AN ANALYSIS OF THE INFLUENCE OF EDUCATION PROGRAMMING TYPE, SCOPE OF DIABETES SELF-MANAGEMENT EDUCATION, AND SELECTED DEMOGRAPHICS ON SELF-EFFICACY AMONG ADULT AFRICAN AMERICANS WITH TYPE 2 DIABETES

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Diabetes mellitus significantly affects the health status of adults living in the United States. This is true particularly of African Americans who are disproportionately affected by this devastating chronic condition. As such, the purpose of this study was to analyze the type of education programming and the scope of diabetes self-management education (DSME) received, on the self-efficacy of adults diagnosed with type 2 diabetes. Conducted among adults, particularly African Americans diagnosed with diabetes, this comparative analysis examined the influence of programming on self-efficacy among subjects who participated in educational enrichment provided by faith-based organizations (FBO) and their counterparts who received DSME in clinical care settings only.

The Independent Sample T-test, Multiple Regression, and Pearson’s Correlation were the statistical tests used to analyze data. Findings revealed a statistically significant difference in diabetes self-management education (DSME), including diet, physical activity, and glucose monitoring between the two groups. Further, age, income, and participation in an FBO program explained 33% of the variance in the final regression model. Finally, data analyses revealed that there was a positive relationship (Pearson’s correlation statistic \( r = 0.26 \)) between diabetes self-management education and
self-efficacy. Although analyses suggested participating in FBO programming did not influence self-efficacy, it was confirmed that subjects who participated in such enrichment did receive additional DSME. Based on these findings, it is recommended that medical providers, health educators, and public health professionals collaborate with the faith community to plan, implement and evaluate educational interventions to enhance self-efficacy through DSME.
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CHAPTER I

INTRODUCTION

Diabetes Mellitus

Consistent with research conducted by the American Diabetes Association (ADA) diabetes mellitus consists of a group of chronic diseases in which blood glucose levels among affected individuals fall higher than within the normal range (ADA, 2015a). Levels of glucose (commonly referred to as sugar) in the bloodstream increase when the body has a deficiency of insulin, a decreased ability to use insulin, or when both circumstances occur simultaneously Centers for Disease Control and Prevention (CDC, 2015a). Insulin is a hormone produced in the pancreas that allows glucose to be transported in the bloodstream and delivered to all the body’s cells where it is converted to and used for energy.

The American Diabetes Association (2015a) has identified distinctions between two categories of normal blood glucose levels. Before eating meals, glucose measurements that are observed to fall between 70 and 130 mg/dl represent normal levels. In addition, two hours after eating a meal, normal blood glucose levels are found among persons having less than 180 mg/dl (ADA, 2015a) in their bloodstreams.

The Centers for Disease Control and Prevention (2011c) has described abnormal blood glucose levels among three categories of persons with diabetes: Gestational, type 1, and type 2 (CDC, 2011c).

- Gestational diabetes is recognized as a disease condition demonstrated only among pregnant women. Left untreated, this type of diabetes can lead to
health complications for mothers and their babies (CDC, 2010a). Gestational diabetes requires treatment to bring maternal blood glucose levels within normal range. In general, between 2% and 10% of all pregnant women are affected by gestational diabetes. Increasingly, gestational diabetes occurs among minority populations including African American, Hispanic/Latino, and Native American women more often than their White counterparts (CDC, 2015a). Being overweight or obese increases pregnant women’s susceptibility to have this form of diabetes. This specific diabetes condition is exhibited more commonly among individuals who have a family history of type 2 diabetes. Chances of being diagnosed with gestational diabetes in subsequent pregnancies are increased if a woman had this condition from a prior pregnancy (United States Department of Health and Human Services National Institute of Diabetes and Digestive and Kidney Diseases [NIDDKD], 2014). Typically, gestational diabetes disappears when the pregnancy has ended. Importantly, however, women who develop gestational diabetes have a 35% to 60% chance of developing another type of diabetes within the next 10 to 20 years of life (CDC, 2011c).

- Type 1 diabetes is a chronic condition referred to as insulin-dependent diabetes mellitus (IDDM) or as juvenile-onset diabetes. Typically, this condition is diagnosed among children and young adults. Importantly however, it can occur at any age. Type 1 diabetes is an autoimmune disease that can be caused by genetic, environmental, or other factors. Although there
is no known way to prevent type 1 diabetes, the most recognized and effective treatment for the condition includes the requisite use of insulin. This form of diabetes accounts for approximately 5% of all diagnosed cases (ADA, 2015b; CDC, 2011c, 2015a).

- The most prevalent category of this chronic condition found among people living in the United States is type 2 diabetes. According to the Centers for Disease Control and Prevention (2015a), type 2 diabetes was known formerly as non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. This form of the chronic disease has been demonstrated to account for approximately 90% to 95% of all diagnosed cases of diabetes. Generally, type 2 diabetes is associated with risk factors including older age, obesity and physical inactivity, family history, and/or a personal history of gestational diabetes. Often type 2 diabetes can be controlled with diet and increased levels of physical activity, whereas in some cases insulin or oral medication is necessary to manage this disease and associated symptoms (CDC, 2011c, 2015a).

It is noteworthy that type 2 diabetes has been associated with a precursor identified as prediabetes. Prediabetes is a condition in which blood sugar levels are higher than normal, but not elevated sufficiently to constitute a diagnosis of type 2 diabetes. Individuals with a diagnosis of prediabetes are at a higher risk for developing type 2 diabetes than people determined not to have elevated blood levels associated with
this condition. Without changes in lifestyle risk factors, 15% to 30% of people diagnosed with prediabetes will develop type 2 diabetes within five years (CDC, 2015c).

**Modifiable and Non-Modifiable Risk Factors**

According to the CDC (2015a), specific risk factors have been linked to type 2 diabetes. These include both modifiable and non-modifiable factors. Modifiable risks factors include impaired glucose tolerance, prior history of gestational diabetes, and physical inactivity (CDC, 2015a).

In context of identified modifiable risk factors, abnormal blood glucose levels revealed during an oral glucose tolerance test are described as impaired glucose tolerance. Such, abnormal glucose levels can be controlled with lifestyle changes to prevent or manage diabetes. Exercising and making healthy food choices are examples of such lifestyle modifications. For example, maintaining a diet low in fat and eating smaller food portions are ways to achieve healthier eating. Engaging in such healthy lifestyle practices on a daily basis enables the body to use glucose without having to increase insulin levels in order to maintain normal blood glucose (ADA, 2015c; CDC, 2015a).

In addition to other identified risk factors, abnormal risk measurements of excess weight around the waist, elevated levels of triglycerides, blood pressure, fasting blood glucose, and decreased high density lipoprotein (HDL) levels are health conditions directly linked to type 2 diabetes. The combination of these health issues is referred to as metabolic syndrome (formerly known as Syndrome X; CDC, 2015c). As such, metabolic syndrome is described as the presence of any combination of any three of these
associated health conditions. If a person has one or more of these modifiable lifestyle risk factors, they are at increased risk for a range of additional or even multiple health conditions including diabetes (CDC, 2015c). The CDC (2015c) has reinforced this risk potential by documenting increased rates of type 2 diabetes among Americans with metabolic associated risks.

The American Diabetes Association also has indicated the necessity of a heightened awareness of the effect of fat levels in the bloodstream as associated risk factors to diabetes mellitus when addressing this chronic condition (ADA, 2014a). Cholesterol is a form of fat that is carried through the body in two kinds of bundles, or what is known as lipoproteins. In context of metabolic measurements of health related conditions for persons with type 2 diabetes, the United States Preventive Services Task Force (USPSTF, 2015) has described elevated levels of total cholesterol, low density lipoprotein (LDL-C) and triglyceride levels (TG), and deficiencies of high density lipoprotein (HDL-C) as abnormalities of lipoprotein metabolism. These disorders can be acquired or familial in nature (USPSTF, 2015).

High-density lipoproteins (HDL), or “good” cholesterol, helps remove cholesterol from the body. In general, the higher the HDL measurement the more likely it is that associated health risks will be minimized. Among men, cholesterol HDL blood levels observed above 40mg/dl are normal. Among their female counterparts normal cholesterol HDL levels are measured above 50mg/dl (ADA, 2014a).

Low-density lipoproteins (LDL), or “bad” cholesterol, can lead to a buildup of cholesterol in the arteries (ADA, 2014a). In general, the lower the LDL blood levels the
better it is with regard to minimizing a range of health risks. Normal levels of cholesterol LDL blood levels are measured below 100mg/dl.

Triglycerides are another kind of fat found in the blood. This form of fat increases risk for a heart attack or stroke if blood levels are elevated. Normal triglyceride measurements are those observed below 150mg/dl (ADA, 2014a).

Along with abnormal metabolic conditions, the ADA (2014b) has called attention to the significance of hypertension as an associated risk factor for type 2 diabetes. When blood circulates through the body’s vessels with too much force, the outcome is hypertension, commonly referred to as high blood pressure. When blood pressure is elevated, the heart must work harder and can increase the risks for heart disease and diabetes. Healthy blood pressure includes those measurements below 120/80mmHg among adults. In early stages, high blood pressure has been determined between 120/80mmHg and 139/89mmHg, whereas a definitive diagnosis of hypertension is observed at 140/90mmHg or higher for those with diabetes (ADA, 2014b; National Heart, Lung, and Blood Institute [NHLBI], 2014).

The American Diabetes Association has recommended healthy lifestyle options to prevent or delay the onset of diabetes. These options include eating healthy, participating in physical activity, and maintaining a healthy weight. In addition to other identified factors, being overweight increases the risk for being diagnosed with type 2 diabetes. Modifiable lifestyle risk factors of physical inactivity and unhealthy diets can lead to obesity. The combined effects of obesity and high blood pressure also have been determined to be linked to this chronic health condition. Obesity has been linked to such
complications associated with type 2 diabetes including unhealthy cholesterol, and increased blood glucose levels (ADA, 2015c). Notably, the United States Department of Health and Human Services (USDHHS, 2011) has confirmed that obesity is a critical risk factor associated among persons with diabetes living in the United States (USDHHS, 2011).

Importantly, childhood obesity affects children of racial and ethnic minorities at much higher rates than their non-Hispanic White counterparts. Notably, the majority of children and adolescents with type 2 diabetes also are represented among ethnic groups (Healthy People 2020 [HP 2020], 2015a). Further, obesity in childhood has been demonstrated to be associated with obesity in adulthood (CDC, 2015d). Losing weight can help prevent and manage problems occurring from diabetes (ADA, 2015c; CDC, 2015d).

