were a number of variables evaluated within the studies reviewed. First, diabetes knowledge was an outcome indicator examined in several diabetes self-management studies: (Gutierrez et al., 2014; Samuel-Hodge et al., 2009; Walker, Steven, & Persaud, 2010; Williams et al., 2014). Across the studies the findings indicated significant improvements in diabetes knowledge. Secondly, lifestyle

modifications were noted as an outcome indicator within many of the studies: (Collins-McNeil et al., 2012; Gutierrez et al., 2014; Lynch et al., 2014, Steinhardt et al., 2009) with significant improvements documented throughout the studies. Lastly, few studies in diabetes self-management included symptom management as an outcome measure for African Americans (Lorig, Ritter, Villa, & Armas 2009; Spencer et al., 2011; Williams et al., 2014).

African Americans have higher rates of diabetes complications than any other race, thus more research is needed to evaluate the variable self-efficacy and the relationship with diabetes self-management practices in this population. Also, the effects on symptom management were limited indicating the need for more studies to establish knowledge in this area. Finally, more studies are needed to examine the effectiveness of faith-based interventions for this disadvantaged group of people.

This study proposed that providing culturally tailored faith-based diabetes self-management education to adult African Americans with type 2 diabetes, within the Social Cognitive Theory Framework would improve diabetes knowledge, self-efficacy, diabetes symptoms management, and diabetes self-management outcomes. The uniqueness of this study is that it included 6-weekly one hour educational sessions and participants were encouraged to practice self-care behaviors independently and concurrently within the 6-week sessions. Also, participants were given weekly homework assignments to complete and return for discussion. Those activities were strategically planned to produce positive outcomes.

This study is different than previous studies because one hour sessions were used rather than two hour sessions used in previous studies. This required less time off from work and family, and avoided information overload. Participants were given several homework assignments that were intentional to improve diabetes knowledge, self-efficacy, symptom management, and diabetes self-care activities. A 6-week intervention was selected rather than the traditional 8 to 12 week sessions to be more realistic and accessible for the participants. In addition, faith-based activities and materials were included and cultural tailoring for the African American community was developed by the investigator. The investigator immersed herself into the community.

### *Summary*

This chapter outlines the significant problems associated with diabetes in African American adults and how they contribute to increased morbidity and mortality due to poorly controlled glucose levels in this population. The prevalence and incidence of diabetes is higher in African Americans compared to whites. Because of diabetes, African Americans are more at risk for other chronic diseases including: hypertension, stroke, hyperlipidemia, and end stage renal disease. In addition, diabetes places African Americans at higher risk of blindness and amputation compared to any other race.

Diabetes continues to be a public health burden. Diabetes is expensive in terms of disability, mortality, and health care costs (CDC, 2011). Diabetes self-management education and lifestyle modifications have been directly associated with improved glycemic control, lower health care utilization, and lower diabetes related medical costs (CDC, 2011).

In order to address diabetes self-management among African Americans, there is need to recognize the factors that contribute to healthcare access in this population. There should be improved collaboration between community members, researchers, and policy makers to reform the disconnected approach that currently exists in type 2 diabetes management. By recognizing the community as an excellent conduit through which diabetes education, health promotion, and preventive health care interventions can occur, these efforts can help to reduce diabetes inequities nationally and globally.

## **CHAPTER II**

### **REVIEW OF THE LITERATURE**

#### *Introduction*

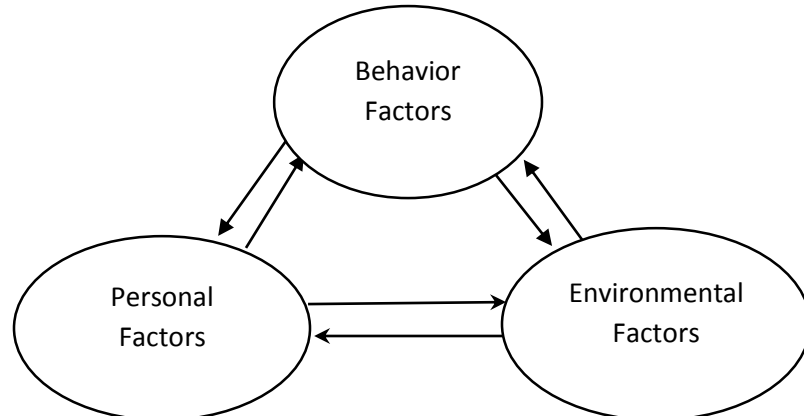
Diabetes self-management education is critical for all persons with diabetes and is needed to yield improvements in outcomes associated with the disease. Research evidence has indicated that diabetes self-management programs are effective particularly for a limited duration, thus reevaluation and continuing self-management support is needed to sustain self-management behaviors. (Funnell et al., 2010). This review of literature examined DSME and self-care programs and their effectiveness and related factors.

Using theory as a guiding framework for community-based diabetes interventions in African American residents provides the principles and guidance needed to generate nursing knowledge. However, choosing an appropriate theoretical framework to guide community-based diabetes interventions can be challenging. For this study three theoretical frameworks directed at behavior change were considered. The three frameworks include the: 1). Health Belief Model, (Rosenstock, 1974); 2). Theory of Planned Behavior (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975); and 3). Social Cognitive Theory (Albert Bandura's 1977, 1986). All were evaluated with respect to historical and theoretical perspectives to determine the best fit to guide the intervention.

Selecting the most appropriate theory is important, because lack of clarity makes it hard for readers to understand how the knowledge generated is to be applied.

Because the success of diabetes self-management is measured by considering the person's physiological and psychosocial abilities to carry out self-care activities, the SCT was selected to guide this diabetes self-management study. Within the SCT, the model considers several factors that may directly and indirectly influence a person's self-efficacy. The SCT (Figure 1.) provided the context for understanding the cognitive, affective, and psychomotor domains and how they influence diabetes self-management behaviors among African Americans.

Figure 1. Bandura's (1986) Triadic Reciprocal Determination



### *Social Cognitive Theory*

Albert Bandura established his concept of self-efficacy in the late 1970's. Self-Efficacy is a well-known theory by itself and in 1977 Bandura added self-efficacy as a construct to his Social Cognitive Theory (Bandura, 1977). Social Cognitive Theory (SCT) originated in the discipline of psychology and focuses on human behaviours. The



initial study (Bandura, 1977) that led to the development of the self-efficacy theory included participants with ophidiophobia randomly assigned to three different treatments: (1) enactive attainment, actually touching the snakes; (2) seeing others touch the snakes; and (3) the control group. The findings suggested that self-efficacy was a predictor of behaviour and the greater the degree of enactive attainment the stronger the self-efficacy expectations (Bandura, 1977). The theory posits that behavior can be explained by how confident a person feels about their ability to perform a given task.

Bandura's Self- Efficacy Theory conceptualizes the person-behavior-environment interactions as bidirectional influences among the three constructs. Self-efficacy and outcome expectations involve opinions about an individual's capability to perform a given assignment. Beliefs in an individual's capability are key components of self-efficacy and outcome expectations; if individuals do not believe they are capable of carrying out a specific task, they are less likely to complete it (Bandura, 1977).

People are capable of altering their thought processes by rejecting or accepting truth. According to Bandura (1997) this process is called self-regulation. Subjective beliefs produces motivation and capability to perform tasks (Bandura, 1997). There are two main components of self-efficacy theory, self-efficacy expectations and outcome expectations.

#### *Self-Efficacy Expectations*

Self-efficacy expectations are when information is evaluated carefully to determine if individuals have the capability to carry out activities. A key aspect of the Social Cognitive Theory is that humans have the ability to examine their mental and

emotional thoughts and decide how to process the information. They may accept the information as truth or modify the information based on their beliefs. It is the examining of the information that determines the level of self-efficacy. The processing of information includes meditating on ones' beliefs. It is the beliefs that influences a person's confidence and response to a given task. The stronger the belief the greater the self-efficacy for performing the task. If a person feels uncertain about performing a task he or she will most likely not perform the task. The greater the confidence level the greater the self-efficacy (Bandura, 1977).

#### *Outcome Expectations*

Outcome expectations are the successful completion of the recommended behavior. People's perceptions are based on their level of confidence in performing recommended actions and are determined by four factors: (1) mastery experiences, (2) vicarious experiences, (3) social persuasion, and (4) physiological and emotional states (Bandura, 1995).

Mastery experiences are the most influential determinant of self-efficacy. When individuals successfully perform repeated recommended actions it strengthens their self-efficacy beliefs. Conversely, repeated failures weakens one's self-efficacy. Mastery experiences involves obtaining the cognitive, behavioral, and self-regulatory skills for performing recommended behavioral actions (Bandura, 1995).

When a person observes others similar to her or himself perform the same recommended activity, it will influence the person's beliefs that they, too, have the

capability to perform the activities. Thus, observing others fail at performing the same activities lowers a person's beliefs about their own efficacy (Bandura, 1995).

People who are persuaded verbally that they have the capabilities to master recommended activities are more likely to use intense effort than if they are doubtful about personal inadequacies. Social persuasion influences a person's self-efficacy and leads one to push toward success (Bandura, 1995).

Individuals evaluate information from their physiological and emotional state to judge their capabilities in behavioral performances. Emotions affect a person's perception of his/her self-efficacy, greater emotions may enhance self-efficacy and lesser emotions may diminish self-efficacy (Bandura, 1995).

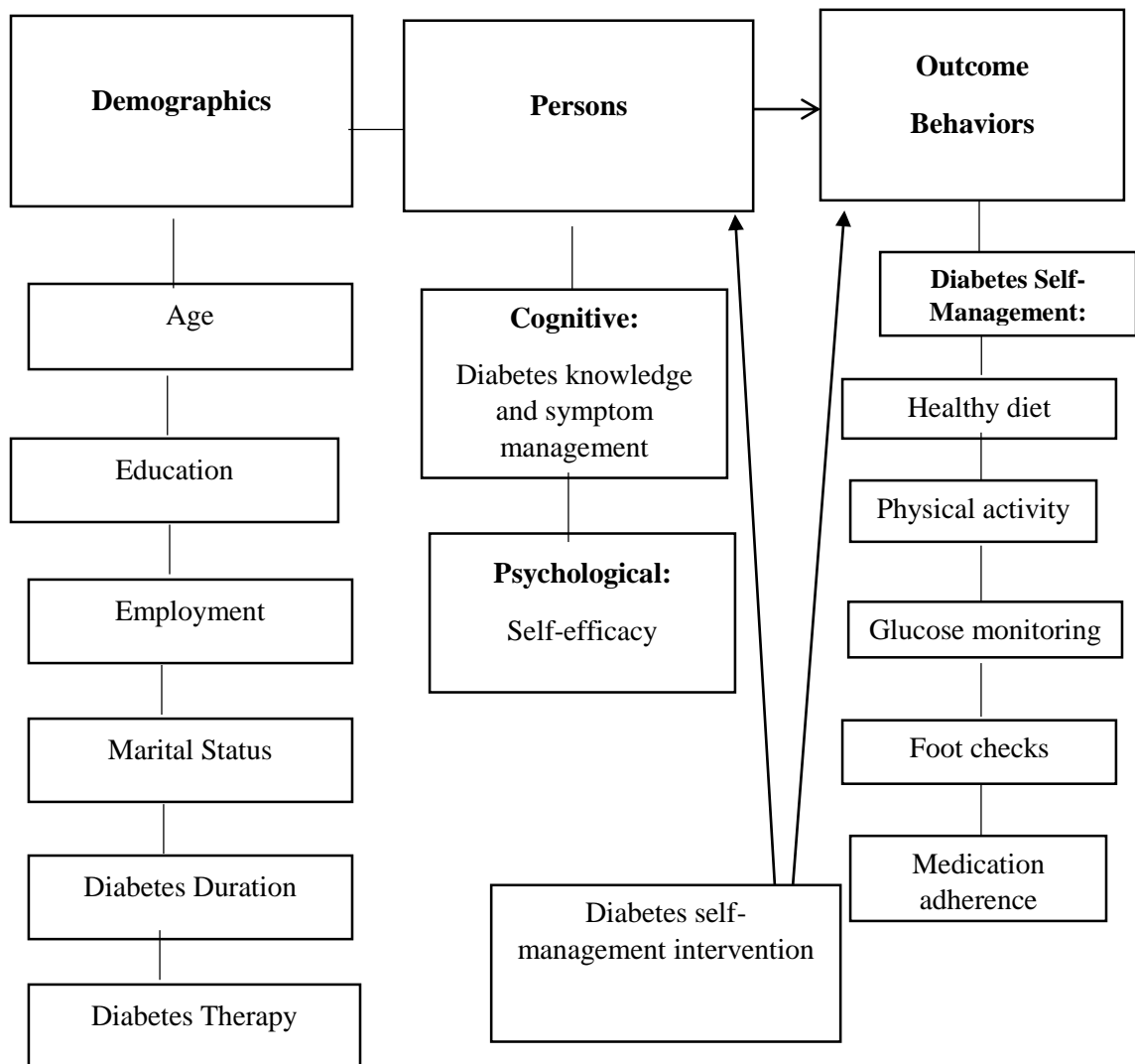
Four main variables: (1) diabetes knowledge, (2) self-efficacy, (3) symptom management, and (4) diabetes self-management were selected to be measured in this study. Bandura's self-efficacy theory guided the diabetes self-management intervention. Bandura's self-efficacy theory conceptualizes the person-behavior-environment interactions as bidirectional influences among the three constructs. Self-efficacy and outcome expectations involve opinions about an individual's capability to perform a given assignment. Beliefs in an individual's capability are key components of self-efficacy and outcome expectations; if individuals do not believe they are capable of carrying out a specific task, they are less likely to complete it (Bandura, 1977).