For those at risk or who have been diagnosed with this health condition, the American Diabetes Association has identified the importance of the glycated hemoglobin (A1C) measurement for diabetes screening and management (ADA, 2015a). Hemoglobin is a protein found inside red blood cells. This protein binds to glucose circulating in the bloodstream. Excess glucose enters red blood cells and links (or glycates) with molecules of hemoglobin. In this way, the more glucose that is found circulating in the blood, the more hemoglobin becomes glycated. When diabetes is not controlled, excess glucose occurs in the blood. Consequently the A1C test is used to measure the percent of glycated hemoglobin in the blood. Measurement of A1C helps to
identify average blood glucose control over a 2 to 3 month period. A measurement observed to be 7% or lower is determined as within normal range (ADA, 2015a).

In addition to managing strategies for modifiable risk factors, the Centers for Disease Control and Prevention (2015a) has paid considerable attention to non-modifiable risk factors related to type 2 diabetes. These included older age (being greater than 45 years old), having a family history of the condition, and race/ethnicity. Researchers have documented the devastating effect of diabetes mellitus on the health and quality of life of many Americans.

**Incidence of Diabetes**

According to 2012 data published by the American Diabetes Association (ADA, 2015d), 29.1 million people (9.3% of the population) in the United States have been diagnosed with this condition. Another 1.7 million new cases of diabetes among people aged 20 years or older are diagnosed every year (ADA, 2015d). The total number of Americans aged 20 years or younger who have been diagnosed with this condition represents about 0.25% (208,000 people) or 1 in 400 who have been diagnosed with diabetes. By contrast, approximately 12.3% (28.9 million people) of those 20 and older have some form of this chronic condition. Among those adults aged 65 years or older living in the United States, 25.9% (11.8 million people) have diabetes (ADA, 2015d). As confirmed by these data, diabetes is more prevalent among older Americans. In context of these data, if current trends continue, approximately 1 of every 3 adult Americans will have diabetes by the year 2050 (CDC, 2011a).
When race, a non-modifiable risk factor associated with type 2 diabetes, is considered, African Americans, Hispanic/Latino Americans, Native Americans, and some Asian Americans and Pacific Islanders are at increased risk (CDC, 2011a, 2015a). In this context, research has demonstrated that adult Native Americans, Alaska Natives, Hispanic/Latinos, Asian/Pacific Islanders, and African Americans are twice as likely as their White adult counterparts to be diagnosed with type 2 diabetes (CDC, 2011a, 2015a).

Notably, management of abnormal glucose levels can exert a positive impact on the quality of life of persons living with type 2 diabetes. The American Diabetes Association (ADA, 2015a) has documented that maintaining levels close to normal can prevent or delay the progression of type 2 diabetes and the associated health complications. One such common self-management strategy is to engage in daily glucose monitoring. A glucose meter is the main tool that can be used in checking daily blood glucose levels when used properly. The meter is a small, portable machine that uses a drop of blood obtained from a finger prick usually made by an automated (spring loaded) lancing device to measure the blood glucose level. A blood drop is placed on a test strip, which is then inserted into the meter and displays the amount of glucose circulating in the bloodstream (ADA, 2015e). Similar meter types also are available that use a small blood sample from other less sensitive body areas comparable to the amount of blood obtained from a finger prick. Such body areas less sensitive than the finger include the upper arm, forearm, or thigh (United States Department of Health and Human Services National Institute of Diabetes and Digestive and Kidney Diseases [NIDDKD], 2013a). Importantly, obtaining blood samples from alternate sites, such as the forearm or
fleshy parts of the body, can result in different glucose readings. Consequently, there can be a delay between what occurs in the bloodstream and what is measured at the alternate sites when monitoring daily blood glucose levels. It is suggested that since blood glucose levels can change quickly depending upon the circumstance (e.g., meal, medication), it is better to use a finger stick blood sample for a more accurate glucose measurement (ADA, 2012). Daily glucose monitoring is a self-check for people to manage their diabetes. Also, this check is an indication of blood glucose levels at any one point in time (ADA, 2015d).

Given the numbers of Americans who have been diagnosed with this condition, it is no surprise that diabetes prevalence in the United States has resulted in significant burden on the healthcare delivery system. According to Healthy People 2020 (2015a), the national agenda documents the commitment to improving health of all Americans. The agenda noted particularly that health care costs associated with diabetes included medical care for individuals with this condition. Additional costs have been linked to care for associated disability management and the management of premature death outcomes. In this context, the American Diabetes Association (2015d) has documented that the approximate total costs associated with diabetes in the United States were approximately 245 billion dollars in 2012. Further, the average medical expenses among people diagnosed with diabetes were 2.3 times higher than those for their counterparts who were not diagnosed with this chronic condition (ADA, 2015d).
Health Complications

Importantly, serious health complications and consequences have been associated with this chronic disease. According to the Center for Disease Control and Prevention (CDC, 2015c), damage to vital organs can occur over time when diabetes is not managed well. Such outcomes result when glucose and fats are retained in the blood. In this context, consequences that can arise include chronic health conditions such as heart disease. In specific, research has confirmed that heart disease rates are increased more than 2 to 4 times as a complication of diabetes. Also, diabetes is the leading cause of kidney failure, adult-onset blindness, neuropathy, stroke, and lower limb amputations (ADA, 2015d; HP 2020, 2015a). These adverse health complications have significant negative effect on the quality of life among affected adult Americans including (ADA, 2015d):

- Among adults aged 20 years or older with self-reported diabetes, 71% had blood pressure greater than or equal to 140/90 mmHg, from the period 2009-2012.
- Diabetes was the leading cause of kidney failure and accounted for 44% of new cases in 2011.
- 4.2 million (28.5%) people with diabetes aged 40 years or older had diabetic retinopathy from 2005-2008.
- Stroke was noted on 16% of diabetes-related death certificates among people aged 65 years or older, in 2004.
- Approximately, 73,000 non-traumatic lower-limb amputations were performed among people with diabetes age 20 years and older, in 2010 (ADA, 2015d).

Importantly, prevalence of mortality events associated with diabetes are overwhelming in the United States. As documented by Centers for Disease Control and Prevention (2011a), diabetes was the seventh leading cause of death specified on American death certificates in 2007. According to Healthy People 2020, the impact of diabetes lowers life expectancy by as much as 15 years (2015a).

**The Disparity of Diabetes**

As mentioned previously, the presence of increased rates of diabetes mellitus are more predominant among minority populations in the United States. Any health outcome observed to a greater or lesser degree among different populations is described in Healthy People 2020 as a health disparity (2015b). In this context, this report defines a health disparity as “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage” (HP 2020, 2015b). Commonly, health disparities adversely affect populations who have progressively experienced greater barriers to attaining quality health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion (HP 2020, 2015b).

The disparity of diabetes mellitus targets minority populations (HP 2020, 2015a). In this context, minority groups constitute 25% of all adults diagnosed with diabetes in
the United States. Distinctively, on average, African American adults are 1.7 times more likely to have the disease than their non-Hispanic White counterparts of similar age. In addition, diabetes prevalence rates among Native Americans are 2 to 5 times higher than the rates found among their White counterparts. Finally, adults of Mexican American and Puerto Rican descent are more likely to be diagnosed with diabetes than Caucasians within the same age group.

Historically, African Americans routinely have experienced barriers to accessing quality health care. It was not uncommon for this population to be excluded from receiving medical treatment. In addition, during instances when African Americans were able to access medical care it was usually inadequate and even abusive at times (Wasserman, Flannery, & Clair, 2007). As an example, before and after the end of slavery in the United States, African Americans were unable to seek medical treatment due to their poor socioeconomic status. Additionally, medical facilities in the United States previously were legally segregated and lacked in providing appropriate care to people of color (Wasserman et al., 2007). As an alternative, they sought free medical treatment from teaching hospitals where care was often insufficient.

Adverse health conditions encountered particularly among African-Americans have been related to their exclusion from opportunities of quality health care. According to Wasserman et al. (2007), increasingly the disparities gap between and primarily by the African American population has been demonstrated to be linked to distrust of the medical profession and government officials. Among other circumstances, distrust was cultivated as a result of the 1930 Public Health Services (PHS) Tuskegee Syphilis Study.
During this tragic event, hundreds of Black men were denied treatment for syphilis over a span of 40 years after being diagnosed with this disease to allow researchers to observe the course of this condition. Penicillin, an antibiotic administered to people with syphilis, was not given to African American men involved in this study. Further, education about this disease being sexually transmitted or that infants could be born infected with this disease was not provided to these study participants by the PHS (Gilbert, Sawyer, & McNeill, 2011).

Not surprisingly, the impact and consequences from the Tuskegee study have elevated a sense of fear and mistrust of the government and medical providers. Consequently, motives of these professionals can pose some uncertainty among African Americans about how their quality of life and access to health services is addressed in the same manner as their counterparts in other populations. In such cases, this distrust has been correlated with reluctance among African Americans to participate in clinical trials, a significant obstacle in addressing health disparities among minority populations. In specific, such associated reluctance to participate in clinical studies can exclude African Americans from significant findings for treatments and new medications to reduce the effect of this chronic disease (Gilbert et al., 2011).

**Healthy People Objectives**

In this manner, an overarching goal specified in *Healthy People 2020* is to achieve health equity, eliminate disparities, and improve the health of all groups. Notably, there is an emphasis on reducing the disparity of this chronic condition. Decreasing the diabetes disparity would signify an improved quality of life of all persons
who have or are at risk for diabetes mellitus (HP 2020, 2015a). Strategy to improve the
quality of life for all persons with diabetes or those at risk is illustrated as objectives in
Healthy People 2020 (2015a). In particular, objectives explicit to diabetes highlight the
metabolic conditions and the serious health complications associated with this disease.
Specific Healthy People 2020 national health objectives include:

- “D-5 Improve glycemic control among persons with diabetes”
- “D-5.1 Reduce the proportion of people with diagnosed diabetes with an
  A1C value greater than 9%”
- “D-5.2 Increase the diabetic population with an A1c valued less than
  7%”
- “D-6 Improve lipid control among persons with diagnosed diabetes”
- “D-7 Increase the proportion of persons with diagnosed diabetes whose blood
  pressure is under control”
- “D-11 Increase the proportion of adults with diabetes who have a glycosylated
  hemoglobin measurement at least twice a year”
- “D-13 Increase the proportion of adults with diabetes who perform self-blood
  glucose monitoring at least once daily” (HP 2020, 2015a).