This intervention study was guided by the Social Cognitive Theory as a conceptual framework with focus on person (diabetes knowledge, self-efficacy, symptom management) and behavior (diabetes self-management) at a church setting (as the

environment component of the model). Within this study, the diabetes self-management program is conceptualized as the foundation that supports the development of improved diabetes knowledge, self-efficacy, symptoms management, and outcome behaviors.

Figure 2 depicts the conceptual framework for this study.

Figure 2. Conceptual Framework for Diabetes Self-Management



### *Review of the Literature*

Community-based interventions have been documented in the literature as being successful and can have compelling influences on beliefs and health care behaviors (Sherifali, Greb, Amirthavasar, Gerstein, & Gerstein, 2011). This literature review was conducted to examine Diabetes Self-Management Education (DSME) interventions relevant to African Americans in community-based settings. A review of the literature was conducted using the online databases CINAHL, PubMed, Web of Science, Scopus, and PsycInfo. Inclusion criteria were English-language articles published between 2005 thru 2014 that reported on DSME in community based settings. Key terms entered into the search engines (“faith-based,” “community-based,” “self-care,” “self-management,” “African American,” “diabetes education,” and “diabetes,”) in various combinations. Key concepts related to the model guiding this study (SCT) were also examined. The literature search yielded a total of 13 research studies for diabetes self-management education in faith-based and community-based settings from 2009 thru 2014.

### *Diabetes Knowledge*

Diabetes knowledge affects diabetes self-management, and clearly, literacy affects knowledge development. Montague, Okoli, and Gerrier-Adams (2003) conducted a literacy study of eighty-one African Americans with diabetes, and found that 33% of participants had minimal to poor functional literacy (Montague et al., 2003). Poorly managed diabetes among African Americans has been associated with low levels of diabetes literacy resulting from low levels of literacy in general, low socioeconomic status, and lack of access to diabetes information (Jackson, et al., 2006). A systematic

literature review from 1980 to 2003 found that low literacy was associated with poor medication adherence, increased hospitalization, and decreased glycemic control with increased reports of microvascular and macrovascular diseases among African Americans (McCleary-Jones, 2011).

McCleary-Jones (2011) conducted a descriptive study evaluating health literacy and its relationship with diabetes knowledge, self-efficacy and diabetes self-management among African Americans. The author used Bandura's Social Cognitive Theory to guide this study. A convenience sample of 50 African Americans participated in this study. Health literacy was evaluated by using the Rapid Estimate of Adult Literacy in Medicine (REALM) questionnaire. The Diabetes Knowledge Test (DKT) was used to evaluate diabetes knowledge. The Summary of Diabetes Self-care Activities questionnaire (SDSCA) was used to assess diabetes self-management behaviors. The Diabetes Self-efficacy Scale evaluated the level of confidence a person had in performing self-care activities. The author hypothesized that a correlation existed between scores on the REALM and DKT with the score on the SDSCA among African Americans with diabetes. The findings revealed statistically significant findings between health literacy and diabetes knowledge. Diabetes knowledge was positively associated with dietary self-care activities (McCleary-Jones, 2011).

Walker, Steven, and Persaud (2010) sought out to increase knowledge and self-management of diabetes among African American with type 2 diabetes. This intervention consisted of 3 two-hour interactive sessions regarding diabetes knowledge, diabetes complications, and diabetes self-management. Diabetes knowledge was

evaluated using the Diabetes Knowledge Test (DKT) scale. Outcome indicators for this study included baseline: (1) physiological measures, (2) self-report of exercise activities, (4) diet recall, (5) diabetes adherence, and (6) blood glucose levels. The study results revealed a statistically significant improvement in diabetes knowledge. There were no improvements in hemoglobin A1C (HbA1C), body mass index (BMI), and weight. (Walker et al., 2010). This may have been related to the interventions. Both prior studies samples consisted African Americans. The interventions provided by each study were not culturally tailored to meet the needs for the sample population. Walker et al. (2010) used nursing students to help implement their study, who most likely were not part of the community and could not provide peer support for community members.

Although participants in this study had no initial improvements in the physiological outcome indicators after the intervention, the improvement in diabetes knowledge may eventually lead to improvements in HbA1C, and weight reduction. Acquiring diabetes knowledge has the potential to improve diabetes self-care behaviors.

Lastly, Williams et al. (2014) conducted a randomized controlled trial evaluating a culturally tailored community-based group DSME among African Americans. A total of 25 participants completed the study. The outcome indicators included: (1) demographic variables, (2) self-management questions, (3) diabetes knowledge, (4) self-efficacy, (5) problem-solving skills, (6) A1Cs, (7) weight, height, and BMI, and (8) general physical and mental health status. The Spoken Knowledge in Low Literacy Diabetes (SKILLD) scale was used to evaluate diabetes knowledge. The Medical Outcome Study (SF-12) scale assessed physical and mental status, and confidence in diabetes management was

assessed by the Diabetes Empowerment Scale-Short Form (DES-SF). The study findings indicated a decrease in A1Cs levels but this finding was not statistically significantly different. In addition, there were statistically significant diabetes knowledge and foot care findings (Williams et al., 2014). All four studies gave insight into the importance and the need for diabetes education. Also, these studies validated the need for designing relevant and effective educational materials to help individuals with low literacy levels.

### *Symptoms Management*

People with diabetes oftentimes experience symptoms throughout the course of the disease and lack understanding as to why these symptoms occur. Bhattacharya (2012) conducted a qualitative study examining the factors influencing diabetes self-management among African American adults. When the participants were asked about symptoms experienced after being diagnosed with diabetes, the participants were unable to relate the symptoms to diabetes, instead they contributed the symptoms to old age. In addition, the participants interpreted nutrition and physical activity guidelines as impractical and culturally irrelevant and medication non-adherence was found to be due to inadequate knowledge of diabetes as a chronic disease (Bhattacharya, 2012).

Diabetes self-management education has the potential to provide participants with the necessary information to acquire the knowledge to recognize signs and symptoms associated with their illness and about treatments for acute complications. Lorig, Ritter, Villa, and Armas (2009), examined a community-based, peer-led intervention. Evaluation measures included: (1) health status, (2) lifestyle behaviors, (3) health care utilization, (4) self-efficacy, (5) A1C, (6) depression, (7) symptom management, and (8)



diabetes knowledge. Self-efficacy was assessed using the diabetes self-efficacy scale. Health care utilization was measured by self-report, depression was evaluated with the Health Distress scale, and the Patient Activation Measure (PAM) scale was used to assess diabetes knowledge. Lifestyle behaviors were assessed. The findings revealed statistically significant improvements in depression, symptom management and healthy eating (Lorig et al., 2009). Diabetes self-management helps participants recognize and treat signs and symptoms of acute complications such as hypoglycemia which in turn may decrease unnecessary use of the health care system.

### *Diabetes Self-Management*

According to the American Diabetes Association (ADA), DSME is the continuing process of providing knowledge, acquiring the skills, and having the capability for diabetes self-care (ADA, 2011). This process incorporates skills necessary to make informed decisions, goal setting, and managing the demands of living with diabetes and is guided by evidence-based standards (Haas et al., 2012). However, for most African Americans with diabetes, making healthy choices poses challenges, because friends and families are often insensitive to the needs of the person who has diabetes. For example, women are usually responsible for shopping and cooking for the family and may purchase foods preferred by other family members, thus making their food choices at home more difficult. In the work place friends or colleagues are not necessarily mindful of the person who has diabetes. Eating healthy can be expensive, especially when you live in communities where grocery stores are out of reach and fast food stores are in reach. Thus, for many African Americans, cost and transportation can be a major barrier

to healthy living. Barriers to DSME were reported by Chlebowy, Hood, and LaJoie (2013) in the study exploring gender differences in diabetes self-management among African American adults. The findings indicated that for men barriers to diabetes self-management were: lack of family support, lack of time, and lack of knowledge. For women, barriers to self-management were lack of finances, embarrassment, negative outlook, and perceived lack of disease control (Chlebowy, Hood, & LeJoie, 2013).

Johnson and Nies (2005) conducted a qualitative study to explore barriers to health promoting behaviors of African Americans. The sample consisted of twenty-one African American adult participants, twelve resided in rural areas and nine resided in metropolitan areas. Focus group interviews were used to collect data and three themes emerged from the data: cost, not having enough time, and lack of motivation. In the first theme both groups identified cost as a barrier, however, the metropolitan group felt that cost was a factor but not an obstacle for being healthy. The rural group felt cost was a primary barrier for eating and living healthy. For example, one respondent indicated that eating healthy is expensive, although the desire to eat healthy exists, the funds are limited. Fast foods are easily accessible and less expensive and healthy foods are expensive and inaccessible (Johnson & Nies, 2005). Another theme identified was lack of time; both groups agreed that scheduling was a major issue. Health promoting behaviors interfered with work, family, and home obligations. Many participants felt that there were not enough hours in the day to participate in health promoting activities. Lack of motivation was the third theme. Both groups lacked motivation for various reasons such as long work hours, fatigue, home priorities, money, transportation, unsafe

neighborhoods, and other personal reasons (Johnson & Nies, 2005). It is apparent that African Americans face many challenges and barriers such as transportation issues and access to healthy nutrition that may prohibit them from practicing adequate self-care activities, therefore, community based diabetes interventions are deemed appropriate to address the unique needs of this community.

Steinhardt, Mamerow, Brown, and Jolly (2009), examined the effects of a Diabetes Coaching Program (DCP) on resilience and diabetes self-management. A convenience sample of 16 African Americans with type 2 diabetes participated in the study. The authors used a pre-experimental, 1-group pretest-posttest design to test the feasibility of the DCP. Outcome indicators examined included the following: (1) resilience, (2) coping strategies, (3) diabetes empowerment, (4) depression symptoms, (5) diabetes self-management, (6) and physiological measures (BMI, glucose, HbA1C, lipids, and BP). The results revealed statistically significant improvements in diabetes self-management and empowerment, weight reduction, total cholesterol, and blood pressure (Steinhardt et al., 2009). These results revealed the importance of health coaching and the impact it can have on diabetes self-care behaviors. It also demonstrated the need for health care professionals to serve more in the coach role. Sometimes individuals need to be coached into adopting healthier lifestyle behaviors. Coaching may be an important part of an intervention designed to help African Americans successfully manage their diabetes.

Lynch, Liebman, Ventrelle, Avery, and Richardson (2014), examined a community-based group intervention on self-management behaviors and peer support for weight reduction among African Americans diagnosed with diabetes and hypertension.

A total of sixty-one participants were randomized into two groups: (1) the Lifestyle Improvement through Food and Exercise (LIFE) intervention, or (2) the control group. The classes were facilitated by a registered dietitian and two African American peer supporters. The outcomes measured for the study included: (a) height and weight, (b) nutrition patterns (c) physical activity and (d) quality of life. The Summary of Diabetes Self-Care Activities (SDSCA) scale was used to assess diabetes self-care practices. Treatment success was defined as 5% weight reduction and 0.5% reduction in hemoglobin A1C at 6 months' post intervention. The results of this study were reduction in hemoglobin A1C, and improvements in healthy eating, physical activity, and knowledge of diabetes nutrition. There were no differences in weight reduction between the two groups (Lynch et al., 2014).

This study demonstrated the importance of peer support, which is greatly needed among diabetes patients. Group intervention allows participants to share stories and learn from each other. Group intervention could be considered a motivational strategy, because people motivate others to change. These aspects of an education intervention for African Americans with diabetes could be important to improve diabetes self-care markers for these persons.

### *Self-Efficacy*

Self-efficacy is having the confidence and the ability to carry out a given task. The greater the confidence the greater the self-efficacy. Several research studies documented the applicability of the concept self-efficacy to diabetes self-management. Spencer et al. (2011) examined a culturally tailored, behavior-theory-based community

health worker intervention for African Americans and Latino adults with type 2 diabetes for improving blood glucose control. In this study, 164 African American and Latino adults were randomized into a Community Health Worker (CHW) intervention group or a control group. Both groups received information on healthy eating and physical activities. The intervention group received diabetes education and two home visits. The home visits addressed diabetes self-management goal setting. Participants also received one clinic visit with their primary care provider. The program evaluated the following outcome indicators: self-management knowledge, diabetes self-management, diabetes-specific psychological distress, diabetes self-efficacy, physical activity, and dietary practices. Participants' HbA1C and low density lipoprotein (LD) levels were abstracted from medical records. There were several statistically significant outcome indicators, HbA1C at baseline was 8.6 to 7.8% post intervention for the intervention group compared to 8.5% baseline to 8.5% post intervention for the control group. Other statistically significant results noted were a decreased LDL level and improved diabetes knowledge for those in the treatment group (Spencer et al., 2011).

Peek et al. (2012) conducted a study with the objective of testing patient interventions that combined culturally tailored diabetes education and shared decision making training. A total of 21 participants were recruited. The outcome indicators for this study included (1) diabetes self-management, (2) system management, (3) diabetes knowledge, (4) glucose monitoring, (5) self-efficacy, (6) hgbA1C, and (7) LDL levels. Diabetes self-management was evaluated by using the Summary of Diabetes Self-Care scale. There were statistically significant improvements in several outcome indicators

including self-care, glucose monitoring, and A1C levels (Peek et al., 2012). Both of the prior studies highlighted the importance of empowering individuals to take control over their diabetes disease. These findings also demonstrated that diabetes is an illness that can be managed. Both studies focused on culture, which reinforces the importance of developing and implementing cultural specific interventions.

#### *Faith-Based Intervention Studies*

In order to develop appropriate culturally tailored DSME programs for African Americans, consideration for health beliefs, nutritional practices, and religious beliefs must be considered. Spirituality plays an important role in the lives of many African Americans. Spirituality is expressed in all areas of the African American family including work, recreation and well-being. African Americans' spiritual beliefs and practices are considered survival strategies and are considered effective methods for healing (Johnson, Elbert-Avila, & Tulskey, 2005). Some African American families believe that God is responsible for physical and spiritual healing, and the doctor works through God (Johnson, Elbert-Avila, & Tulskey, 2005). Active involvement of healthcare providers and church health representatives (CHRs) with the participants, promote a sense of social support and may influence participant engagement in promoting healthy lifestyle modifications (Frank & Grubbs, 2008).

Because spirituality and religion are an important part of health beliefs for many African Americans, considering these elements may be integral in planning diabetes self-management interventions. Samuel-Hodge et al. (2009) conducted a randomized study

to test the efficacy of a culturally tailored faith-based 12-month intervention for African Americans to improve diabetes self-management. The participants assigned to the special intervention (SI) group received the following: (1) individual counseling and group education sessions, (2) monthly phone contacts, and (3) encouragement postcards, followed by a 4-month reinforcement phase. The participants assigned to the minimal intervention (MI) group were mailed 2 pamphlets, and 3 bimonthly newsletters with general health information. Also, church diabetes advisors (CDAs) facilitated the interventions. The researchers solicited information to determine the following: diabetes self-management behaviors, physiological measures (A1Cs, weight, and blood pressure), diabetes knowledge, and quality of life indicators. A total 201 participants were recruited for the study. Findings indicated significant improvements in diabetes knowledge and diabetes quality of life (Samuel-Hodge et al., 2009). The results of this study showed that the participants in the intervention group demonstrated improvements in diabetes knowledge and quality of life compared to the control group. This study gives insight into the importance and the need for intense diabetes education and confirmed that the traditional method of providing education was less effective. In addition, the study demonstrated the need for culturally tailored diabetes interventions incorporating one-on-one and group strategies to address participants' learning styles. These aspects of intervention design could be important for interventions for African Americans with diabetes.

While the previously mentioned researchers conducted a randomized study, Collins-McNeil et al. (2012), took a different approach. This group of researchers

examined a culturally tailored 12-week faith-based DSME intervention for African Americans. Sessions were led by healthcare providers and clergy persons. This study evaluated diabetes self-management behaviors, psychological behaviors (stress and anxiety), and physiological measures. DSME was delivered through various strategies, including the integration of spirituality into the curriculum. Pre and posttest comparison were used to evaluate the physiological indicators. The appraisal of diabetes self-management was measured with a visual analogue scale (VAS). Depression, anxiety, and stress symptoms surrounding type 2 diabetes were assessed using the Center for Epidemiological Studies Depression Scale (CES-D), Spielberger State-Trait Anxiety Inventory (STAI), and the Perceived Stress Scale (PSS). The findings revealed statistically significant improvements in medication adherence, nutrition, and daily foot checks. There were statistically significant effects on the following outcomes: systolic blood pressure decreased by 9mmHg, there was a 10mg/dL reduction in blood lipids, an increase in high density lipoprotein (HDL) of 4mg/dL and a reduction of 26 mg/dL in triglycerides. Also, intervention participants had an average 5.3 cm reduction in waist circumference, a weight reduction average of 2.2 pounds, and their physical activity increased. Although the other measures were not statistically significantly different, the post-test scores showed improvement in depressive symptoms and hemoglobin A1Cs levels (Collins-McNeil et al., 2012).

This study demonstrated the importance of collaboration among health care providers and clergy in terms of helping persons with diabetes successfully managed their illness. Within this study, the diabetes self-management intervention was delivered by



the health care provider and the clergy person. People who attend church regularly are more likely to participate in health promoting behavior that is, supported by the pastor or clergy. Programs that incorporate health care professionals to deliver diabetes education demonstrate to the participants that the provider cares for them personally and not just professionally.

Gutierrez et al. (2014), conducted a 12- week DSME faith-based feasibility study. The goal of this study was to evaluate a diabetes negative outcomes prevention program for African Americans and Latinos. The intervention was facilitated by a nutritionist and a diabetes educator. The curriculum integrated spiritual and practical principles relating to diabetes self-management behaviors. Several outcome indicators were assessed including: weight, diabetes knowledge, self-management behavior, attitudes, and health-related quality of life. The health-related quality of life was assessed with four questions related to: (1) self-reported knowledge and consumption of healthy foods, unhealthy foods, and healthy food quantity, (2) frequency and duration of physical activity in the prior 30 days, (3) attitudes and motivation regarding food consumption and physical activity, and (4) self-reported changes in energy levels, endurance, general health and levels of stress. The questions were closed-ended using a Likert-type response format. The findings of the study showed improvements in the following areas: diabetes knowledge from baseline (90.8%) to endpoint (97.1%), increased physical activity from baseline (124 days) to endpoint (162 days), and increased healthy eating from baseline (66.7 days) to endpoint (77 days). At the completion of the study, participants reported better physical

endurance (91%), increased energy levels (75%), and a more active lifestyle (Gutierrez et al., 2014).

A program that fosters collaboration between health agencies and faith-based institutions can have compelling effects on quality of diabetes education, poor health prevention, and health promotion. In one program, Johnson et al. (2014) provided DSME that consisted of two components: (a) diabetes knowledge, and (b) support for self-management and behavioral change. The DSME was delivered by an outside agency, and participants received support services from trained case managers (CM) provided by the agency. The program was designed to provide and reinforce DSME in underserved communities. Within this program the CMs collected data through surveys. Outcome indicators included: (1) assistance with diabetes management, (2) diabetes self-care practices, (3) patients' - provider interactions, (4) patient perception about their healthcare provider, (5) health related quality of life, (6) access to the emergency department, (7) confidence level, and (8) the individuals opinion about diabetes self-management (Johnson et al., 2014). The study findings revealed statistically significant improvements in: (a) participant's trust in health care providers, (b) health related quality of life indicators, (c) interaction with health care provider, and (d) support for diabetes self-management, and (e) the clinical measure, A1C from baseline [7.9%] to end point [7.3%]. (Johnson et al., 2014).

Studies demonstrated the importance of collaboration among faith-based institutions and community agencies in terms of screening strategies and helping persons with diabetes managed their illness. One study used the faith-based institution as a

screening site. Designing faith-based interventions for diabetes screening can help in the early identification of diabetes, and with early identification and proper treatment, can lead to a reduction in the negative sequelae associated with poor diabetes self-care. Diabetes self-management education was provided by a community agency. The studies demonstrated the importance of collaboration among communities and faith-based institutions, which can have compelling effects on the African American community of diabetics at large.

#### *Culturally-Tailored Interventions*

The health disparity in diabetes that exists for African Americans is partly because teaching strategies addressing diabetes and self-care management may not take into consideration the health beliefs, nutritional practices, religious beliefs, and socioeconomic status of many African Americans. Traditionally, African Americans have dietary beliefs and physical activity patterns that may have been passed down through generations. These include eating fried foods and foods high in sodium. Community-based approaches have been documented in the literature as being successful in helping African Americans better manage their diabetes. There is clear evidence of the value of culturally tailored interventions for African Americans over the usual interventions implemented in traditional settings. Several studies indicated this outcome.

Collins-McNeil et al. (2012), used a 12-week faith-based approach to diabetes education among African Americans residing in low resource neighborhoods. The methods implemented were culturally appropriate by using culturally targeted written materials, videotapes, and African American presenters to deliver the content. The

participants in this study completed six weekly 2-hours sessions of face-to-face diabetes education and then participants were instructed to practice self-management behaviors independently for an additional six weeks. Study results revealed improvements in dietary habits, diabetes self-care, and metabolic care for the African American participants (Collins-McNeil et al., 2012). Also, Samuel-Hodge et al. (2009) conducted an eight-month faith-based intervention program to improve diabetes self-management among African Americans. The intervention included 12 biweekly sessions lasting 90 to 120 minutes per session. The educational components were conducted in several churches where the participants were predominantly African Americans and four of the sessions were led by health professionals from the community selected by the church diabetes advisor. The findings indicated significant improvements in diabetes knowledge and diabetes related quality of life among African Americans.

McDowell, Wallace, Tillery, and Cencula (2011) examined a 20-week faith-based intervention in a two-year period designed to reduce obesity among African Americans. The interventions were culturally targeted and included nutrition sessions delivered once every two weeks along with physical activity and motivational sessions. The physical activity sessions incorporated traditional and nontraditional activities, such as line dancing and salsa dancing. Each intervention session began and ended in prayer (McDowell et al., 2011). Samuel-Hodge et al. (2009) and McDowell et al. (2011) conducted their intervention over a longer period of time, whereas Collins-McNeil (2012) conducted her intervention over 12 weeks. Although the dosages varied in each of the studies, the findings indicated across the board that culturally tailored approaches in

faith-based settings could produce positive outcomes among African Americans with diabetes.

When identifying major influences for African Americans religion and spirituality are major factors. Faith-based interventions that incorporate active involvement of the pastor fosters a sense of social support and addresses spiritual and cultural values among the participants. Pastors are typically the gatekeepers for access to their church members and are essential in developing a trusting and working relationship among members and communities. Faith-based health teaching can have a lasting effect on church member's behaviors by linking practical principles with biblical principles. Thus, culturally tailored diabetes self-management education in community settings can lead to overall health improvements among African Americans with type 2 diabetes.

### *Summary*

An understanding of the relationships between diabetes knowledge, self-efficacy, symptom management, and self-care practices are needed. Cultural beliefs among African Americans and its influence on diabetes self-management was found in previous studies. The influence and importance of cultural beliefs were integrated into the intervention tested in this study. In addition, length, content, and type of intervention were considered and addressed in the current study.

Community-based nursing research continues to be necessary in the African American community to determine the best way to educate the population about diabetes and diabetes self-management. Developing and implementing culturally tailored diabetes self-management interventions in community-based settings may help reduce the diabetes

disparities plaguing African Americans. This literature review provided evidence supporting the effectiveness of and ongoing need to design and test community-based diabetes self-management interventions. The study that was conducted utilized strategies, content, measures, cultural tailoring, faith-based messages, and community immersion to develop, implement, and evaluate the intervention and its efficacy.

## **CHAPTER III**

### **METHODOLOGY**

This chapter describes the methodology of the study. It includes the study design, sample, site description and data analysis. The measureable variables evaluated are described and the evaluation instruments included. Data analysis methods employed are described.

#### *Design*

A quasi-experimental design with one group pre-test post-test design was used to test a 6-week pilot study of a faith-based diabetes self-management program for African Americans aimed at helping the participants acquire diabetes knowledge and skills that could result in improvement in diabetes self-management through increased self-efficacy and symptom management.

The goals of the project were that after receiving a 6-week faith-based intervention, participants would show significant improvements from pre to post intervention in:

Hypothesis 1. Diabetes knowledge, self-efficacy, and diabetes symptoms management.

Hypothesis 2. Outcome of proper diabetes self-management (physical activity, diet, medication, glucose monitoring, and daily self-foot checks).

### *Setting*

The study was conducted at two local African American churches located in the south-eastern part of the United States. Each congregation had over 300 members, predominately African Americans. Worship services were conducted twice on Sundays for one church and once on Sundays for the other church. In addition, each church conducted midweek services on Wednesdays at 12 noon and at 1900 for Bible study. Both churches are active and visible in the black community.

### *Sample*

A convenience sample of 32 African Americans 18 years or older who met the criteria for inclusion were recruited into the study. The study sample included participants with a self-reported diagnosis of Type 2 diabetes made by a health provider. Further inclusion criteria included the ability to speak and read English and ability to complete surveys. Exclusion criteria included: diabetes as a secondary diagnosis, patients with type I diabetes, having participated in a diabetes self-management program during the past year, pregnant women, and diabetes complications that would impede responses to questionnaires.

### *Recruitment*

The Principal Investigator (PI) recruited a convenience and snowball sample of participants with the assistance of liaisons (Pastors and Parish Nurses) identified from each church. The congregation was introduced to the program through pulpit announcements, posted flyers on bulletin boards, and announcements printed in the church bulletins. Information sessions were held to provide information to all interested



participants who attended church services at various times, prior to the start of the program. The purpose of the information sessions was to provide an overview of the program and to answer any questions about participation. The PI used a script to introduce the study; the same script was used at each information session. Congregants who expressed interest in participation were contacted by the PI in person or by telephone, for eligibility determination and to provide initial answers to questions about participation in the study. The PI scheduled enrollment visits at each church for interested persons for consent signing, hemoglobin A1C and weight measurement, and completion of a set of questionnaires pre-intervention (baseline). Participants were informed of the date and time to return to the church for the initiation of the diabetes educational sessions. At the end of the educational sessions (6-weeks), the participants were informed of the date and time to return to the church for post intervention questionnaire completion.

Participants' were asked to provide their contact numbers and e-mail addresses prior to beginning the research study, so that the PI could send announcements, phone call reminders, and email messages to participants about homework and upcoming sessions or data collection. The educational sessions were held on Sundays after morning and evening worship services depending on preference of each site group. The PI delivered all of the sessions at the two sites, staggering the start date at the second site two weeks later.