From a clinical perspective, these objectives can provide guidance for health
professionals in their efforts to decrease the devastating impact that diabetes has
especially among minority populations living in the United States. As noted in the
Healthy People 2020 agenda, these objectives serve as essential resources to decrease the
diabetes disparity and are described as screening recommendations by the USPSTF
Consequently, such screening recommendations particularly for populations most affected by type 2 diabetes can help to manage or prevent this chronic disease from occurring and reduce disparities.

Among populations on whom type 2 diabetes has the greatest effect, the USPSTF (2015) has recommended screening for type 2 diabetes in asymptomatic adults with sustained blood pressure either treated or untreated greater than 139/89 mmHg (NHLBI, 2012; USPSTF, 2015). In specific, elevated blood pressure measures are an important predictor of cardiovascular complications in people with type 2 diabetes mellitus. The first step in the application of this recommendation should be blood pressure (BP) screening (HP 2020, 2015a). This recommendation has been an indicator for screening among adults who demonstrated evidence of possible complications from diabetes.

Another note made by the USPSTF (HP 2020, 2015a) was the inclusion of recommended screening guidelines for lipid disorders in adults. In specific, it was recommended that:

- Men aged 20 to 35 years should be screened for lipid disorders if they are at increased risk for coronary heart disease.
- Women aged 20 to 45 should be screened for lipid disorders if they are at increased risk for coronary heart disease.
- Strong recommendation for screening men aged 35 and older for lipid disorders.
• Strong recommendation for screening women aged 45 and older for lipid disorders if they are at increased risk for coronary heart disease (HP 2020, 2015a).

These recommendations concerning lipid disorder screening were defined by the presence of diabetes, hypertension, and obesity (BMI $\geq 30$). In regard to risks associated with these three factors, the preferred screening tests for lipid disorders are total cholesterol and HDL-C on non-fasting or fasting blood samples (USPSTF, 2015).

**Diabetes Self-Management Education**

In addition to recommended screenings to address the diabetes mellitus disparity, the practice of diabetes self-management education (DSME) has been used by health professionals. In this context, the American Association of Diabetes Educators (AADE, 2015a) has described seven areas of diabetes self-management including:

• Knowing appropriate food portion sizes, best times to eat, and making healthy food choices are skills to self-manage diabetes

• To attain overall fitness, weight management, and blood glucose control with consistent physical activity is essential

• Daily self-monitoring of blood glucose levels increases peoples’ awareness of what necessary adjustments are needed regarding diet, physical activity, and medications

• Healthcare professionals can determine medications that should be taken by persons depending on their diabetes type
Attaining problem solving skills among people with diabetes can help with making informed choices about food and medications under different circumstances.

Increasing healthy behaviors such as smoking cessation, regular eye, foot and dental examinations can decrease complications from diabetes to optimize health and quality of life.

Acquiring healthy coping skills help to manage psychological distress that can impact health and indirectly influence individuals’ motivation to keep their diabetes in control.

*Healthy People 2020* depicted DSME as the process of teaching people to manage their diabetes (2015a). This practice of teaching people to manage their diabetes is outlined within three specific goals. The first goal involves controlling the rate of metabolism (which affects diabetes-related health). The second goal specifies prevention initiatives that address short and long term health conditions as a result of diabetes. Finally, the third goal is to achieve the best possible quality of life for clients, while keeping costs at an acceptable level.

Such goals can be implemented as community health interventions supported by policy initiatives. In addition, incorporation of policy initiatives can supplement clinical and DSME approaches in an effort to decrease the negative impact of diabetes especially among minority populations. Policy can be utilized by legislators or organizations to enhance physical environments of communities conducive to improving quality of life.
With a specific focus on the consequences and economics *Healthy People 2020* (2015a) reinforces the importance of policy initiatives that support reducing the impact of diabetes where disparities exist. As such, some of the initiatives are focused on street-scale urban design and land use that support an environment conducive to physical activity. The implementation of such designs would involve collaborative efforts from urban planners, architects, engineers, developers and public health professionals to change the physical environments beginning with small geographic areas in which high concentrations of affected people live and work (The Guide to Community Preventive Services [TGCPS], 2015a).

Emphasis is also noted by *Healthy People 2020* (2015a) that community-scale urban design land use, policies, and practices involved changing the physical environment of urban areas. This encompasses several square miles or more and specified ways to support increased participation in physical activity. Further, The Guide to Community Preventive Services (2015b) noted that policy instruments involved zoning regulations, building codes, other governmental policies, and builders’ practices. Design elements within this context were specified to include:

- “Proximity of residential areas to stores, jobs, schools, and recreation areas”
- “Continuity and connectivity of sidewalks and streets”
- “Aesthetic and safety aspects of the physical environment” (TGCPS, 2015b)

Implementation of community programs in addition to physical redesigning of environments can facilitate addressing diabetes from a population approach to improve quality of life for all community members. The thought of population health is focused
on addressing health issues affecting communities where entire populations have opportunities to be healthy (USDHHS, n.d.).

**Health Insurance and Care for Diabetes**

Aligned with quality of life and importantly in context with accessing quality health care, health insurance more than any other demographic or economic barrier exerts negative outcomes on the quality of health care received by minority populations (USDHHS, 2011). Distinctively, a lack of medical insurance can negatively influence quality health care specifically focused on diabetes management. In a recent Mortality Morbidity Weekly report, Ali, Bullard, Imperatore, Barker, and Gregg (2012) confirmed that health insurance status was important from the perspective of influencing the likelihood of having a standard healthcare provider and effective diabetes management. Study outcomes illustrated the number of persons with any public or private insurance who exhibited poor glycemic control was smaller when compared to the group of uninsured persons who also had poor glycemic control. In specific, Ali et al. documented that the prevalence of poor glycemic control was demonstrated (28.5%) in higher frequency among uninsured people. Such uninsured individuals with poor glycemic control were compared to those who were non-Medicare publicly insured recipients. In their analysis, researchers found poor glycemic control at a rate of 13% among non-Medicare publicly insured recipients. By contrast, prevalence of poor glycemic management associated with Medicare recipients was 12.6% whereas rates among privately insured persons were only 7.2%. The study outcome showed differences in
glycemic control, which suggests that the lack of health insurance access to quality health care can impede effective glycemic management.

Generally, minorities represent about one-third of the United States population and the consequential limitations. Importantly however, minorities make up more than half of the 50 million people living in the United States who are uninsured or may not have adequate access to health care necessary to engage in self-management of diabetes or its complications (USDHHS, 2011). Such evidence confirms the consequences associated with a lack of health insurance among racial and ethnic minority groups.

In regard to accessibility to health care services and sustaining a quality of life for this condition, it is important to note that approximately 56 million people living in America have insufficient access to a primary care health provider (USDHHS, 2011). Notably, the USDHHS has confirmed that members of racial and ethnic minority groups are overrepresented among those without access to a primary source of health care. In specific, minority children are less likely than their non-Hispanic White counterparts to have access to a consistent source of medical care.

In context with access to primary care, racial, and ethnic minorities are more likely than those of non-Hispanic White background to report encountering poorer quality patient-provider interactions (USDHHS, 2011). Evidence suggests that such interactions can exert a negative impact on effective diabetes management. Influencing the health of African Americans is their patient and provider relationship and access to quality health care. Researchers have found that African Americans perceive lack of empathy, cultural sensitivity, and poor communication skills from their health provider
(Polzer & Miles, 2005). As a result, African Americans are unlikely or reluctant to follow provider recommendations to self-manage their illness such as diabetes. Polzer and Miles noted that physicians who treated African American patients were less likely to recommend preventive screening tests compared to physicians who treated primarily Caucasian patients.

In their research Vaccaro and Huffman (2012) explained particularly, the lack of appropriate communication skills among healthcare providers can present negative health outcomes. Such outcomes can impede effective management of this chronic condition. The communication process between provider and patient can determine the extent to which the patient is informed, motivated, and confident enough to make the behavioral changes necessary to manage their diabetes care. Further, these researchers noted that it remains crucial for persons with diabetes to learn and practice adequate diabetes self-management skills. Knowledge about good management and associated skills can help to reduce risk factors that lead to morbidity and mortality occurrences associated with the disease and its related complications. In addition, researchers suggested that when communication from medical providers, although intended to be culturally sensitive and collaborative, is not delivered effectively, the content might not be received in the intended manner.

Interestingly however, outcomes from this study revealed that Mexican-American and Black non-Hispanic subjects were more likely to receive medical advice or be engaged in healthy diabetes self-management behaviors than the White non-Hispanic subjects. Also, evidence from the study suggested health care providers could have
selected more Black non-Hispanic participants to receive diabetes education than their White non-Hispanic counterparts. Additionally, it was demonstrated that subjects who received recent diabetes education were more likely to perform self-management behaviors.

In another study, Vaccaro et al. (2012) elaborated on how unsuccessful provider communication can exert a negative impact on self-management behaviors among minority populations. In this case, outcomes demonstrated that approximately one-third of the combined study sample (Black non-Hispanics, Mexican Americans, White non-Hispanics) reported not receiving advice to reduce fat and calories, increase physical activity, and control or lose weight from their health provider.

Critically, study outcomes of lifestyle care provided by the American Diabetes Association (2014d) was in direct contrast that persons with diabetes should be given lifestyle medical advice. According to the ADA (2013), persons with an A1C of 5.7%–6.4%, impaired glucose tolerance, or impaired fasting glucose should be counseled on lifestyle changes with goals similar to those of diabetes prevention programs. As such, lifestyle changes included 7% weight loss and moderate physical activity of at least 150 min/week.

Vaccaro et al. (2012) noted that there is some evidence to suggest that improvements in diabetes outcomes might not occur for minority patients even when physicians are made aware of racial disparity in diabetes care and outcomes. Additionally, in a 12 month randomized trial researchers noted that study findings demonstrated increased awareness of health disparities among providers post cultural
competency training. In light of this information, improvement in diabetes outcomes for patients still did not occur. This suggests potential negative impact upon performing effective diabetes self-management care especially among minority populations where diabetes is more prevalent.