### *Data Collection*

The PI collected data through self-reports using a set of questionnaires during enrollment days prior to the start of the program. Participants were offered assistance in completion of questionnaires in a confidential manner to avoid any embarrassment or literacy concerns. The PI and a trained community research assistant (RA) were the two African-American data collectors in this study, and this procedure may have fostered a sense of trust and may have minimized attrition. The RA attended a 1-hour training workshop led by the PI on data collection, viewed a power point slide on human subjects' protections, and signed a confidentiality form provided by the University's IRB. The PI was present and led all data collection sessions.

Clinical measures included obtaining hemoglobin A1C levels and weights at baseline. Participants were provided scheduled time slots at 20 minute intervals for A1C and weight measurement to ensure adequate time for data collection. The questionnaire data collection occurred on pre-intervention enrollment days and at the end of the study at each church in private areas provided by the facility. The questionnaires were administered in the following order: The Summary of Diabetes Self-Care Activities (SDSCA) Scale, Diabetes Empowerment Short Form (DES-SF) self-efficacy scale, and the Diabetes Symptoms Checklist –R (DSC-R) scale for participants to complete independently (or with literacy assistance) in the designated areas of the church. Location of data collection was done to ensure privacy and confidentiality for all participants. The Spoken Knowledge in Low Literacy in Diabetes (SKILLD) scale was administered verbally to each participant by the PI. The Diabetes Self-Management

Participant Questionnaire Measurement was used to collect date of birth, marital status, years of education, race/ethnicity, gender, employment, comorbidities, and diabetes related inquiries. The PI remained present throughout the completion of the questionnaires to be available for any questions, literacy issues, or visual deficits requiring assistance. The time for completing all questionnaires was 45 to 60 minutes.

At the end of the program the participants returned to church one week after program completion for the post data collection process. The participants signed and received the gift card incentives (see Table 3.) at weeks one, and three, and at the end of the program, after the post data collection.

**Table 3. Participants’ Incentive Schedule**

<u>Session</u>	<u>Incentive</u>
Week 1	\$5.00 Walmart gift card and a calendar
Week 2	Diet dairy
Week 3	\$10.00 Walmart gift card, and Pedometer
Week 4	Blood glucose log
Week 5	Diabetes recipe book
Week 6	Silicone wristband with T2D engraved
Post data collection	\$15.00 Walmart gift card

*Measures*

The Diabetes Self-Management Participant Questionnaire Measurement demographic questionnaire requested the following: age, gender, race, employment inquires, marital status, learning style, level of education, smoking status, lifestyle habits, weight and height, and diabetes related questions.

### *Hemoglobin A1C*

Tight glycemic control or blood sugar values that remain within a specific range can prevent or slow the progression of diabetes complications (American Diabetes Association [ADA], 2011). Hemoglobin A1C is a value that determines the adequacy of diabetes therapy. According to the American Diabetes Association [ADA], (2011) a target value for hemoglobin A1C of less than 7% is desirable for adequate blood sugar control. A hemoglobin A1C level was obtained by the pricking of a finger by the PI from all participants. The instrument that was used to measure the hemoglobin A1C was an over-the-counter *Bayer A1C Now test kit*, similar to the point of care kits used in many community settings.

Chang, Frank, Knaebel, Fullam, and Pardo (2010) conducted a study to evaluate the accuracy of an over-the-counter glycosylated hemoglobin (A1C) test kit. A total of 221 participants and 110 health care professionals completed the A1CNow SelfCheck test. The findings of that study indicated, of the 177 participants A1C values, 165 (93.2%) were within adequate range with a correlation value at 0.93 respectively (Chang et al., 2010).

### *Body Mass Index (BMI)*

According to the CDC an adult who has a BMI between 25 and 29.9 is considered overweight, and an adult who has a BMI of 30 or higher is considered obese (CDC, 2015). Anthropometric measurements were taken at baseline by the PI. Heights were obtained without shoes to the nearest 0.1 cm with a stadiometer. Body weights were

obtained on an electronic weight scale. BMI were calculated by dividing body weight (in kilograms) by the square of height [in meters] (CDC, 2015).

*The Spoken Knowledge in Low Literacy in Diabetes Scale (SKILLD)*

The Spoken Knowledge in Low Literacy in Diabetes Scale (SKILLD), a 10 item questionnaire, was developed to assess patient knowledge about diabetes self-care, including glucose management, lifestyle modifications, the identification and treatment of acute complications, and suitable activities to prevent long-term consequences of poorly controlled disease. The questions are written below the fifth-grade level on Flesch-Kincaid testing. Participants were asked open ended questions that allowed the participants to explain the responses. The total scores were summed and ranged from 40-90% with high scores > 50% indicating a higher level of diabetes knowledge (Rothman et al., 2005). Construct validity was verified by a higher knowledge level among participants who had been diagnosed with diabetes for a longer time period, were on insulin for disease management, and who had lower HbA1c levels.

Patient burden was marginal with use of the SKILLD scale with relation to time required for (10 minutes or less), verbal administration style, and readability level. The SKILLD scale is useful in assessing diabetes knowledge among those from vulnerable populations, and results help to identify topics of diabetes management that need additional attention. The Kuder Richardson (KR- 20) coefficient for the SKILLD scale for this study was .51 with the removal of question 3. Some of the questions from the SKILLD scale were not clearly written. According to the literature there have been some issues regarding the clarity of some of the questions from the SKILLD scale (Jeppesen,

Hull, Raines, & Miser, 2012; Pena-Purcell, & Boggess, 2014; Garcia, Zuniga, Reynolds, Cairampoma, & Sumlin, 2015).

*The Diabetes Empowerment Scale-Short Form (DES-SF)*

The Diabetes Empowerment Scale-Short Form (DES-SF) is an 8-item questionnaire developed to assess psychosocial efficacy of people with diabetes. Participants were asked their perceived ability to the questions “in general I believe that I...” and offers the response option of “strongly disagree” (1) to “strongly agree” (5). The total scale scores were summed, higher scores ( $>3$ ) indicates positive attitudes and will be interpreted as a higher level of self-efficacy, and lower scores ( $\leq 3$ ) indicates a lower level of self-efficacy (Anderson, Fitzgerald, Gruppen, Funnell, & Oh, 2003). The Cronbach’s alpha for this instrument in that study was 0.80 (Schwarz, 1999). The estimated completion time for this scale is five minutes and the Cronbach’s alpha for this instrument in this study was .80, indicating adequate reliability for this scale. Utz et al. (2008) conducted a culturally tailored intervention for African Americans with type 2 diabetes. In that study the researchers measured self-efficacy by the Diabetes Empowerment Scale-Short Form (DES-SF) with the Cronbach’s alpha at 0.84 and construct validity was supported by a recent study (Utz et al., 2008).

*The Diabetes Symptoms Checklist Revised (DSC-R)*

The Diabetes Symptoms Checklist Revised (DSC-R) scale is a 34 item questionnaire developed to assess diabetes symptoms that measures symptom frequency, and severity during the past month. The DSC-R were analyzed based on eight domains: psychological fatigue, psychological cognitive, neurology pain, neurology sensory,

cardiology, ophthalmology, hypoglycemia, and hyperglycemia. Participants were asked to note the inconvenience of symptoms of diabetes with a response option of “yes”(1) or “no”(0) to symptom occurrence followed by a rating of symptom troublesomeness (1-5). Items scores are the sums of the symptom occurrence and troublesomeness, with a maximum score of six per item. According to Arbuckle et al. (2009) items are summed to form domain scores and all the items of the DSC-R can be summed together to form a total score. Higher scores indicate greater symptom burden (Arbuckle et al., 2009). The Cronbach’s alpha for this instrument in this study was .80, and the Cronbach’s alpha of each subscale were: a) psychology fatigue .66, b) psychology cognitive .63, c) neurology pain .40, d) neurology sensory .64, e) cardiology .35, f) ophthalmology .35, g) hypoglycemia .60, and h) hyperglycemia .40. The DSC-R was validated and used in individuals with type 2 diabetes with a Cronbach’s alpha of .79 (Naegeli, Stump, & Hayes, 2010). Validity of the instrument has been established in populations including African Americans by significant correlations between the DSC and the study participants’ self-report of the number of times they were seen by a healthcare provider, number of days too sick to work and whether they had been hospitalized during the prior 3 months (Sacco, Bykowski, & Mayhew (2013).

#### *The Summary of Diabetes Self-Care Activities Scale (SDSCA)*

The revised Summary of Diabetes Self-Care Activities scale (SDSCA) is a short self-report instrument for measuring the frequency of diabetes self-care across the different components of diabetes regimens. The tool was designed to measure the frequency of self-care behavior activities over the previous seven days (Glasgow &

Anderson, 1999). The revised SDSCA is an 11-item self-report questionnaire. Participants' were given number scores for each component (exercise, diet, foot care, and blood glucose testing) creating item scales evaluated by the revised SDSCA tool. Numerical scoring of items were based on the number of days of the week that the behavior was performed using a 7-point reply format. The total scores range from 0 - 77 points, higher scores indicated more days that participants performed self-care activities (Chen, Chien, Kang, Jeng, & Chang, 2014). The summed scores of each item were used in this study. The completion time for the SDSCA was 5 to 10 minutes. The test and re-test reliabilities for the subscales for this instrument were: diet .53, exercise .46, blood glucose .11, and foot care .16, and the Cronbach's alpha for this instrument was .70. This scale is widely used in the assessment of diabetes self-management practices and has been examined in African Americans with diabetes. The inter-item correlations within prior studies were 0.47, and the correlations with other variables support validity of subscales at 0.23 (Wallston, Rothman, & Cherrington, 2007; Utz et al., 2008; Spencer et al., 2011; Peek et al., 2012).



**Table 4. Bandura’s Conceptual Framework for Diabetes Self-Management**

<b>Construct</b>	<b>Concept</b>	<b>Operational Level</b>	<b>Data Collection</b>
Person	Diabetes Knowledge	The Spoken Knowledge of Low Literacy in Diabetes Scale (SKILLD)	Pre-test, Post-test
	Symptom Management	Diabetes Symptom Checklist, DSC-r	Pre-test, Post-test
	Diabetes Self-efficacy	Empowerment Scale SF (DES-SF) Revised	Pre-test, Post-test
Behavior	Diabetes Self-Management	Summary of Diabetes Activities Scale (SDSCA)	Pre-test, Post-test

*DSME Intervention*

The DSME intervention included six weekly one hour class sessions held on Sunday mornings and Sunday evenings directly after worship services. The first day began session one with a re-introduction of the program and the beginning of the first diabetes self-management class. The remaining five sessions were held and included modules on health eating, being active, medications, glucose monitoring and complications, and symptoms management. The sessions focused on areas of diabetes self-management based on the American Diabetes Association (ADA) guidelines: (1) Introduction to diabetes (prevalence’s, signs and symptoms), (2) Healthy eating, (3)

Being active, (4), Medications, (5) Glucose monitoring and complications, and (6) Symptom management (ADA, 2011). The diabetes education curriculum (Table 5.) was adopted from the Advancing Diabetes Self-Management program at Community Health Center in Middleton CT, that was developed with support from the Robert Wood Johnson Foundation. This program is based on the standards of diabetes care recommended by the ADA (Diabetes Initiative Community Health Center, 2009)

The sessions occurred at two African American churches led by an African American professional. The African American professional felt that it was important to build rapport with participants' and church leaders. This was accomplished by attending and participating in bible study and worship services prior to and during the intervention study. Each session began with a scripture verse, and the materials and presentations displayed African American images. Also, participants' were given assignments to complete outside of the sessions and the PI verified completion by checking each participant's calendar, diet journal, and glucose log. This process reinforced goal setting and planning. For participants who did not have a glucose monitor, a monitor was provided to the participants by the PI. The PI trained participants who had never checked their blood sugars with a one-on-one consultation after the class sessions. In addition, healthy meals were provided with each session.

The topics for each session was as follows:

**Session 1:** Diabetes in African Americans, prevalence, and signs and symptoms.

Therefore, the topic for session 1 focused on defining diabetes and signs and symptoms of diabetes, and the prevalence of diabetes in African Americans. The participants were

asked to share their feelings about the diagnosis of diabetes and their successes and struggles with diabetes self-management.

**Session 2:** Carbohydrates, fats, and protein. The topic for session 2 focused on the impact of carbohydrates, fats, and proteins on blood glucose levels, the importance of portion control, being consistent with the quantity of carbohydrates intake with each meal, and the daily recommended amount of carbohydrates based on the American Diabetes Association (ADA) guidelines. Each participant received a diet journal that included an index of foods with serving sizes and carbohydrates count.

**Session 3:** The topic for session 3 focused on being active and the positive aspects of physical activity. Reviewed and discussed meal planning goal for last session.

**Session 4:** Medications, the session focused on types of medications, mechanism of actions, side effects and adverse effects, and the importance of medication adherence. Reviewed and discussed physical activity goal from last session.

**Session 5:** Glucose Monitoring and Diabetes Complications. The topic for session five focused on normal and abnormal glucose levels and diabetes related complications.

**Session 6:** The topic for session 6 focused on diabetes symptoms and symptom management. Reviewed and discussed glucose monitoring for last session. See table 5 for detailed curriculum.