Collectively, obstacles such as being underinsured, lack of a primary health provider, and negative patient provider interactions can impede receiving quality health care and attaining quality of life particularly among adult African Americans with diabetes. In light of such obstacles it is comprehensible that recommendations documented by The Guide to Community Preventive Services Task Force (2015c) have maintained that diabetes self-management education (DSME) interventions be implemented in community gathering places. Education at the community level can serve to enhance quality of life, patient provider relationships, and increase access to care for effective diabetes management. As such, these recommendations are based on sufficient evidence of the effectiveness for improving glycemic control among adults diagnosed with type 2 diabetes. DSME can be provided in a variety of community settings. These educational environments include community gathering places, homes, recreational camps, worksites, and schools (TGCPS, 2015c).

The Racial and Ethnic Approaches to Community Health (REACH) program of the Centers for Disease Control and Prevention has empowered people to seek better health. REACH has enhanced ways to help change local healthcare practices. Particularly, this program has initiated the mobilization of communities to implement
evidence-based public health programs in an effort to reduce health disparities across a broad range of health conditions (USDHHS, 2011).

In the research of Two Feathers et al. (2005), researchers explained the initiative of a REACH partnership between health facilities and community centers in the city of Detroit. The collaboration between the two entities addressed diabetes among populations of African Americans and Latino Americans. The Detroit based program was planned, implemented, and evaluated on culturally appropriate content that respectively addressed each of the two groups. Trained family health advocates, a diabetes educator, and a dietician led sessions. Program content included distribution of culturally sensitive diabetes literature and information during education sessions held at local community centers. Outcomes of this program demonstrated participants were receptive to session content. The program had also a moderate participant retention rate. Importantly, this type of programming could be easily replicated in similar type communities where disparities of diabetes are prevalent.

In response to reducing the prevalence of diabetes, the USDHHS (2011) promoted expanding the health centered quality initiative as in the REACH initiative study by Two Feathers et al. (2005). The intent of the health centered quality initiative was to provide technical assistance and resources to health centers to track control of blood pressure that enabled monitoring of the clinical management of diabetes. Aligned with this initiative was utilization of community health workers as members of interdisciplinary teams and multi-sector teams. Paid community health workers who are part of diabetes self-management training teams can help to improve provision of health
care, health education, disease prevention services, and connection to health homes. Furthermore, these workers could improve patients’ diabetes self-management skills in many ways. One such example is provision of plain language health-related information in non-clinical community settings (USDHHS, 2011). These prevention programs and initiatives can be utilized to enable all people and specifically minority populations most affected by diabetes to self-manage this chronic health condition.

**Construct of Self-Efficacy**

Addressing health behaviors associated with chronic diseases like diabetes mellitus are critical to reduce their impact among minority populations. Unhealthy behaviors practiced among populations where disparities exist can be addressed using behavioral health theories. Notably, the construct of self-efficacy pioneered by Albert Bandura from the Social Cognitive Theory (1986) can be utilized as an approach to examine and improve diabetes self-management behaviors. According to Bandura (2003), the construct of perceived self-efficacy can play a crucial role in the process of diabetes self-management and influence on health behaviors. Persons with diabetes have varying beliefs in implementing adequate control over their diet, exercise, and self-administration of insulin as part of their self-care regimen (Bandura, 1997).

Within the self-efficacy theory there are four major information sources of one’s self-efficacy. These four information sources are outlined as: (a) Enactive mastery experiences that include repeated successes that serve to build a strong sense of self-efficacy. Failures in contrast, become less likely to effect the judgment of a person’s capability to perform tasks (exercising in older age); (b) Vicarious experiences involve
observing others similar in nature and achieving performance of like behaviors or activities (older person exercising with physical limitations); (c) Verbal persuasion is a social perspective used to influence people (family, peers, or significant others) so they become capable of performing specific behaviors; (d) The physiological state included activities to reduce people’s emotional arousal to subjective fears which can increase self-efficacy related to improved health behaviors where people judge their capability to perform a behavior (pleasure walking in safe environment; Bandura, 1986).

**Study Purpose**

The purpose of this study was to analyze the influence of education programming type, scope of diabetes self-management education received, and selected demographics on self-efficacy among adult African Americans with type 2 diabetes.

**Research Questions**

1. Is there a difference in the level of self-efficacy between adults, particularly African Americans with type 2 diabetes, who participated in a faith-based diabetes education program as compared to those who did not?

   1a. If yes, is attending a faith-based program a predictor of self-efficacy, after adjusting for selected demographic variables?

2. Is there a difference in diabetes self-management education, including diet, physical activity, and glucose monitoring, among adults, particularly African American patients diagnosed with type 2 diabetes, who attended faith-based diabetes education programs as compared to those who did not?
2a. If yes, is attending faith-based diabetes education programs a predictor of diabetes self-management education, after adjusting for selected demographics?

3. Is there a relationship between self-efficacy and diabetes self-management education among adults, particularly African American patients diagnosed with type 2 diabetes?

3a. If yes, is this relationship the same for those who attended faith-based diabetes education programs as compared to those who did not?

**Basic Assumptions**

- Self-efficacy should be a strong predictor of or promote diabetes self-management behaviors.

- Diabetes self-management should improve through increased self-efficacy among adult African Americans diagnosed with type 2 diabetes when they participate in some type of diabetes health education and promotion program. Subsequently, there should be a difference in or increased diabetes self-management education among study subjects who participate in a faith-based organization program.

- Adult African Americans with diabetes who participate in faith-based health education programs, should have increased self-efficacy scores as compared to study subjects in the clinical environment. As such, there should be a potential positive and linear correlation between diabetes self-management education and self-efficacy among the two study groups.
Definition of Terms

_African Americans_: In the United States, the African American population includes individuals whose ancestors were brought to this country as slaves, as well as more recent immigrants born in other countries (American Cancer Society [ACS], 2011, p. 1).

_Blood glucose monitoring_: The main tool used as a self-check for blood glucose level at any one time to monitor diabetes control (ADA, 2015e).

_Blood pressure_: Force of blood flow inside the blood vessels. Healthy blood pressure is below 120/80mm/Hg. The first number is the pressure as the heart beats and pushes blood through the blood vessels called the “systolic” pressure. The second number is the pressure when the vessels relax between heartbeats called the “diastolic” pressure (ADA, 2014b).

_Church-based organization_: A structured type of faith-based organization where health promotion and disease management programs are hosted or sponsored by a religious congregation that support the well-being of its members and community (Peterson & Atwood, 2002; Warren & Charles, 2011).

_Clinical-based intervention_: Health professionals/teams who can provide care/services to patients with chronic conditions such as diabetes to help patients achieve optimal self-management care for their illness (Diabetes Care, 2013).

_Diabetes mellitus_: A group of diseases characterized by high blood glucose levels that result from defects in the body’s ability to produce and/or use insulin (ADA, 2015a).
Diabetes self-management education: Diabetes self-management education (DSME) is the process of teaching people to manage their diabetes (AADE, 2015b; HP 2020, 2015a).

Faith-based organization: Places sponsored by or affiliated with worship or religious congregations that provide health education or disease management programs to communities through multifaceted social networks (Asomugha, Derose, & Lurie, 2011; Warren & Charles, 2011).

Hemoglobin A1C: Measures one’s average blood glucose control over the past 2 to 3 months. It is the percent of glycated hemoglobin in the blood. Normal hemoglobin A1C value is less than 7% (ADA, 2015a).

Self-efficacy: People’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performance (Bandura, 1986).

Type 2 diabetes: Most common form of diabetes where the body does not produce enough insulin or cells ignore the insulin (ADA, 2015f).

Waist circumference measurement: Another way to assess one’s weight is to place a tape measure around one’s bare abdomen just above the hipbone to measure waist size (circumference) (CDC, 2015d).
CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study was to analyze the influence of education programming type, scope of diabetes self-management education received, and selected demographics on self-efficacy among adult African Americans with type 2 diabetes.

Diabetes

Beta cells within the pancreas produce the hormone insulin (CDC, 2015a). Generated in sufficient amounts, insulin is used to convert glucose into energy for use by the body. When the pancreas generates insufficient quantities of insulin or the body is unable to use the insulin that is produced properly and blood glucose increases above normal levels. The condition when blood glucose levels are observed to be above normal is also recognized as diabetes mellitus.

The American Diabetes Association (2015a) defined diabetes mellitus as a group of chronic diseases designated by increased blood glucose levels that are above normal levels. As a rule, normal blood glucose levels before eating a meal range between 70 mg/dl and 130 mg/dl, whereas levels measured 1 to 2 hours after eating a meal that are less than 180 mg/dl are considered to be normal. In this fashion diabetes is indicated and can be managed by monitoring such levels.

Serious health complications can result from unmanaged elevated blood glucose levels associated with diabetes. If left untreated over time, such elevated levels can damage nerves and blood vessels throughout the body. The associated health consequences that can develop from damaged nerves and blood vessels include
cardiovascular disease, stroke, renal disease, neuropathy, limb amputation, and blindness. Oral infections also have been noted as an associated diabetes complication (United States Department of Health and Human Services Office of Minority Health [OMH], 2014a).

One condition typically associated with increased blood glucose levels is hypertension. To compound this matter, research has confirmed that on average, every two out of three persons diagnosed with diabetes also have elevated blood pressure (CDC, 2012a). Hypertension or high blood pressure observed at 140/90 mmHg causes the heart to pump faster to compensate for the increased blood pressure. As a result, this increased pressure can damage blood vessels and create blockages. The blocked vessels become a critical risk factor for cardiovascular disease and stroke among people with diabetes (CDC, 2012a). Adults diagnosed with type 2 diabetes are 2 to 4 times more likely than people without diabetes to die from a heart attack or experience a stroke.

The combined effects of elevated blood pressure and glucose levels sustained over a period of years can cause blindness, another complication related to diabetes. Due to the combination of such elevated levels in the blood stream liquid is leaked into the retina of the eye. Small blood vessels become swollen or blocked (CDC, 2012a). As a result blurred vision can develop leading to blindness.

Renal disease also has been documented as a complication common among individuals diagnosed with diabetes mellitus. Diabetic nephropathy (renal disease) can develop when cells and blood vessels in the kidney become damaged as a result of elevated blood glucose levels (CDC, 2012a). In response to better manage high glucose
levels in the bloodstream, the kidneys filter more blood than is customary. Over time, the kidneys can begin to compensate in response to this demand in the body. Functioning in such a capacity, the kidneys eventually become injured. This damage affects the ability of the kidneys to filter waste from the body. As a consequence, waste builds up in the bloodstream instead of being excreted. In extreme cases, kidney failure is a common outcome among people with diabetes.

Diabetic neuropathy is a medical term used to describe damage to the nervous system, another complication associated with diabetes (CDC, 2012a). Neuropathy most commonly affects the nerves in the arms and legs. Unmanaged elevated blood glucose levels can cause damage to the blood vessels that bring oxygen to the nerves and nerve coverings. As a result, nerves can stop transmitting messages, transmit messages too slowly, and/or transmit impulses at the wrong time. As a consequence numbness, pain, and weakness can occur in the hands, arms, and legs. Additionally, infections can occur related to nerve damage. Decreased sensation from numbness and weakness that develop from nerve damage, sores and cuts that occur in arms or legs can go unnoticed. In some cases infections can develop when such wounds are not addressed appropriately. In addition, among individuals with diabetes such infections can take longer to heal.

The amputation of a leg or foot is common among people diagnosed with diabetes mellitus. Elevated blood glucose levels cause blood vessels of the foot and leg to constrict and harden (ADA, 2015g). As a result, blood flow to the feet and legs is decreased. Due to reduced blood circulation blood vessels also are injured. In this manner the condition of peripheral arterial disease (PAD) also is a complication that
generally can be found among people diagnosed with diabetes. In similar fashion PAD occurs when blood vessels in the legs are constricted by fatty deposits. As a consequence, blood flow is reduced. The combination of PAD with neuropathy increases peoples’ susceptibility to infections and ulcers involving lower limb extremities. These health issues are compounded by the effects of reduced lower extremity sensation and blood flow that can go unrecognized (ADA, 2015g). In such cases, limb amputation of the leg or foot can be necessary.

People diagnosed with diabetes are more likely to experience complications due to infections that develop with their gums and teeth than their counterparts who are not affected by the consequences of this chronic condition. Unmanaged blood glucose levels increase susceptibility to oral bacterial infections among people with diabetes. Over time the body’s ability to fight bacterial infections becomes weakened. Such infections readily attack the gums resulting in gum disease. Periodontitis, a particular type of gum disease (CDC, 2012a), is evident when this disease process results in gums beginning to pull away from the teeth. As a consequence, loss of teeth or extractions becomes necessary. Additionally, limited research suggests (ADA, 2014c) serious gum disease could be a factor that causes blood sugar levels to continue to become elevated. Once the body’s ability to fight infection (e.g., oral) begins to decrease or becomes more susceptible to infections blood glucose levels have a tendency to increase. In such cases diabetes can become more difficult to manage.

The three most common types of this chronic condition include gestational, type 1, and type 2 diabetes mellitus. Gestational is the particular type of diabetes mellitus that
appears only among pregnant women. It is estimated that gestational diabetes is a condition that affects 2% to 10% of all pregnancies (CDC, 2015a). Importantly, this condition can occur among women who were never diagnosed previously with diabetes (ADA, 2014c). During pregnancy, hormones generated by the placenta to help with fetal development block insulin from functioning properly. As a result, the body is unable to produce or use all of the insulin needed. As a consequence the pregnant female is confronted with elevated levels of blood glucose. In most cases, gestational diabetes disappears soon after a woman gives birth. Importantly however, once gestational diabetes has developed in an expectant female, the risk of being diagnosed later in life with another form of diabetes is increased.

Of note is the fact that elevated blood glucose that develops during pregnancy can cross the placental barrier and reach the fetus. Consequently, blood glucose levels can become elevated in the developing fetus. In such cases, once formed the pancreas of the fetus begins to generate larger amounts of insulin to manage increased blood glucose levels. In instances where elevated glucose levels are sustained in the fetus, the condition of macrosomia can occur (ADA, 2014c; CDC, 2010). A fetus with macrosomia grows to be abnormally large (e.g., 9 lbs. to 10 lbs.) due to the accumulation of fat stores. Importantly, a C-section (surgical procedure through the mother’s abdomen) could be necessary to deliver such a baby with this condition. Another health risk associated from macrosomia includes nerve damage to the shoulder area of the fetus due to pressure applied on the shoulders during delivery through the birth canal. Additionally, elevated insulin levels can cause very low blood glucose levels to be observed at birth. Finally,
evidence also has confirmed (ADA, 2014c) that when the fetus produces excess insulin, the child can develop risk factors for the occurrence of obesity during childhood and type 2 diabetes in adulthood.

Notably, gestational diabetes can be managed by improving dietary practices. In specific, the development of meal plans in consultation with a medical professional and supervised physical activity are recommended as management strategies. Finally, among women with gestational diabetes, daily glucose monitoring and in some cases, short-lived insulin therapy are prescribed as interventions to control this condition.

Type 1 is another form of diabetes mellitus that is insulin dependent (ADA, 2015b). Previously referred to as juvenile diabetes, this condition most often is diagnosed among children and young adults. It is important to note, however, that type 1 diabetes can occur in adulthood at any age. Approximately, 5% of people with diabetes have been diagnosed with this form of the disease (ADA, 2015b). Type 1 diabetes is characterized by elevated blood glucose levels due to the body’s inability to produce sufficient insulin. Distinctively, this form of diabetes emerges when the body’s immune system attacks the insulin-producing beta cells in the pancreas. As a result of this immune process, critical beta cells are destroyed. Once the sufficient level of healthy beta cells has been reduced, the pancreas is capable of producing only very little or no insulin at all (ADA, 2015b; CDC, 2015a). As such, once beta cells have been destroyed and the insulin producing capacity is reduced, there is no other physiological mechanism to convert blood glucose into needed energy for the body.
To help manage type 1 diabetes, insulin therapy is the most common treatment modality for controlling elevated blood glucose levels. A daily regimen of insulin injections via syringes, pens, or pumps is used to administer prescribed doses of insulin to improve glucose control (ADA, 2015a). In addition, increasing levels of physical activity (e.g., walking, biking, etc.) is advised to establish or maintain a healthy weight to better manage this disease state. Finally, improved nutritional practices including monitoring and managing portion sizes and sustaining overall healthy dietary behaviors are recommended to help those affected to manage type 1 diabetes.

According to the Centers for Disease Control and Prevention (2015a), type 2 diabetes is the most common form of this chronic condition among people living in the United States. Also, referred to as non-insulin dependent diabetes mellitus (NIDDM), type 2 diabetes primarily is diagnosed among middle-aged and older adults but can appear in younger people. Research has determined that heredity is a critical contributing factor to the diagnosis of this condition. As such, type 2 diabetes is found more often among people with a family history (e.g., siblings, parents) of this condition. In addition, individuals who have sedentary lifestyles and unhealthy diets experience this kind of diabetes with greater frequency than their adult counterparts.

Like other diabetic conditions, type 2 is characterized by abnormally high blood glucose levels. In specific, this condition is diagnosed among people with fasting blood glucose levels that are greater than or equal to 126 mg/dl. This disease condition results when the pancreas generates insufficient amounts of insulin, or the body is unable to use available insulin properly. In either circumstance such insulin resistance occurs when the
quantity of insulin that is produced by the pancreas cannot deliver glucose to cells of the body to be used for needed energy. As a result, glucose accumulates in the bloodstream. Little is known about the mechanism that results in such abnormal use of insulin (ADA, 2015a).

Evidence suggests that type 2 diabetes mellitus can be managed by engaging in healthy dietary behaviors, participating in regular physical activity, and losing weight. In this context, research has demonstrated that people can decrease their risk for being diagnosed with type 2 diabetes by 58% by engaging in specific lifestyle changes (ADA, 2014d).

In specific, the American Diabetes Association (2014d) recommended that people diagnosed with type 2 diabetes should engage in the following lifestyle changes:

- Lose 7% of their body weight, and
- Perform physical activity in moderation and on a regular basis

As an example, people weighing 200 pounds should lose 15 pounds to achieve a 7% decrease of body weight. As an additional way to reduce body fat, walking vigorously 30 minutes a day five days a week has been identified.

In addition to recommended lifestyle changes, oral medications (pills) are prescribed to support disease management (ADA, 2013c). One such drug, metformin, is prescribed in doses administered at least twice each day. This drug when used appropriately can decrease blood glucose levels by reducing the quantity of glucose generated by the liver. In addition, metformin can help decrease blood glucose levels by
increasing the sensitivity of muscle tissue to insulin so glucose can be absorbed more effectively by the body (ADA, 2013c).

In some cases, insulin therapy becomes necessary as a treatment regimen to lower elevated glucose levels among people with type 2 diabetes (ADA, 2015a). Prescribed by clinicians, insulin injections by pens, syringes, or pumps are used to administer appropriate insulin doses to establish and maintain normal glucose control.

Notably, another type of diabetes mellitus is recognized as prediabetes. This condition is diagnosed among people who have blood glucose levels that are higher than normal (fasting blood glucose of 100–125 mg/dl), but not sufficiently elevated to warrant a diagnosis of one of the other types of diabetes (ADA, 2014d). Other names for prediabetes include impaired glucose tolerance or impaired fasting glucose.

When confronted with this chronic condition, people are encouraged to practice healthier lifestyle behaviors to prevent or delay the onset of type 2 diabetes. In this manner elevated blood glucose levels can return to normal in some cases (ADA, 2014d; CDC, 2013). In specific, these behavioral recommendations include increased engagement of:

- Moderate physical activity
- Aerobic exercises
- Muscle strengthening activities

Engaging in such physical activity behaviors on a routine basis can help to decrease body weight by 7%, a process to better manage glucose levels. Additionally, sustaining a healthy diet is attributed to retaining normal blood glucose levels (ADA, 2014d).
Limited research (Malin, Gerber, Chipkin, & Braun, 2012) suggests also that the combination of physical activity and intake of prescribed doses of metformin or other medication can be a useful strategy in the prevention or delay of type 2 diabetes from prediabetes. In their analysis, researchers (Malin et al., 2012) noted outcomes from the Indian Diabetes Prevention Program demonstrated that the combination of 500 mg/dl of metformin administered per day along with lifestyle modification could improve insulin sensitivity. As a result, this management strategy has the potential to reduce progression from prediabetes to type 2 diabetes.