**Table 5. Application of the Social Cognitive Theory in the DSME Intervention**

<b>Sources of Outcome Expectation</b>	<b>Intervention Strategies</b>	<b>Content and scripture verse for the day</b>	<b>Teaching Methods</b>
<i>Physiological and emotional states</i>	<b>Group discussion</b> Participants shared their feelings about the diagnosis of diabetes including their successes and struggles.	<b>Session 1</b> (3 John 1:2) <b>Diabetes in African Americans: Prevalence, signs, and symptoms.</b>	1. Presentation of a poster displaying statistics, signs and symptoms of diabetes. Discussion about diabetes
<i>Social Persuasion</i>	<b>Group discussion</b> 1. Participants discussed the impact of carbohydrates on blood glucose levels. 2. Participants discussed carbohydrate foods that have the greatest effect on blood glucose levels. 3. Participants discussed the impact of protein on blood glucose levels and identified healthier proteins to include in their intake.	<b>Session 2</b> (1 Corinthians 6:19) <b>Carbohydrates, Fats, and Protein</b> <ul style="list-style-type: none"> <li>• Discussed the impact of carbohydrates, protein and fat on BG</li> <li>• Reviewed the sources of carbohydrate.</li> <li>• Carbohydrates are necessary for important body functions.</li> <li>• Carbohydrate foods raise blood glucose regardless of the source. Will stress to participants that milk, fruit, and bread raise</li> </ul>	1. Discussion 2. Presented a poster presentation: displaying foods appropriate for African Americans with diabetes.

**Take home activity  
(Planning)**

1, Participants planned a healthy meal, recorded in the diet diary and returned the following session to discuss their successes and struggles.

blood glucose just as a cakes and sweets.

- Reviewed sources of protein.
- Stressed that proteins are necessary for important body functions.
- Proteins affect blood glucose levels but at a lesser impact.
- A source of protein should be included at each meal.
- Choose very lean and lean protein.

*Vicarious experiences*

**Group discussion**

1. Participants discussed the importance of physical activity and its impact on blood glucose levels.  
2. Participants were able to discuss the relationship between diet, exercise, and medication and its effects on glucose.

Session 3(*James 2:17*)

**Being Active:**

- Stressed to participants to never begin an exercise program without check with your primary care provider.
- Stressed the positive aspects of physical activity.
  1. Lowers blood glucose levels
  2. Helps maintain and achieve a healthy body weight.

First half of the session: promoted group discussion to allow participants to discuss their success and struggles with meal planning.

Second half of the session: a poster presentation: displaying African Americans being physical active.

**Take home activity  
(Goal setting)**

1. Recorded in their calendars the number of times exercised for 1 week and included the duration and type of exercise. The participants shared their experience the following week

3. Helps to keep heart and lungs healthy.

4. May improve blood pressure.

- Discussed reasonable goals for beginning an exercise program. Strive for 30-45 minutes per day. Start out slow, increase minutes gradually, exercise. For example exercise 10 minutes three times per day.
- Stressed any amount of exercise is better than none.
- Always carry identification and a quick acting carbohydrate.
- Comfortable shoes, and visually check the inside of the shoe before it is worn.
- Wear comfortable socks, cotton socks preferably.
- Discussed that diabetes therapy may be managed by various treatment modalities.
  1. Diet and exercise
  2. Diet, exercise, and oral medication

3. Diet, exercise, oral medication, and insulin

- Importance of maintaining a healthy body weight is one of the keys to managing diabetics. Being overweight makes insulin less able to do its job (keeping glucose levels normal in the blood). Losing even a small amount of weight helps lower the blood glucose levels.
- Physical activity helps to decrease blood glucose levels and other aspects of health.

### **Group discussions**

1. Participants described the basic action of the medications that may be utilized to control diabetes
2. Participants discussed the side effects of medications, and when to notify their health care provider.

### **Session 4:** (1 John 4:4)

#### **Medications**

- Types of medications, mechanism of action, and side effects.
- Stressed the importance of medication adherence.
- Types of insulin and non-insulin medications

First half of the session: promoted group discussion to allow participants to discuss their success and struggles with physical activities.

Second half of the session: present medications (oral and insulin) regimens.

3. Participants understood the function of insulin and why it might be used to manage diabetes.

#### **Group Discussion**

1. Participants shared their experiences with self-blood glucose monitoring.  
2. Participants discussed the potential complications of poorly manage diabetes.

#### **Take home activity: Planning and goal setting**

1. Record one fasting glucose for one week in your glucose journal.

#### **Sessions 5: (Hosea 4:6)**

#### **Glucose Monitoring/Diabetes Complications**

- Cardiovascular disease
- Eye damage
- Kidney damage
- Nerve damage

#### **Discussion**

Images displaying African Americans experiencing diabetes related complications

Discussed fasting blood sugar goal and postprandial goal.



2. Record one post prandial glucose reading for one week in your glucose journal, (bring journal to next session for discussion)

*Mastery experiences*

**Group discussion**

1. Participants were able to distinguish between hypoglycemia and hyperglycemia.  
2. Participants will define the appropriate action(s) to take if experiencing hypoglycemia.

**In class activity: reinforcing information**

1. Participants wrote down signs and symptoms of hypo/hyperglycemia on a sheet of paper provided by the PI.  
2. Participants wrote down treatments for

**Session 6: (Philippians 4:13) Symptom Management**

- Discussion of hyper/hypoglycemia
- Signs and symptoms
- Treatment

First half of the session: promoted group discussion to allow participants to share their experiences with glucose monitoring.

Second half of the session: Discussion about symptom management.

hypoglycemia on a  
sheet of paper  
provided by the PI.

### *Duration*

According to the American Diabetes Association (ADA), DSME is the process of obtaining knowledge, skill, and capability necessary for diabetes self-care (ADA, 2011). This process incorporates skills necessary to make informed decisions, to do goal setting, and to learn to manage the demands of living with diabetes. It is guided by evidence-based standards (Haas et al., 2012). DSME programs vary in terms of intervention, duration, mode of delivery, and settings. DSME have been provided by nurses, pharmacists, dieticians, community health representatives, and other health care professionals.

This diabetes self-management educational program intervention in the current study was a pilot study conducted over a six week period, with six weekly one-hour educational sessions and participants practicing self-care behaviors independently and concurrently within the 6-week sessions. The participants were given activities to complete outside of the face-to-face sessions, and the activities included planning and goal setting. The activities were monitored by the PI to ensure completion of the activities. This technique reinforced self-efficacy and accountability for participants' own self-care. The rationale for this short duration is because of the many challenges encountered for approval of the study within each church. Many African American faith-based institutions have health ministry committees who are responsible for the health and wellness of their congregation. The health ministry is responsible for health education and health screening activities within their perspective churches. Thus, this makes it more challenging for researchers outside of the community to conduct studies within the

church. The PI for the current pilot study had to negotiate with each of the church administrators for a duration that was appropriate and not to be an inconvenience to the congregation. Therefore, this six-weekly one-hour sessions study was accepted and approved by each church administrator.

#### *Data Analysis Plan*

Descriptive statistics such as frequency and percentage or mean (M), standard deviation (SD), and minimum and maximum were used to describe characteristics of the sample and pre- and post-test measures. Paired-*t*-tests were planned for examining differences pre to post on the major variables. Distribution tests were conducted for the major continuous outcomes using skewness, kurtosis, box plots, and Kolmogorov-Smirnov tests. The nonnormality of the variables required use of a nonparametric dependent samples test. The Wilcoxon Signed Rank Tests were used to examine difference in diabetes self-management before and after the intervention. There are three assumptions to the Wilcoxon Signed Ranked Test that were checked and met to yield valid results: (1) the dependents variables were measured at the ordinal or continuous level, (2), the independents variable consisted of two matched pairs, and (3) the distribution of the differences between the two matched pairs was symmetrical in shape. These examinations were accomplished by using box plots (Polit, 2009). The onsite presence of the PI and the research assistant helped to prevent missing data, by quickly scan the questionnaires while the participants were present. A review of the data indicated less than 1% missing data and no imputations or transformations of outcome data were required by standard best practices (Schlomer, Bauman, & Card, 2010). A

probability level will be established at  $p < .05$ . A probability level was established at  $p < .05$ . All analyses were performed in SPSS v21 (IBM SPSS, Chicago, IL).

#### *Power Analysis*

Power analyses were calculated to determine an appropriate sample size using G\*Power, an online tool to compute statistical power analyses. At a significance level of  $p \leq 0.05$  with power of 80%, and a medium effect size of  $f = 0.50$ , the analysis indicated a sample size of  $N = 27$  was needed (Polit, 2009). Considering the estimated attrition rate (10%), a sample size of up to 35 participants was deemed adequate for this study. An attrition rate of 10% was estimated based on a previous faith-based study conducted by the PI with 100% retention rate.

#### *Human Subjects Protection*

Prior to initiating the study, the principal investigator (PI) met with the Pastor and Parish Nurses at each church to discuss the details and implementation phase of the study. An Institutional Review Board (IRB) application was submitted and approved by the University of North Carolina at Greensboro. The participants who elected to participate in this study were asked to take part in a diabetes self-management education study. The participants were informed that the PI anticipated minimum risks for this study such as discomfort from finger sticks and potential injuries from performing physical activity. Instructions on how to prevent potential injuries from performing physical activities was provided at the intervention session meeting. All information collected in this study were kept confidential in the password computer of the PI and hard copies of data were kept locked in the researcher's file cabinet in her home.

Identification coding allowed the PI to link the participants' data with the correct participant pre and post data collection. Participants were informed that their participation was voluntary, and that they could end study participation at any time. Potential participants were also informed that; refusing to participate or leaving the study at a later time would not result in any penalty. The participants were informed that there were no respondent identifiers, only coded numbers, used with this data to ensure confidentiality. The participants were told that if they had any questions about their involvement in this study, they could contact the Office of Research Integrity or Institutional Review Board (IRB), or the PI.

### *Summary*

This was a pilot study with African Americans who had diabetes. This study tested a six-week pilot faith-based DSME intervention for African-American adults with T2DM. The sample were recruited from two African American Churches. Two African Americans collected data and implemented the intervention protocol- the PI, a registered nurse and practitioner, and a research assistant. Tools were selected to measure the major concepts of diabetes knowledge, self-efficacy, diabetic symptoms and diabetes self-management.

Because community faith-based approaches have been documented in the literature as being successful, an intervention that included a faith-based institution and strategy was used in the study. This study utilized a quasi-experimental design to examine the effects of a faith-based intervention on self-management behaviors, symptom management, self-efficacy, and diabetes knowledge in African American adults

diagnosed with diabetes. Interventions were targeted to the person and behavior components of the Social Cognitive Theory. Wilcoxon Signed Ranked Tests were used to examine differences in the study outcomes before and after the intervention.

## CHAPTER IV

### RESULTS

This chapter presents the findings of the diabetes self-management study. A one-group pre-test post-test design was used to examine knowledge about diabetes and diabetes self-management practices, lifestyle behaviors, and knowledge about symptom management through measurements prior to starting the program and after completion of the program for a group of African American adults. The sample description, the analysis for each hypothesis and statistical tests are presented in this chapter. Results are reported with measures of central tendency and statistical significance. Reliability coefficients for the scales were computed. The data were collected from two predominately black churches located in the southeastern part of the United States.

#### *Demographic Characteristics of the Sample*

The sample consisted of 32 participants who were originally recruited and who completed both the pre-screening and pre-testing process. The demographic characteristics for the study participants can be found in Table 1. Of the 32 participants, 28 (87.5%) completed the six-week program. Fifteen participants (53.6%) completed the study from one church (of the 18 recruited) and thirteen participants (46.4%) completed the study from the other church (of the 14 recruited). Four participants did not complete the program and three withdrew and never started the intervention. One started the



intervention and withdrew with no specific reason. Of the four participants who withdrew from the study, two were women (50%) and two were men (50%).

*Participation in Self-Management Program*

The participation rate in the different classes that comprised the diabetes self-management program (i.e., prevalence of diabetes in African Americans, healthy eating, importance of being active, medications, glucose monitoring, and symptom management) ranged from 82 to 96 percent. Sixteen participants (57.1%) attended all of the sessions and 7 (25%) participants missed only one session. There was a retention rate of 88 percent for six weeks of attendance (Table 6).

**Table 6. Participation in Diabetes Self-Management Program**

Program Content	n	%
Diabetes in African Americans: Prevalence, signs, and symptoms	23	82
Carbohydrates, Fats, and Protein	26	93
Importance of Being Active	23	82
Medications	24	86
Glucose Monitoring/Diabetes Complications	25	89
Symptom Management	27	96

\*n(%)

*Demographic Site Differences*

Of the 28 persons who completed the study, site differences were examined for baseline data. An independent sample *t*-test was conducted to examine whether there were statistically significant differences for participants' age, hemoglobin A1Cs, or duration of diabetes between the different church sites where the programs were held.

There were no statistically significant differences between sites on the mean values for age, hemoglobin A1Cs, or duration of diabetes for participants. Table 7 displays these results.

**Table 7. Examining Site Differences for Baseline Variables**

	t	df	Sig. (2 tailed)
Age	-.028	21.93	.978
Hemoglobin A1C	.617	24.50	.543
Diabetes Duration	.314	25.92	.756

The sample of 28 participants used for data analysis consisted of 21 females (75%) and 7 males (25%). All of the participants identified their ethnicity as African American. The age range of the participants was from 32 to 83 years, with a mean of 61 years (SD = 13.9). Sixteen (50%) of the participants were unemployed. Twenty-five (89%) of the participants graduated from high school and/or had some college education. The majority of the participants were married (57.1%). The duration of diabetes for the participants ranged from 1 to 25 years, with a mean duration of 5.79 years (SD = 6.23) and more than half had experienced the diagnosis of diabetes for 5 years or less. The participants' diabetes regimens included: diet and exercise alone, insulin, non-insulin injections (glucagon-like peptide-1), and oral hypoglycemic agents. The majority of the participants were on oral hypoglycemic agents.

**Table 8. Demographic Characteristics of the Study Sample (N=28)**

Characteristics	n	%
Gender		
Females	21	75
Males	7	25

Age Group		
30-40 years	3	10.7
41-50 years	2	7.1
51-60 years	9	32.1
61-70 years	6	21.4
71 years or greater	8	28.6
Employment		
Full time	12	42.9
Part time	2	7.1
Other	14	50.0
Education		
Less than High School	3	10.7
High School	12	42.9
College/Graduate School	13	46.4
Marital Status		
Single	6	21.4
Married	16	57.1
Other	6	21.4
Diabetes Duration		
1-5 years	19	67.9
6-10 years	4	14.3
11-15 years	2	7.1
16-20 years	2	7.1
21 years or more	1	3.6
Diabetes Regimens		
Diet and exercise only	8	28.6
Oral hypoglycemic agents	16	57.0
Insulin only	1	3.6
Insulin plus oral agent	1	3.6
Noninsulin plus oral agent	1	3.6
Noninsulin only	1	3.6

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\*Note. Due to rounding and missing values totals may not reflect 100%

Two baseline clinical measures, obesity level and hemoglobin A1Cs levels, were obtained to evaluate the participant’s progression of their diabetes, to provide motivation for change, and for future follow-up. The A1Cs and weights were obtained at baseline only. This was due to the short duration of the study, it would not be anticipated that the A1C levels or weight would change appreciably over just six weeks. The participants’ weights and heights were converted into Body Mass Index (BMI). The BMIs were calculated by dividing body weight (in kilograms) by the square of each participant’s height (in meters). The baseline BMI of the sample ranged from 24 to 56 with a mean BMI of 35.4 (SD = 7.13). Twenty-two (78.5%) of the sample participants were classified as obese (Table 9).

**Table 9. BMI of Sample Participants (N=28)**

BMI Categories	n	%
BMI 18.5 - 24.9 (healthy weight)	1	3.6
BMI 25-29 (overweight)	5	17.9
BMI 30 or higher (obesity)	22	78.5

\*n (%) BMI categories, (CDC, 2015).

The baseline hemoglobin A1C values of the sample ranged from 5.8 to 13 percent with a mean A1C of 7.6 percent (SD = 1.78). Fourteen (50%) participants had poor glycemic control which was defined as greater than 7%. Based on the American

Diabetes Association (ADA), (2011) a hemoglobin A1C of less than 7% is desirable for adequate glycemic control (ADA, 2011) see Table 10.

**Table 10. Glycemic Control of Sample Participants (N=28)**

Hemoglobin A1C values	n	%
A1C $\geq 7$ poor glycemic control	14	50%
A1C $< 6.99$ adequate glycemic control	14	50%

ADA, 2011

### *Hypotheses Testing*

*Hypothesis 1.* After receiving a 6-week faith-based intervention, participants will show significant improvement from pre- to post- intervention in the

1. diabetes knowledge
2. self-efficacy
3. diabetes symptoms management.

The difference in pre- and post- test diabetes knowledge was determined by using the Wilcoxon Signed Rank Test. This technique was chosen because the sample data were not normally distributed, which violates one of the assumptions of the *t*-test. The Wilcoxon Signed Rank Test was chosen to determine if group means for the pre- to the post- test differed from each other in the area of diabetes knowledge. The findings revealed significant improvements from the pre- to the post-test on diabetes knowledge (Table 11).

**Table 11. Differences in Total Item SKILLD Scores Pre- and Post-test (N=28)**

Pre N = 28 Mean (SD)	Post N = 28 Mean (SD)	Z	<i>p value</i>
32.14(13.71)	67.14(15.12)	-4.428	<.001

Standard deviation (SD)

Wilcoxon Signed Ranks Test Comparison of Participants' Pre- and Post-test Spoken Knowledge in Low Literacy in Diabetes (SKILLD)

	n	Mean Rank	Sum of Ranks
postSKILLD_0 to100_ percent- preSKILLD_0to100_ percent	2	2.75	5.50
Negative Ranks			
Positive Ranks	25	14.90	372.50
Ties	1		
Total	28		

Scores less than or equal to 50% indicated low diabetes knowledge and scores greater than 50% indicated high diabetes knowledge (Table 12). Despite the fact that the Cronbach's alpha indicated weak reliability, the study results indicated significant changes in diabetes knowledge from pre- to the post-intervention. Specifically, more than 82% of the sample moved from low knowledge to high knowledge after the intervention.

**Table 12. Changes in Participants' Diabetes Knowledge Scores Pre- to Post-test**

Diabetes knowledge variable	Pre	Post
High diabetes knowledge >50%	3	23
Low diabetes knowledge ≤ 50%	25	5

The difference in self-efficacy behaviors by participants were determined by using the Wilcoxon Signed Rank Test. The Wilcoxon Rank Test was used to determine if group means for the total scale scores differ from each other in the areas of self-efficacy. There were statistically significant changes in the total scores of the DES-SF from the beginning of the self-management program to completion in managing the psychosocial aspects of diabetes. This result indicated that self-efficacy improved after the intervention (Table 13).

**Table 13. Differences in Total DES-SF Scores from Pre- to Post-test (N=28)**

	Pre n = 28 Mean (SD)	Post n = 28 Mean (SD)	Z	p Value
	3.75(1.72)	4.56(.53)	-2.894	.004

Standard deviation (SD)

Wilcoxon Signed Ranks Test Comparison of Participants' Pre-test and Post-test Diabetes Empowerment Scale-Short Form (DES-SF) Scores

		n	Mean Rank	Sum of Ranks
postDES_tot - preSDES_tot	Negative Ranks	5	11.00	55.00
	Positive Ranks	20	13.50	270.00

Ties	3
Total	28

Table 14 displays the individual items with improvements noted from pre to post intervention in the psychosocial areas of self-efficacy.

**Table 14. Diabetes Empowerment Scale Short Form Scores from Pre- to Post-test**

Self-efficacy variables		Pre Mean (SD)	Post Mean (SD)
Item 1	know what part of diabetes care I am dissatisfied with. Post - know what part of diabetes care I am dissatisfied with	3.50(1.68)	4.36 (1.13)
Item 2	able to turn diabetes goals into workable plan Post – able to turn diabetes goals into workable plan Pre	4.00(1.31)	4.75(.645)
Item 3	try out different ways of overcoming barriers to goals Post – try out different ways of overcoming barriers to goals	3.86(1.53)	4.43(1.03)
Item 4	can find ways to feels better about having diabetes Post – can find ways to feels better about having diabetes Pre	3.68(1.54)	4.57(.742)



Item 5	know positive ways I cope with diabetes stress Post	3.54(1.30)	4.46(.744)
Item 6	– know positive ways I cope with diabetes stress Pre can ask for support for diabetes when I need it Post - can ask for support for diabetes when I need it Pre	4.14(1.21)	4.71(.535)
Item 7	know what helps me stay motivated to care for my dia. Post - know what helps me stay motivated to care for my dia. Pre	3.61(1.71)	4.57(.690)
Item 8	know about myself to make diabetes choices that are right Post - know about myself to make diabetes choices that are right Pre	3.64(1.52)	4.61(.832)

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Further investigation showed that at baseline twenty-one (75%) participants had higher levels of self-efficacy and at the completion of the study twenty-eight (100%) participants had higher self-efficacy. Seven persons moved from low self-efficacy to high self-efficacy after the intervention (Table 15).

**Table 15. Changes in Participants' Self-Efficacy from Pre- to Post-test (N=28)**

Self-efficacy variable	Pre	Post
High self-efficacy >3	21	28
Low self-efficacy $\leq 3$	7	0

Diabetes Symptoms Checklist-Revised (DSC-R) scale was used to assess diabetes symptoms and the severity of symptoms during the past month. In addition to the standard 34 traditional symptoms, participants reported other symptoms on the three open ended items. Two participants reported pre- test other symptoms as “shooting pain in foot” and “corns between toes” and two participants reported post- test other symptoms as “blurred vision” and “burning on top of feet.” The scoring of the scale was based on the 34 written items. The Wilcoxon Signed Rank Test was used to determine whether the difference between the pre-and post-test mean scores were statistically significant. Responsiveness was evaluated by comparing changes in DSC-R scores from pre-test to post-test. This significant finding demonstrates fewer symptoms experienced after participating in the intervention (Table 16).

**Table 16. Differences in the Scores of the DSC-R Scale from Pre- to Post-test**

	Pre n = 28 Mean (SD)	Post n = 28 Mean (SD)	z	p value
	1.02(.817)	.648(.544)	-2.443	.015

Standard deviation (SD)

Wilcoxon Signed Ranks Test Comparison of Participants' from Pre- to Posttest Scores on the Diabetes Symptom Checklist (DSC-R) Scale

	n	Mean Rank	Sum of Ranks
postDSCR_tot divided by total items-	16	14.72	235.50
preDSCR_tot divided by total items	8	8.06	64.50
missing value	3		
	1		
Total	28		

The DSC-R eight subscales were analyzed for differences pre and post intervention: (1) psychology, fatigue, (2) psychology, cognitive, (3) neurology, pain, (4) neurology, sensory, (5) cardiology, (6) ophthalmology, (7) hypoglycemia, and (8) hyperglycemia. There were statistically significant changes in DSC-R scores for the participants from baseline to end of study in fewer psychology fatigue symptoms, fewer neurology pain symptoms, fewer neurology sensory symptoms, fewer cardiology symptoms, and fewer ophthalmology symptoms (Table 17).

**Table 17. Differences in the Scores of the DSC-R Subscales from Pre- to Post-test**

Symptom Management Variables	Pre-Mean(SD)	Post-Mean(SD)	z	p Value
Psychology, fatigue	.68(.372)	.44(.389)	-2.953	.003
Psychology, cognitive	.45(.448)	.34(.328)	-1.546	.122
Neurology, pain	.45(.458)	.27(.288)	-2.091	.037
Neurology, sensory	.53(.416)	.31(.296)	-2.855	.004
Cardiology	.42(.441)	.17(.226)	-2.463	.014
Ophthalmology	.45(.431)	.24(.295)	-2.286	.022
Hypoglycemia	.38(.460)	.27(.385)	-1.592	.111
Hyperglycemia	.51(.428)	.43(.359)	-.885	.376

Standard Deviation (SD)

*Hypothesis 2.* After receiving a 6-week faith-based intervention, participants will show significant improvement from pre to post intervention in the outcome of diabetes self-management (diet, physical activity, diet, glucose monitoring, and daily self-foot checks).

The Summary of Diabetes Self-Care Activity scale (Table 18) reports the total summed scores from pre-test to post-test for diet, physical activity, glucose monitoring, and daily self-foot checks. There were statistically significant changes noted for self-care practices. Thus, participants significantly improved their self-management of diabetes after participation in the intervention.

**Table 18. Differences in the Scores of the SDSCA Scale from Pre- to Post-test**

	Pre N = 28 Mean (SD)	Post N = 28 Mean (SD)	z	p Value
	33.64(10.97)	44.86(11.25)	-3.546	<.001

Standard deviation (SD)

Wilcoxon Signed Ranks Test Comparison of Participants' from Pre- to Posttest  
Summary of Diabetes Self-Care Activities (SDSCA) Scale Scores

		N	Mean Rank	Sum of Ranks
postSDSA_tot - preSDSA_tot	Negative Ranks	6	6.92	41.50
	Positive Ranks	21	16.02	336.50
	Ties	1		
	Total	28		

The total summed scores of each subscale items were analyzed with significant improvements noted in healthy eating, physical activity, and self-foot checks (Table 19).

**Table 19. Wilcoxon Signed Ranks Test SDSCA Total Subscale Score Items**

Scale Variables	Pre- Mean(SD)	Post- Mean (SD)	z	p value
<b>Diet</b>	15.11(4.78)	18.93(3.85)	-3.363	.001*
<b>Exercise</b>	4.57(4.15)	7.21(3.91)	-2.681	.007*
<b>Blood Sugar</b>	6.18(5.07)	8.12(5.07)	-1.806	.071
<b>Foot Care</b>	6.07(5.40)	8.89(5.05)	-2.212	.027*

Standard deviation (SD) \*p&lt;.05

Table 20 displays the individual scores of each item of the SDSCA scale and the changes noted from baseline to program completion (Table 20).

**Table 20. SDSCA Scale Items from Pre to Post –Test**

<i>Scale Variables</i>	Pre-Mean(SD)	Post-Mean (SD)
<b>Diet</b>		
How many of the last SEVEN DAYS have you followed healthful eating Plan?	4.04(1.88)	5.39(1.45)
On average, over the last month, how many DAYS PER Week have you followed your eating plan?	3.36(2.25)	5.25(1.35)
On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?	5.07(1.82)	5.64(1.31)
On how many of the last SEVEN DAYS did you eat high-fat foods, such as red meat or full-fat dairy products?	2.64(1.79)	2.64(1.90)
<b>Exercise</b>		
On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity?	2.61(2.28)	3.75(2.10)
On how many of the last SEVEN DAYs did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do	1.96(2.20)	3.46(2.06)

around the house or as part of your work?