**Incidence and Prevalence of Diabetes Mellitus**

Diabetes mellitus is a devastating public health problem, which affects 29.1 million people of all ages living in the United States (ADA, 2015d). According to 2012 data documented by the American Diabetes Association (2015d), of this total only 21.0 million Americans had actually been diagnosed with some type of diabetes mellitus. Notably, there were still 8.1 million people of all ages who remained undiagnosed with this condition and, therefore, left untreated. In addition, data have confirmed that among U.S. residents 65 years of age and older, 11.8 million people were diagnosed with diabetes mellitus in the year 2010 alone. Noteworthy, among people aged 20 years and older in 2012, 1.7 million newly diagnosed cases of diabetes occurred, whereas 1.9 million new cases of this chronic condition, were diagnosed in 2010. Importantly in 2010, diabetes was confirmed to be the seventh leading cause of death among people living in the United States. These findings were based on diabetes having been noted as the underlying cause of death on 69,071 death certificates that year (ADA, 2015d).
Additionally, evidence collected by the United States Department of Health and Human Services Office of Minority Health (OMH, 2014a) has documented that approximately 35% of adults living in the United States aged 20 years or older, currently have prediabetes. This percent is considerable, given that prediabetes affects 79 million of all people living in the United States (ADA, 2015d).

**Screening for Diabetes**

Importantly, blood glucose screening should be conducted by health care professionals. If testing reveals that initial glucose levels in the bloodstream are higher than normal, clinicians can designate what follow-up is appropriate to diagnose diabetes mellitus. If blood glucose levels are within the normal range at the time of the initial screen, the American Diabetes Association (2014d) has suggested that individuals seek preventive health checks every three years. Significantly, such preventive health checks could be prescribed more often by a doctor.

All individuals who are 45 years of age or older and overweight should be checked for prediabetes. Additionally, once a medical professional has diagnosed the condition of prediabetes, it is advised that a preventive check for type 2 diabetes be performed every one to two years (ADA, 2014d).

Diabetes mellitus can be identified with different screening formats. The hemoglobin A1C test measures average blood glucose levels retrospectively over 2 to 3 months. Increased blood glucose levels are determined from this screening format when values are observed greater than or equal to 6.5% (ADA, 2014d). Hemoglobin A1C values detected between 5.7%–6.4% are indicative of a diagnosis for prediabetes.
Consequently, diagnosing this condition with this particular screening format, the risk of developing diabetes complications of blindness, kidney, and nerve disease can be reduced by 40% as a method for managing better glucose control. Notably, a reduction of elevated blood glucose by as little as 1% (e.g., from 8.0% to 7.0%), monitored by hemoglobin A1C screening, can help to prevent these health complications from occurring (CDC, 2011b).

Another form of diabetes screening is known as the fasting plasma glucose (FPG). This testing process determines fasting glucose levels in the bloodstream. Fasting means not having anything to eat or drink (except water) for at least 8 hours before testing is performed. As a rule, the FPG should be performed first thing in the morning before breakfast is consumed (ADA, 2014d). A diagnosis of diabetes in this instance can be determined by a clinician when fasting blood glucose levels are observed to be greater than or equal to 126 mg/dl. Further, the condition of prediabetes can be determined from a fasting blood glucose level identified within the range from 100 to 125 mg/dl (ADA, 2014d).

The oral glucose tolerance test (OGTT) is a two-hour test that helps medical professionals discern how blood glucose is processed in the body (ADA, 2014d). This type of screening involves swallowing a solution of high glucose content prescribed by a medical professional. The OGTT then is used to check blood glucose levels before and 2 hours after drinking the prescribed beverage. A diagnosis of diabetes mellitus is made if the results of the OGTT reveal levels of blood glucose greater than or equal to 200 mg/dl.
Blood glucose levels from the OGTT determined between the range of 140 mg/dl–199 mg/dl are indicative of prediabetes.

Self-monitoring and management testing is the screening protocol that customarily is performed by individuals. Particularly, individuals without immediate medical supervision randomly (also known as casual) check their plasma glucose level (ADA, 2014d). This routine test is a blood glucose level check that can be performed any time of the day. A small computerized machine known as a glucose meter is used to determine blood glucose levels. To perform this test, a small amount of blood obtained from a fingerstick is measured by such a glucose meter. The blood glucose level then is displayed on the meter screen.

**Diabetes Risk Factors**

Research has documented that modifiable and non-modifiable risk factors increase the susceptibility of individuals to type 2 diabetes. The designation of overweight or obese represents a modifiable factor that can greatly influence risks to diabetes. Being overweight or obese can inhibit the body from generating sufficient amounts of or transporting insulin to cells (CDC, 2012a). Excess weight, principally surrounding the abdomen, makes it difficult for cells to use insulin for needed energy. As a result, blood glucose becomes elevated.

Overweight and obesity are both terminology used for ranges of weight that are greater than what is usually considered healthy for a given height (CDC, 2012b). The body mass index (BMI) calculated from a height and weight ratio is used to categorize ranges of normal and abnormal measurements. BMIs calculated, for example, between
18.5 and 24.9 are considered normal for individuals with a height measured at 5’9” and weight range determined between 125 lbs. to 268 lbs. On the other hand, a BMI calculated between the range of 25 to 29.9 with the same height and weight measurements observed between 169 lbs. and 202 lbs. are designated as being overweight (CDC, 2012b). Performing lifestyle changes such as participating in some form of physical activity on a daily basis and eating healthy meals can help individuals lose weight. In addition, maintaining a healthy weight has been demonstrated to help better manage diabetes mellitus.

Approximately, 70% of adults diagnosed with diabetes have high blood pressure. Elevated blood pressure is another modifiable complication related to diabetes mellitus. Increased blood pressure also known as hypertension (> 139/89 mm Hg) is sometimes associated with being overweight. Blood pressure is the force of blood flow inside the walls of blood vessels. When people experience elevated blood pressure their heart beats at a faster pace to compensate for the increased pressure occurring in the body’s blood vessels (ADA, 2014b). Consequently, when increased blood pressure occurs over time this can lead to stroke, renal or heart disease, and even blindness. These health conditions have also been linked to blood glucose levels above normal.

Maintaining normal blood pressure levels observed at less than 120/80 mm Hg along with managing normal blood glucose levels can reduce risk of damage to eyes and kidneys, by approximately 33% (CDC, 2011a). Additionally, the risk of heart disease and stroke can be reduced among people diagnosed with diabetes by approximately 33% to 50% when maintaining normal blood pressure control (CDC, 2011b). Healthy eating,
daily exercising, and taking prescribed medications are treatment strategies that can help people manage normal blood pressure levels (CDC, 2011b).

Another modifiable risk factor to diabetes is managing abnormal levels of blood cholesterol. Cholesterol is a form of fat known as lipoproteins used in the body (ADA, 2014a). Cholesterol blood levels are associated with increased blood pressure and blood glucose levels. When cholesterol blood levels remain excessively high, the inside walls of large blood vessels become narrowed. Eventually, these vessels become clogged. As a result, obstructed blood vessels can lead to heart disease and stroke. These two chronic health conditions are more likely to be manifested in greater frequency among people with diabetes.

Maintaining normal cholesterol blood levels can help prevent the chronic health conditions of heart disease and stroke. Additionally, related circulation problems, a common health risk among people diagnosed with diabetes, can be prevented when normal cholesterol levels are sustained. Following a regimen of physical activity such as walking 30 minutes a day and healthy eating (e.g., fruits, vegetables) can help people reach normal cholesterol levels. It is essential to maintain healthy blood levels of cholesterol types in an effort to reduce diabetes health related complications. Managing control of normal cholesterol blood levels can reduce the risk of cardiovascular complications associated with diabetes by 20% to 50% (CDC, 2011c).

A type of cholesterol known as low-density lipoproteins (LDL), or “bad” cholesterol, is generated in the body and can lead to elevated blood cholesterol accumulating in the arteries (ADA, 2014a). The buildup of LDL in the arteries can create
blocked vessels. As a result elevated blood cholesterol levels can lead to chronic conditions of heart disease and stroke. LDL measurements observed lower than 100 are considered normal blood levels (CDC, 2011b). Managing healthy LDL blood levels with a diet low in fat is the most effective way to protect and increase longevity of the heart and blood vessels.

Another form of cholesterol identified as high-density lipoproteins (HDL), or “good” cholesterol, is found in the body (ADA, 2014a). HDL helps to remove cholesterol from the body. In this manner, higher HDL blood levels can help prevent any unhealthy accumulation of cholesterol in blood vessels. A diet low in fat and cholesterol consumed with sufficient quantities of fresh vegetables, whole grains, and fruits help to sustain healthy levels of cholesterol in the bloodstream. Among adult males HDL (“good” cholesterol) blood levels greater than 40 are considered normal. HDL blood levels are considered normal when observed at levels of more than 50 among adult women (ADA, 2014a).

Triglycerides are another kind of lipoprotein produced by the body (ADA, 2014a). If triglyceride blood levels are abnormally high this can increase peoples risk for a heart attack or stroke. Triglyceride blood levels observed less than 150 are considered normal among adults (ADA, 2014a). To better manage good triglyceride levels in the bloodstream performing lifestyle behaviors such as regular physical activity and eating a healthier diet are recommended.

Modifiable risk factors of abnormal levels of blood pressure and cholesterol can be controlled by making lifestyle modifications. In contrast to healthy behavior changes
such as increased physical activity and eating a healthy diet that can help control abnormal levels of blood glucose, blood pressure, and blood cholesterol, there are intrinsic factors attributed to increasing the risk for diabetes among individuals. A non-modifiable risk factor for diabetes is represented among people who have a family history of the disease (ADA, 2015c). Among such people with a family history significant risk for diabetes is increased among those who have parents or siblings diagnosed with this chronic illness. Families who practice similar behaviors such as unhealthy eating habits and physical inactivity are commonly associated with the occurrence of this condition. As a consequence of family history risk, increased awareness of this factor is a vital step that can help people understand the need to consult a medical professional for appropriate diabetes screening. Increasing knowledge among people who have a family history of diabetes can be an early preventive strategy that can delay or prevent diabetes from occurring among other family members.

When considering the variable of age as a non-modifiable risk factor among individuals under the age of 20 years, 208,000 people have this chronic condition (ADA, 2015d). This younger population encompasses 0.25% of all people living in the United States. In total this percent of the population among Americans affected involves approximately 1 in every 400 children and adolescents who are diagnosed with diabetes mellitus. To greater degree, 28.9 million people aged 20 years and older have been diagnosed with this chronic illness. Individuals 20 years or older are comprised of 12.3% of the United States population. Additionally, 11.8 million people who are 65 years of age or older living among the U.S. population have a diagnosis of diabetes. These data
confirm that 25.9% of the American population in this age group was affected by some form of diabetes mellitus (ADA, 2015d). In reference to age among minority populations, evidence has documented that between the years 2007–2009 people most commonly diagnosed with diabetes were 20 years of age or older. This evidence was found particularly among populations of non-Hispanic Blacks (13.2%) and Hispanics (12.8%; ADA, 2015d). It is evident these data substantiate that the risk for type 2 diabetes is increased among people as they grow older. Importantly, the disparity of diabetes among minority populations especially affects the elderly.

In addition to data confirming links between the non-modifiable risks of age and family history and having a diagnosis of diabetes, another risk for diabetes is race and or ethnicity. Evidence obtained by the USDHHS OMH (2012) documented that racial and ethnic minority groups are disproportionately affected by diabetes among these populations. Additionally, the disparity of type 2 diabetes is more widespread within minority populations of African Americans, Latinos, Native Americans, Asian Americans, and Pacific Islanders when compared to their White counterparts. To a lesser scope only 7.6% of non-Hispanic Whites and 9.0% of Asian Americans are affected by this chronic illness (ADA, 2015d). To compound this matter, minority populations such as African Americans are more likely to be overweight and experience high blood pressure. Additionally, cultural behaviors and attitudes (e.g., similar unhealthy eating or inadequate exercise behaviors) have been associated with such risk factors among this population. According to the Department of Health and Human Services Office of Minority Health (2014b), among adult African Americans 40% of this population is more
likely to experience the condition of high blood pressure (> 139/89 mm Hg). It has been noted that 10% of the adult African American population do not consistently manage normal blood pressure control compared to similar segments of the non-Hispanic White population (OMH, 2014b).

Compounding the effects of cardiovascular health risks is physical inactivity. Researchers (Peterson & Atwood, 2002) also have documented that particularly, minorities, older adults, people of lower socioeconomic status, and individuals with limited education have been noted as leading less active lifestyles.

The combination effects of family history, age, and race are non-modifiable risk factors that can significantly increase the disparity of type 2 diabetes among minority populations. Data from 2011 demonstrated that African Americans were 1.5 times as likely to be obese than their non-Hispanic White counterparts. Particularly four out of five African-American women were obese or overweight. In 2011 African-American women were approximately 80% more likely to be obese compared to non-Hispanic White women (OMH, 2014b).

On average, adult African Americans are twice more likely to have diabetes than their White counterparts. The OMH (2012) documented that the Centers for Disease Control and Prevention estimated that 12.6% of non-Hispanic Blacks were diagnosed with diabetes in the year 2009. Notably, 3.2 million of all African Americans aged 20 years or older have been diagnosed with some form of diabetes mellitus (OMH, 2012). This averages to 13.3% of the total population of African Americans. According to the USDHHS OMH (2012), the highest incidence of diabetes among African Americans
occurs between the ages of 65–75 years. Particularly, adult African American women are affected by this chronic illness. When adjusted for age, African American females are more likely to be diagnosed with diabetes when compared to their non-Hispanic White and Hispanic counterparts. Further, the prevalence of diabetes is greater among African American women when compared to African American men within the same age range.

African Americans with diabetes are more likely to experience complications from diabetes. Lack of access to health care, cultural attitudes, and behaviors have been noted as barriers to preventive and diabetes management care among such populations. Particularly, such barriers have been attributed to acquiring health conditions of end-stage renal disease and amputations of lower extremities (legs and feet). These diabetes related complications are more prevalent among African Americans when compared to their White counterparts affected by this chronic disease (OMH, 2014a). Such related complications of end-stage renal disease and amputations of lower extremities (legs and feet) from diabetes are more common among adult African Americans with this chronic condition. In 2008, adult African American men were 2.7 times more likely to begin treatment for end-stage renal disease compared to their non-Hispanic White counterparts (OMH, 2014a).

In their analysis Newman Geiger, Appel, Davidhizar, and Davis (2008) further explained that African Americans generally have poorer outcomes related to health status. Recognized as a vulnerable population in respect to health outcomes and status adult African Americans are faced with varying challenges. Such challenges include being a single parent, being sole head of household, and living in medically underserved
areas and in geographically low-income regions of the United States. Importantly, a primary reason attributed to increased vulnerability among this population noted by Newman Geiger et al. (2008) is the limited availability of opportunities to learn health information. Further, in some cases, lack of funds to pay for medical service, lack of access to services, lack of trust in medical services, and lack of alternative therapies offered are attributed to lack of recommendations for medical services from family and friends also as cultural aspect.

Heredity has also been associated with the occurrence for diabetes among minority populations. According to documentation from the Centers of Disease Control and Prevention (2012c) scholars have identified a “thrifty gene” attributed to diabetes, among African Americans, Hispanic/Latino Americans, American Indians, Asian Americans, and Pacific Islander Americans. This genetic material was used as a resource to store food as energy during times when food was abundant among past generations of these populations (CDC, 2012c). This process for storing food as reserved energy became a tool for survival during times when food was not plentiful. As a result, this gene that became a source for initiating energy reserves could increase peoples’ susceptibility for type 2 diabetes (CDC, 2012c). There is limited research available concerning the influence of genetics among ethnic groups and in particular African Americans. According to the American Diabetes Association (2015b) another gene, HLA-DR7 could potentially be a hereditary risk factor for type 2 diabetes among African Americans. Such evidence is noteworthy among minority populations such as African
Americans who are disproportionately affected by and could greatly influence the disparity of this chronic condition among this population.

Additionally, diabetes is the seventh leading cause of death in the United States (CDC 2011a). The incidence of death is increased among individuals who have been diagnosed with diabetes mellitus. In 2009, data reflected that adult African Americans were 2.2 times more likely to die from diabetes compared their non-Hispanic White counterparts (OMH, 2014a). Among the American population women in general diagnosed with diabetes have decreased life expectancy compared to women without diabetes (CDC, 2012c). The mortality incidence among women 25 to 44 years of age with diabetes is more than 3 times the occurrence among women without diabetes (CDC, 2012c).

Clinical Care: Chronic Care Model

The American Diabetes Association (2013a) has recommended that diabetes care be aligned with components of the Chronic Care Model (CCM). Such components ensure productive interactions occur between a proactive health care team and informed patient. The CCM has been demonstrated in many studies to be an effective foundation for improved diabetes care. Included in the model are six essential components for the provision of optimal care for patients with this chronic disease in the CCM: (a) “delivery system design (moving from a reactive to a proactive care delivery system where planned visits are coordinated through a team based approach),” (b) “self-management support,” (c) “decision support (basing care on evidence-based, effective care guidelines),” (d) “clinical information systems (using registries that can provide
patient-specific and population-based support to the care team),” (e) “community resources and policies (identifying or developing resources to support healthy lifestyles),” and (f) “health systems (to create a quality-oriented culture)” (ADA, 2013a). The description of clinical staff responsibilities and promotion of diabetes self-management are essential for the successful implementation of the CCM among patients. As a result, multidisciplinary health professional teams can provide care for patients with chronic conditions such as diabetes that can facilitate the performance of patients to achieve optimal self-management care for their illness (ADA, 2013a).

According to the American Diabetes Association (2013a) people diagnosed with diabetes mellitus should receive medical care from a qualified health professional team. This team encompasses but is not inclusive of, physicians, nurses, dietitians, pharmacists, and mental health professionals with expertise in diabetes. It is critical to align this team of health professionals to enable individuals diagnosed with diabetes to play a role in their self-management care. A diabetes management plan should also be created as a partnership among the patient, their family, physician, and other members of the health care team. Such management strategies should provide adequate education and problem-solving skills that encompass different aspects of diabetes management care (ADA, 2013a). Implementation of a management plan requires goals and treatment therapies to be individually tailored that enable patients to make informed choices. The management plan should be in context with diabetes self-management education (DSME) as an essential component of care.
Care and Management of Diabetes

The Care and Expenditures of Diabetes

Medical care is critical in order to prevent or decrease the risk of long-term complications from diabetes mellitus. These complications can add to the economic burden on the United States health care system. According to the American Diabetes Association (2013b), the total estimated cost of diagnosed diabetes among people living in the United States was $245 billion in 2012. This estimated cost noted from the year 2012 was a significant increase compared to $174 billion in diabetes related total costs that occurred in 2007. Expenditures attributed to the $245 billion included $176 billion spent towards direct medical costs and $69 billion in reduced productivity expenses. Direct medical costs include hospital inpatient care, prescription medications to treat diabetes complications and supplies for diabetes. The majority of direct medical costs are incurred by individuals 65 years of age and older. People with diagnosed diabetes incur medical expenses that are approximately 2.3 times higher than what medical payments would be for their counterparts without diabetes (ADA, 2014e).

Care needed for people with diagnosed diabetes accounts for more than 1 in 5 health care dollars in the U.S. Indirect medical costs associated with diabetes include increased absenteeism ($5 billion), reduced productivity while at work ($20.8 billion) and the inability to work due to diabetes related disability ($21.6 billion; ADA, 2014e). In relevance to the economic burden diabetes mellitus has upon millions of Americans it is reasonable to assume this disease would require ongoing medical care and self-management.
Additionally, increased costs can be attributed to screening methods for diabetes. Other factors that affect costs are the prevalence of risk factors among minority populations such as obesity, and changing demographics (ADA, 2013b). According to the American Diabetes Association (2014e) total per-capita health care expenditures were ($5,930) among the population of Hispanics in the year 2012. In contrast during the same year increased costs of care were incurred among non-Hispanic Blacks ($9,540) and their non-Hispanic White counterparts ($8,101). Non-Hispanic Blacks also had 75% more emergency department visits compared to their counterparts diagnosed with diabetes living in the U.S. (ADA, 2014e). In addition, per capita hospital inpatient costs were 41.3% higher among non-Hispanic Blacks than non-Hispanic Whites. In contrast, hospital inpatient costs were 25.8% lower among Hispanic counterparts than non-Hispanic Blacks (ADA, 2014e).