**Blood Sugar**

On how many of the last SEVEN DAYs did you test your blood sugar? 3.61(2.83) 4.39(2.69)

On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health-care provider? 2.57(2.80) 3.71(2.96)

**Foot Care**

On how many of the last SEVEN DAYS did you check your feet? 3.75(3.22) 5.04(2.42)

On how many of the last SEVEN DAYS did you inspect the inside of your shoes? 2.32(2.89) 3.86(3.08)

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*Summary*

This chapter provided a description for the sample participants, and results of the hypothesis testing for the impact of the 6-week intervention. Overall, participation in the self-management diabetes program had positive effects on improvements in diabetes knowledge, self-efficacy, symptom management, and diabetes self-management activities for these African American participants. In addition, improvements were identified for specific areas of knowledge, efficacy and self-care activities.

## **CHAPTER V**

### **DISCUSSION**

Participation in a faith-based self-management program increased knowledge about diabetes and diabetes self-management practices, improved lifestyle behaviors, and increased knowledge about symptoms management as hypothesized in the Diabetes Self-Management Model (Figure 2). This chapter presents the discussion and interpretation of the findings of the study. Study limitations, application of the Social Cognitive Theory (SCT), application to nursing practice, and research implications are presented.

#### *Interpretation and Discussion of Findings*

Findings indicated that participation in the diabetes self-management program showed significant changes across the diabetes self-management components. There were significant improvements in the diabetes knowledge, self-efficacy, and diabetes symptoms management, and diabetes self-care activities for the participants who participated in the intervention.

Diabetes knowledge is an important factor affecting diabetes care. It has been shown that persons with low literacy may have difficulty understanding and applying health information (Wolff et al., 2009). Adherence to the recommended self-care treatments is critical for the management of diabetes and for the prevention of diabetes related complications such as retinopathy, kidney failure, and amputations. Knowledge alone does not guarantee changes in behaviors, but it is needed to successfully self-



manage the disease. Previous studies have shown that designing culturally tailored diabetes self-management education in faith-based settings showed improvements in diabetes knowledge (Lorig et al., 2009; Samuel-Hodge et al., 2009; Walker et al., 2010; Williams et al., 2014).

Self-efficacy is an essential part of diabetes self-management; because it can impact self-care activities positively or negatively. Self-efficacy is having the confidence to carry out tasks (Bandura, 1977). Diabetes self-management requires daily decision making and self-management behaviors throughout the patient's lifetime, thus, an adequate level of diabetes management self-efficacy is needed. Interactive learning and active engagement were used in this program aimed at improving self-efficacy among participants. Interactive learning and active engagement included group discussions and the sharing of information and experiences. Participation in this program was positively related to changes in participants' self-efficacy. Participants' scores indicated high self-efficacy levels from baseline to completion of study. Studies have found that including interactive activities and actively engaging participants in diabetes self-management interventions can improve self-efficacy (Steinhardt et al., 2009; Peek et al., 2012; Williams et al., 2014). Also, being in an intervention group can have positive effects on diabetes management (Olson, & McAuley, 2015).

It is important for people with diabetes to recognize signs and symptoms of diabetes, particularly, hypoglycemia and hyperglycemia. It is also important for people with diabetes to know how to treat hypoglycemia. Integrating activities to increase knowledge about symptoms and symptoms management may help reduce the

unnecessary use of health care resources. In this study there were improvements in symptoms management with respect to decreased symptoms and decreased severity of symptoms from baseline to study completion. Also, there were improvements with respect to decreased symptoms of hypoglycemia and hyperglycemia, but the findings were not statistically significant. In this study, participants were able to recognize and identify signs and symptoms of hypoglycemia and hyperglycemia and know the treatments for hypoglycemia through repetitious writing. This was an in-class assignment and participants were given paper and pencil to write the signs and symptoms of hypoglycemia and hyperglycemia and the treatments for hypoglycemia repeatedly until it became permanently stored. This strategy promoted active learning and reinforced diabetes knowledge acquisition and maintenance. Prior research was limited with respect to integrating activities to promote diabetes knowledge about symptoms and symptoms management, indicating that more studies are needed in this content area of diabetes care and management (Lorig et al., 2009; Peek et al., 2012). Diabetes knowledge, self-efficacy, and symptoms management are prerequisites to performing adequate diabetes self-care activities.

Participants showed significant improvements from pre- to post- intervention in the outcomes of diabetes self-management, measured in this study as specific self-care activities. There were significant improvements in behaviors for diet, physical activity, glucose monitoring, and self-foot checks. There were significant changes in overall diabetes self-care activities.

Diet and exercise are essential elements to slowing or preventing diabetes complications (CDC, 2011). Healthy eating is an important component of diabetes self-management, thus choosing the correct foods to eat is critical. In this study, participants had to plan and implement healthy meals, record in a diet journal, and return to share their struggles and/or successes with meal planning. The objective for this assignment was to improve self-management behavior and meal planning. The findings from this study revealed significant improvements in healthy eating.

Physical activity is an important component of diabetes self-management, therefore, being physically active can have positive effects on diabetes outcomes. Before content was discussed in this area, participants were informed to consult with their health care providers before beginning an exercise program. The take home assignment for this session was to participate in physical activity for one week and record the duration and frequency of the activity on a calendar. Participants returned the following week and shared their successes and/or struggles with physical activity with the group. The objective for this assignment was to improve physical activity and goal setting. The findings from this study revealed significant improvements in the area of physical activities for these study participants.

Diet and exercise, in addition to glucose monitoring are essential to self-care management for persons with diabetes. Poorly controlled blood sugar levels can have negative effects on diabetes self-management (CDC, 2011). For some, glucose monitoring is invasive and burdensome and involves the pricking of a finger as recommend by health care professionals. In this study, participants were given glucose

logs to record one fasting and one post meal reading for one week and return with results for group discussion. This assignment was given to help participants understand the importance of monitoring blood sugars, and the importance of recognizing what healthy and unhealthy blood sugar values are. The objective for this assignment was to improve diabetes knowledge and symptoms management. The findings in this study showed improvements in glucose monitoring. Prolonged untreated elevated blood sugar values can lead to diabetes related complications (CDC, 2011). Thus, understanding complications of diabetes and what causes these may prevent the onset of diabetes complications. In this study, content was covered about diabetes complications, but there was not an assignment tied to this content. Finding in this study revealed significant improvements in self-foot checks.

These findings were consistent with other self-management studies with African Americans where the programs were successful and findings were statistically significant for changes in healthy eating, physical activity, and glucose monitoring (Collins-McNeil et al., 2012; Lynch et al., 2014; Peek et al., 2012; Steinhardt et al., 2009). This short duration intervention study showed impact and may be more practical and realistic to reach this underserved population in the community in comparison to the previous studies, and may be considered as a potential guide for future diabetes self-management program duration. However, replication of this study is needed given the small sample size.

### *Program Acceptability*

Statistically significant differences from pre to post-intervention across the diabetes self-management components supported the acceptability of the intervention for participants who enrolled in the study. Findings to support improvement from pre- to post- intervention in the diabetes knowledge, self-efficacy, and diabetes symptoms management were significant. Findings support improvement from pre- to post-intervention in the outcome of diabetes self-management care (physical activity, diet, glucose monitoring, medication, and daily self-foot checks) were significant. Didactic sessions addressed major topics relevant for all persons with diabetes that focused on diabetes self-management education (DSME), which is the cornerstone to living with diabetes successfully. The participant retention rate was high at 88%.

Community involvement played an essential role in the success and completion of this study and the literature confirms and supports the effectiveness of community-based approaches (Collins-McNeil et al., 2012; Gutierrez et al., 2014; Samuel-Hodge et al., 2009). The methods implemented were culturally appropriate: all the participants enrolled in the study were African Americans and the educational content was delivered by an African American. Studies have shown that race concordance can affect the patient's adoption of lifestyle recommendations (Traylor, Schmittiel, Uratsu, Mangione, & Subramanian, 2010).

Because spirituality is rooted within the culture of African Americans, the sessions were held at two community black churches in order to nurture the spiritual and practical health needs of the participants. Each educational session began with a scripture

verse. The scripture verses were selected intentionally to relate with each topic –*nutrition* (1 Corinthians 6:19 “know ye not that your body is the temple of the Holy Ghost which is in you”). This scripture was directed at participants emphasizing the importance of healthy eating. The church leaders were supportive of the program, which demonstrated their commitment and support for the spiritual and health needs of their congregation. The African American church is an appropriate conduit for diabetes self-management care and health promotion interventions. Pastors, are gatekeepers for access to their members, and their support of a project is essential in the development of a trusting and working relationship among members and with communities. Providing self-management interventions on Sundays allows the researcher(s) to reach a broader sample, and allows participants to acquire formal diabetes education that is accessible and free. This will contribute to Healthy People 2020 objective D-14, which is to increase the proportion of persons with diabetes who received diabetes self-management education (Healthy People 2020, 2011). Therefore, the church is an excellent setting for the delivery of diabetes self-management education and other health promotion activities that are free to African Americans who could not otherwise access these programs.

This faith-based culturally tailored diabetes self-management intervention was feasible and effective in that participants showed statistically significant improved changes in diabetes knowledge, self-efficacy, symptoms management, and self-care activities. The findings from this study indicated the importance of designing culturally tailored interventions to reach this underserved population. Implementing a culturally tailored program addressing cultural values, while taking into account health care access,

and social and financial barriers can improve diabetes performance measures (McCleary-Jones, 2011; Ricci-Cabello et al., 2013; & Steinhardt, et al. 2015.).

### *Social Cognitive Theory*

The Social Cognitive Theory (SCT) was the conceptual framework that guided this study. Within this study the diabetes self-management intervention was conceptualized as the foundation that supported the development of improved diabetes knowledge, self-efficacy, symptoms management, and self-care activities. There are two main components of the self-efficacy theory: self-efficacy expectations and outcome expectations. In this study the facilitator planned activities and linked each activity to an outcome expectation variable. This strategy was used to improve participants' diabetes knowledge, self-efficacy, symptoms management, and self-care activities. The focus of this intervention was to provide diabetes self-management education using interactive engagement and active learning.

In this study, participants were given homework assignments that were centered on diabetes self-management activities. The first activity was a group discussion where participants shared their feelings about the diagnosis of diabetes. This activity was linked to the physiological and emotional outcome expectation variable. The goal for this activity was to foster peer support and increase self-efficacy. The second assignment was meal planning. Meal planning was linked to the social persuasion variable. Choosing healthier meals and sharing meal planning ideas increased self-efficacy. The third assignment was to increase physical activity. This activity was linked to the vicarious experiences outcome variable. Motivating participants by hearing others participate

increased self-efficacy. The fourth assignment was to monitor glucose levels. This assignment was also linked to the vicarious experiences variable, as previously stated hearing others participate increased self-efficacy. The final assignment which was an in-class activity involved memorization through repetitive writing. This activity was linked to the mastery outcome expectation variable. Mastering through repetition was the goal for this activity. Increasing diabetes knowledge of symptoms and symptoms management increased self-efficacy.

The key constructs, person, behavior, and environment (the church) of the SCT, were apparent in this study and the diabetes self-management variables demonstrated significant improvements in outcome behaviors from pre- to post-intervention. Self-efficacy expectations were positively and significantly correlated with the outcome expectations variables used in this study intervention. The SCT has been used successfully to predict outcome behaviors and was an appropriate theory for guiding this intervention study (McCleary-Jones, 2011; Peek et al., 2012; Spencer et al., 2011; Williams et al., 2014). This study was supported by the Social Cognitive Theory.

#### *Limitations of the Study*

There were several limitations noted in this study. First, the small non-randomized sample was not representative of the population and may have demonstrated a lack of significant findings due to a lack of power. Second, lack of a control group makes it difficult to compare the effects of the intervention. Additionally, the Hawthorne effect may have been functioning during the intervention, thus introducing threats to external validity. The major threats were social desirability and persons knowing they



were in the intervention group. Data were based on self-reported information that may have been not fully accurate. The study was conducted in two churches which may not be reflective of the general population of African Americans in the southeast United States. Finally, the study was limited to one culture, affecting generalizability.

### *Implications for Nursing*

Diabetes continues to be a public burden on the economy and a huge burden to individuals. Providing appropriate and effective diabetes self-management education (DSME) is essential in preventing and reducing diabetes related complications, thus leading to a healthier life for those affected by the disease and fewer health care costs. Therefore, the first implication resulting from this study is that culture must be considered when designing self-management programs. Becoming culturally competent can help in the design of creative and innovative diabetes self-management programs. Understanding an individual's culture may be the first step toward delivering relevant and effective diabetes self-management education.

The importance of collaborating and partnering with community agencies is the second implication derived from this study. This is important to consider because collaborating with community agencies and faith-based institutions to develop and implement diabetes self-management programs that are culturally tailored, may reduce the unnecessary use of health care resources, reduce diabetes disparities, and improve quality of life for those living with this disease.

With diabetes rates steadily rising, a need for designing and implementing randomized controlled experimental studies using control groups and comparisons groups

to evaluate efficacy of faith-based diabetes self-management programs is the third implication derived from this study. The literature review revealed that the majority of the studies examining culturally tailored diabetes self-management programs in community-based settings were quasi experimental. Thus, more robust experimental studies examining culturally tailored diabetes self-management programs are needed.

The fourth implication derived from this study, is the need to develop and implement culturally tailored faith-based self-management programs using the Coaching Model and to train Community Health Workers (CHW) to provide diabetes self-management. This may have compelling effects on diabetes self-care practices and diabetes disparities, because CHWs have an intimate relationship with their community and are well received. Lastly, this program was easily accessible and free to the congregation because the educational sessions were provided on site. Therefore, more community-based diabetes self-management programs that are accessible and free for persons who could not otherwise access these programs are needed to begin to address the inequities associated with diabetes for African Americans. Diabetes self-management education (DSME) is essential for diabetes self-care. Therefore, designing creative, effective, and innovative strategies is important when delivering diabetes self-management interventions in this underserved population.

#### *Implications for DSME Interventions and Programs*

The study findings provided some useful data for clinicians with respect to self-management education. The review of the literature in addition to findings from this study supported diabetes knowledge as the basis for diabetes self-management education.

Although this study had a shorter duration compared to other studies in the literature (Collins-McNeil et al., 2012, Samuel-Hodge et al., 2009; Williams et al., 2014), this six-week intervention showed impact and may be more practical and realistic to reach the majority of diabetics in the community. A shorter culturally tailored intervention may be especially important for vulnerable groups such as ethnic and racial minorities, those with lower education, blue collar workers who cannot take off work multiple times to attend programs, and low income or uninsured persons who cannot afford the formal programs offered through health systems and hospitals.

These study findings have important implications for Accountable Care Organizations (ACOs) and Patient Care Medical Homes (PCMHs) to improve quality and patient centered care as well as to decrease unexpected hospitalizations, readmissions, and emergency department (ED) visits for diabetics. This type of brief but efficacious intervention has the potential to improve patient satisfaction and allay cost concerns with diabetic Medicare recipients. Though this intervention was provided by a health professional, it is possible that this intervention could be led by trained lay persons or Community Health Workers (CHWs). In addition, the shorter intervention may be more adaptable and acceptable in settings such as schools, work places, or community centers. Culturally tailoring to the population and locale would be important to consider and include.

#### *Recommendations for Future Research*

Programs for diabetes self-management that are culturally tailored are practical. Thus, more studies delivering community-based diabetes interventions are needed to

accommodate the large population of African Americans living with diabetes. Although diabetes community-based programs have been implemented over the years, the diabetes disparity continues to exist and the incidence and prevalence of diabetes continues to increase. There needs to be a better understanding of African American cultures and learning styles in diabetes self-management programs, so that programs can modify teaching strategies and procedures in order to tailor them to meet unique needs of groups. Another area of future research is the concern about the duration and length for diabetes self-management programs. This study was six-weekly 1 hour sessions which were shorter in individual length and in duration over time in comparison to other self-management programs, but demonstrated statistically significant findings across the diabetes self-management outcome components. Currently, there are no evidence-based guidelines that recommends the duration and length for self-management programs. Experimental studies with larger samples are needed to establish cause and effect related to diabetes self-management programs and diabetes related outcomes.

Research is needed to examine the participation in the different areas of diabetes self-management education. This study focused on the overall participation in the self-management program. More diabetes self-management studies are needed so that an adequate representation of African Americans can be targeted, recruited, and retained in the study. In particular, African American males are needed in research studies related to diabetes self-management programs. This study showed positive correlations between self-efficacy and self-management practices, therefore, more research is needed in this area, because high levels of self-efficacy are needed to perform diabetes self-care

activities to manage the disease and produce positive diabetes outcomes. Studies conducted in faith-based settings have demonstrated significant positive healthier lifestyle findings; thus more studies are needed examining the effectiveness of faith-based interventions. Research studies related to diabetes and hypoglycemia symptoms and of symptom management are needed, because studies examining these areas are limited.

### *Summary*

Designing a culturally tailored intervention that is creative and innovative may result in improved outcome for African American adults with type 2 diabetes. In order to reduce this disparity and epidemic, consideration for health beliefs, nutritional practices, religious beliefs and educational status must be considered in intervention design and testing. This study demonstrated statistically significant changes in healthy eating, exercise, symptoms and symptoms management, and self-efficacy for the African American participants. Also, there were significant findings related to the association between self-efficacy and self-efficacy outcome expectations, thus supporting the Social Cognitive Conceptual Theory framework that was used to guide this study.

This was a pilot study of a faith-based culturally tailored DSME intervention for African American adults with type 2 diabetes. The findings indicated that interventions focused on diabetes knowledge, symptom management, self-efficacy, and diabetes self-care activities can be implemented in the community and can lead to improvements in diabetes self-care and improvements in overall quality of life.

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## APPENDIX A

### CONSENT FORM

Project Title: The Effect of a Diabetes Self-Management Program for African Americans in a Faith-Based Setting: Pilot Study

Principal Investigator and Faculty Advisor (if applicable): Pandora Goode (PI) and Robin Bartlett (advisor)

Participant's Name: \_\_\_\_\_

#### **What is the study about?**

This is a research project. Your participation is voluntary and you may end your participation at any time, and refusing to participate or leaving the study at a later time will not result in any penalty.

The purpose of this pilot study is to implement a culturally tailored faith-based diabetes self-management educational project. The aim of this study is to provide diabetes self-management education, to improve diabetes knowledge, confidence, symptom management, and diabetes self-management care among African Americans.

#### **Why are you asking me?**

The study population will include African American patients with a primary diagnosis of Type 2 Diabetes (T2D) disorder (self-report) or been told by a healthcare professional you have diabetes. The study will be a convenience **and snowball sample**. It will be limited to African American males and females  $\geq 18$  years or older. You must be able to speak and read English and able to complete the questionnaires. Exclusion criteria includes diabetes as a secondary diagnosis, patients with type I diabetes, have participated in diabetes self-management program in the past year, pregnant women, and diabetes complications that would impede responses to questionnaires.

#### **What will you ask me to do if I agree to be in the study?**

If you choose to participate in this study, you will be asked to complete questionnaires. The questionnaires asked questions about eating habits, physical activity, self-confidence, blood sugar monitoring, diabetes symptoms, and diabetes knowledge. The questionnaires will take 60 minutes or longer depending on the participants individual needs to complete. Also, hemoglobin A1C levels and anthropometric measurements will be obtained. Anthropometric measures means the measurement of the human body. The body mass index (BMI) will be obtained. The BMI is calculated by taking the weight in kilograms and dividing it by the height. The BMI is a measurement of body fat. The hemoglobin A1C level will be obtained by the pricking of a finger by the PI from all participants. Your height will be obtained without shoes to the nearest 0.1 cm with a stadiometer. The stadiometer is a piece of equipment used to measure human height. Body weight will be obtained on an electronic weight scale. BMI will be calculated by

dividing body weight (in kilograms) by the square of height (in meters). You will also be asked to participate in six weeks of group diabetes education sessions once a week led by the Principal Investigator. Each educational session will last 1 hour. At the completion of the study you will be asked to complete a set of questionnaires for pre- and post-comparison. It will take about 9 hours total to complete the study activities and meetings.

**Is there any audio/video recording?**

No.

**What are the risks to me?**

“The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants.” The participants will be informed that the PI anticipate minimum risks such as discomfort from finger stick and potential injuries from performing physical activity in this research study. Instructions on how to prevent potential injuries from performing physical activities will be provided at the intervention session meeting. Also, new information might cause minor discomfort. The Principal Investigator will be available to answer any questions. If any of the questions make you feel uncomfortable, you may choose not to respond. Please note weight and height will be self-reported by you away from other group members. If you have questions, want more information or have suggestions, please contact Pandora Goode who may be reached at 336-337-5658 or by email at prgoode@uncg.edu or my faculty Advisor Robin Bartlett, who may be reached by email at robin bartlett @uncg.edu. If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Integrity at UNCG toll-free at (855)-251-2351.

**Are there any benefits to society as a result of me taking part in this research?**

An increased knowledge of diabetes management may minimize health care costs among African Americans through diabetes education.

**Are there any benefits to me for taking part in this research study?**

An increased knowledge of diabetes self-management and symptom management might positively impact the quality of the self-care management of the disease.

**Will I get paid for being in the study? Will it cost me anything?**

“There is no costs to you, but you will receive \$30.00 dollar Walmart gift card over 6 weeks for your time and inconvenience” if you complete the study. The table below shows what you will receive and when you will receive it.

What:	Who	When:	What you will do:	What you will receive:
Recruitment	You	At the enrollment session	1. Complete consent/ Diabetes Self-	

			<p>Care Activities (SDSCA) questionnaire and the Diabetes Participant Questionnaire</p> <p>2. The Diabetes Symptom Checklist Revised (DSC-R)</p> <p>3. The Spoken Low Literacy in Diabetes scale</p> <p>4. The Diabetes Empowerment Short Form scale (DES-SF)</p>	
1 <sup>st</sup> meeting, diabetes education	You	At the end of the educational session.	Diabetes in African Americans: prevalence, signs and symptoms	You: \$5 Walmart gift card and a calendar
2 <sup>nd</sup> meeting, diabetes education	You	At the end of the educational session.	Diet	You: Diet diary
3 <sup>rd</sup> meeting, diabetes education	You	At the end of the educational session.	Being Active	You: \$10 Walmart gift card, pedometer
4 <sup>th</sup> meeting, diabetes education	You	At the end of the educational session.	Medications	You: Glucose log
5 <sup>th</sup> meeting,	You	At the end of the educational	Glucose Monitoring and Diabetes	You: Diabetes recipe book

diabetes education		session.	Complications	
6 <sup>th</sup> meeting, diabetes education	You	At the end of the educational session.	Symptom Management	You: Silicone wristband with T2D engraved
Post data collection	You	At the end of the six week educational sessions	1. Complete Diabetes Self-Care Activities (SDSCA) questionnaire. 2. The Diabetes Symptom Checklist Revised (DSC-R). 3. The Spoken Low Literacy in Diabetes (SKILLD) scale 4. The Diabetes Empowerment Short Form scale (DES-SF)	You: \$15.00 Walmart gift card

**How will you keep my information confidential?**

"All information obtained in this study is strictly confidential unless disclosure is required by law." The data will be collected in person and confidentially. Data will be stored electronically on a password protected home computer. The hardcopy will be stored in a file cabinet locked in my office at home. For this study a master list will be used and each participant will be assign a study number. The master list will be separate from the data and will be kept locked in my file cabinet in my home. The questionnaires will be shredded at the conclusion of the study.

**What if I want to leave the study?**

"You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. If you choose to withdraw, you may request that any of your data which has been collected be destroyed unless it is in a de-identifiable state." Also, the PI has the right to stop your participant at any time.

**What about new information/changes in the study?**

"If significant new information relating to the study becomes available which may relate to your willingness to continue to participate, this information will be provided to you."

**Voluntary Consent by Participant:**

By signing this consent form you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are 18 years of age or older and are agreeing to participate in this study described to you by Pandora Goode.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

APPENDIX B  
SUPPORT LETTERS

Dear Sir/Madam

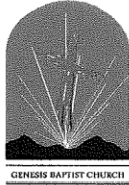
This letter is to confirm Sharpe Road Church of Christ have reviewed and strongly support Pandora's Goode research pilot study entitled;

"Effects of a Diabetes Self-Management Program for African American Adults with Diabetes in a Faith-Based setting: A Pilot Study"

We are aware that her study will involve diabetes education with group sessions. Also, the study 'involves' data collection with pre and post completion of questionnaires and obtaining A1C levels. Sharpe Road Church of Christ is interested in her efforts that will improve diabetic patient's outcomes and we anxiously await her reports.

If you have any questions are need further assistance, do not hesitate to contact me.

Sincerely,



**GENESIS BAPTIST CHURCH**

**2812 East Bessemer Avenue**

**Greensboro, NC 27405**

**(336) 379-1133**

[www.genesisbaptistchurch.org](http://www.genesisbaptistchurch.org)

October 13, 2015

Institutional Review Board  
School of Nursing  
University of North Carolina-Greensboro

Dear Sir/Madam

This letter is to confirm Genesis Baptist Church have reviewed and strongly support Pandora's Goode research pilot study entitled:

"Effects of a Diabetes Self-Management Program for African American Adults with Diabetes in a Faith-Based setting: A Pilot Study"

We are aware that her study will involve diabetes education with group sessions. Also, the study involves data collection with pre and post completion of questionnaires and obtaining A1C levels. Genesis Baptist Church is interested in her efforts that will improve diabetic patient's outcomes and we anxiously await her reports.

If you have any questions or need further assistance, do not hesitate to contact me.

Sincerely,

Reverend Gregory T. Headen , D.Min  
Senior Pastor







APPENDIX D  
CHURCH FLYER

# Would you like to Participate in a Research Study about Diabetes Self- Management in People with Type 2 Diabetes?



What does it entail? Your participation would consist of answering several questionnaires about diabetes self-management and you will also be asked to attend 6 weeks of educational sessions (1 hour per week). Also, weight, height, BMI, and your finger pricked for A1C value. Each participants will receive 30.00Walmart gift card over the 6 weeks period. The classes will take place at Genesis Baptist Church.



What is the purpose? The purpose of the project is to improve healthy eating, and physical activity, diabetes self-management skills, symptoms management, and diabetes knowledge for diabetes in African American residents.



You may participate if you are: African American, between 18 years old or older, with Type 2 diabetes, or have been told by a health professional you have diabetes, able to read and write English and able to complete surveys.

Principal Investigator: Pandora Goode, Nursing PhD student The University of North Carolina, Greensboro, Contact Telephone: (336)337-5658.

Location: Genesis Baptist Church 2812 E Bessemer Ave, Greensboro, NC, 27405