Health insurance coverage can help to curtail unnecessary dollars spent on health care to manage diabetes along with its potential health complications. Medical insurance is an extremely important factor that can enable people access to preventive and continuity of medical care for diabetes management. Most of the cost for diabetes care (62.4%) in the U.S is funded by government insurance (e.g. Medicare, Medicaid, military). The remainder expenditures are paid for by private insurance (34.4%) or by individuals who are uninsured (3.2%; ADA, 2014e). Additionally, people with diabetes who do not have health insurance have 55% more emergency department visits than people who carry health insurance. Such visits not covered by an insurance plan can place increased economic burden upon the healthcare system.
According to the United States Department Office of Minority Health (2012), in 2010, 44% of African-Americans used employer-sponsored health insurance compared to 62% of their non-Hispanic White counterparts who utilized similar health plans. Additionally, from data collected in 2010, 28% of African-Americans relied on Medicaid or public health insurance compared to 11% of the non-Hispanic White population who carried similar types of health insurance coverage. Finally, 20.8% of African-Americans were uninsured in contrast to 11.7% of non-Hispanic Whites without insurance plans (OMH, 2012). Compared to other populations it can be assumed that the percent of health insurance plans carried or lack of among African Americans diagnosed with diabetes could limit their ability and medical access to manage this chronic illness.

Lower health care expenditures have been associated with better glycemic control among people diagnosed with type 2 diabetes. Menzin et al. (2010) studied the association between glycemic control, diabetes related hospitalizations, and associated health care costs. Researchers examined the mean hemoglobin A1C values among subjects with type 2 diabetes. Subjects were also members of a managed care organization health plan. Study data demonstrated the odds of having at least one diabetes related hospitalization were not significantly associated with higher mean values less than or greater than 7%. However, the exception for hospital admissions was only related to A1C values greater than 10%. Menzin et al. (2010) explained that outcomes from this study were similar to previous research that showed evidence of subjects whose A1C values did improve resulted in lower medical care costs and fewer primary care visits.
Parallel to Menzin’s (2010) study, Shetty, Secnik, and Oglesby (2005) evaluated the relationship between glycemic control and diabetes related costs. Subjects in the study had a diagnosis of type 2 diabetes and were enrolled in a managed care organization plan. Subjects were assessed for management of their glycemic control. Two categories were created among subjects. One category targeted subjects with A1C values less than 7% (at-target value) and the second category targeted subjects with A1C values greater than 7% (above target value). Results from this study indicated subjects who ranged in ages from 31–40 years in the at-target A1C (<7%) group had significantly lower total diabetes costs compared to subjects older than 60 years among the same category. Subjects in the study with comorbidities of dyslipidemia, retinopathy, nephropathy, and neuropathy had significantly higher diabetes costs among both groups. An additional major difference revealed between the two groups was that obesity was a significant risk factor in determining elevated total diabetes medical care costs in the above target (A1C >7%) group, whereas it was not significant in the at-target (A1C <7%) group. Finally, study results demonstrated evidence of a strong relationship between glycemic control and diabetes related costs. Subjects in the at-target group had significantly lower diabetes medical care costs compared to subjects in the above target group.

In contrast to managed care organization health plans, government at the state level have the option to administer Medicaid coverage to lower income populations aligned with the Affordable Care Act of 2010. According to Decker, Kostova, Kenney, and Long (2013), uninsured low income adults with chronic conditions such as diabetes
do not have good disease care management. The study examined the prevalence of diabetes assessed from a physician diagnosis or laboratory hemoglobin A1C test values observed at 6.5% or less. Researchers found that more than one third of the uninsured adults had not visited a physician or other healthcare professional in the past year compared to only 8% of those who were currently enrolled in Medicaid with no medical visits. Study results revealed uninsured adults were less likely than Medicaid enrollees to have diabetes, hypertension, or increased cholesterol results. A reason for this study outcome suggests if uninsured individuals were not aware of their health status and had diabetes or another chronic condition the disease was more likely to be unmanaged or undiagnosed (Decker et al., 2013). The significance of these health conditions implied an increased risk of premature mortality among uninsured people. Such chronic health conditions can be prevented among individuals who do not access a usual source of medical care. Education is a crucial prevention strategy that can help to contain healthcare costs.

**Diabetes Self-Management Education**

Education is essential to utilize as strategy to increase awareness among people regarding prevention, screening, and self-management of chronic diseases like diabetes. This strategy can be particularly beneficial among populations where the disparity of diabetes exist. Funnell et al. (2008) described diabetes education as an effective strategy for improving clinical outcomes and quality of life, from a short-term perspective among individuals affected by this devastating disease. Researchers noted educational approaches or programming have demonstrated improved outcomes for people with
diabetes, incorporating behavioral and psychosocial strategies. Research (Funnell et al., 2008) showed that culturally age appropriate programs and group education was effective with improving outcomes among those affected by this condition.

The American Diabetes Association (2013a) has documented that education helps people with diabetes initiate effective self-management skills. Diabetes education can also infuse coping strategies needed among people who are initially diagnosed with diabetes. As a vital strategy education also can increase awareness of health complications from this devastating disease. Since there exist modifiable and inherent risk factors that cannot be modified by individuals to manage diabetes care it is essential to lower risk by educating people on how to modify unhealthy lifestyle practices such as physical inactivity and poor dietary behaviors.

Knowledge is an outcome measure for behavior that can be performed or practiced by individuals. As a result, knowledge can be translated into self-management behavior (Funnell et al., 2008). Long term self-management is critical strategy used to improve clinical diabetes outcomes, health status, and quality of life. The American Association of Diabetes Educators (2015b) and Funnell et al. (2008) described diabetes self-management education (DSME), also known as diabetes education, as a collaboration among health professionals that can assist people diagnosed with diabetes to attain proficient skills enabling them to change behaviors to help manage this chronic illness. This education process is also a partnership between individuals diagnosed with diabetes, caregivers or family members, and health professionals. By utilizing such a process people with diabetes are better able to cope under a variety of circumstances.
when challenged to make informed choices. Quality of life can be maximized for people with a diagnosis of diabetes. This is because DSME can optimize metabolic control, prevent and manage diabetes complications all in a cost-effective style. In perspective of a skill-based approach the American Diabetes Association (2013a) recommended that best practice for DSME should be focused on assisting people with diabetes to make informed self-management decisions.

In addition to screenings and monitoring diabetes the practice of diabetes self-management education (DSME) has been used by health professionals. The American Association of Diabetes Educators (AADE, 2015a) has described seven areas of care in the context of diabetes self-management including:

- Education to increase knowledge about appropriate food portion sizes, best times to eat and making healthy food choices are skills to self-manage diabetes.
- Overall fitness, attained through weight management and blood glucose control consistent with physical activity is essential. Education programming can help to accomplish such management goals.
- Daily self-monitoring of blood glucose levels increases peoples’ awareness of what necessary adjustments are needed regarding diet, physical activity and medications.
- Healthcare professionals can determine medications that should be taken by persons depending on their diabetes type.
- Attainment of problem solving skills for people with diabetes is an education strategy that can help them with making informed choices about food and medications under different circumstances.

- Learning to practice healthy behaviors such as smoking cessation, scheduling regular eye, foot and dental examinations can decrease complications from diabetes to optimize health and quality of life.

- Acquiring healthy coping skills help to manage psychological distress that can impact health and indirectly influence individuals’ motivation to keep their diabetes in control.

The construct of self-efficacy derived from Bandura’s Social Cognitive Theory (1986) is essential for self-management of diabetes with influencing and performing healthy behaviors. Importantly, self-efficacy can only enhance the self-management process.

**Construct of Self-Efficacy Defined and Influence On Health Behavior**

According to Bandura’s Social Cognitive Theory (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003), the construct of perceived self-efficacy can play a crucial role in the process of diabetes self-management and influence on health behaviors. Actions are influenced directly as well as cognitively, motivational, decisional, and affective determinants. Perceived self-efficacy defined by Bandura (1986) is people’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performance. The focus is on judgments of
what individuals are able to do with whatever skills they possess. Research (Bandura, 1986) has indicated that perceived self-efficacy mediates health behavior.

Efficacy beliefs influence goals and aspirations. Self-efficacy beliefs should be measured in context with challenges for successful performance. In assessing personal efficacy people can judge their self-efficacy for example to participate in regular physical activity in context with different challenges (e.g., work, tiredness). According to Bandura (2004), the stronger the perceived self-efficacy, the higher the goals people set for themselves. Their commitment to accomplish goals is strengthened. Self-efficacy beliefs form the outcome people expect their efforts to produce. Individuals with high efficacy expect to observe positive outcomes. Among individuals with high efficacy they continue on a path to accomplish goals during difficult experiences. In their efforts, people with high self-efficacy view difficult circumstances as improvement of self-management’s skills (Bandura, 2004). People who perceive themselves with increased efficacy consider themselves capable of overcoming negative health behaviors (e.g., high fat diet; Bandura, 1986).

People with low efficacy expect their efforts to bring unfavorable outcomes (Bandura, 2004). Among such individuals with low self-efficacy they easily give up trying during difficult circumstances. They become convinced that their efforts are useless. Self-efficacy beliefs also determine how obstacles are viewed under complicated conditions (Bandura, 2004).

According to the research of Bandura (1986), self-efficacy is based on four principle sources of information:
- Enactive attainment encompasses a strong sense of self-efficacy developed through repeated successes (Bandura, 1986). Failure can raise confidence that better strategies will bring future successes. After a strong belief of self-efficacy is cultivated through repeated successes, occasional failures are most likely to have little to no effect on the judgment of an individual’s capabilities. Through their experiences people with strong self-efficacy are able to persevere even in the most difficult situations.

- Vicarious experience as another source of self-efficacy information is defined as the observance of a task performed successfully by people similar in nature to the observer (Bandura, 1986). Consequently, the observer too can possess capabilities to master comparable activities. A successful performance thus, can increase self-perceptions of efficacy in observers. People persuade themselves that if those being observed can perform a specific task they too should be able to achieve at least some improvement in performance.

- Verbal persuasion is a third self-efficacy informational source. Particularly, this source is used to talk people into believing they can acquire capabilities that will enable them to achieve a specific task (Bandura, 1986). People who are persuaded verbally that they possess the capability to master an assignment are likely to execute more of an effort to attain a goal. The intent of this information source is to direct the individual’s focus away from self-doubts or personal deficiency when difficult situations develop. This process can promote development of skills and a sense of personal efficacy.
Verbal persuasion has its greatest effect upon people who have some reason to believe that they can produce favorable effects from their actions.

- Lastly, the physiological informational source is defined in the context in which people are more inclined to expect success when they are not faced with adverse circumstances (Bandura, 1986). Stressful circumstances create conditions of vulnerability or dysfunction in which performing a task can become more difficult. Thoughts of fear for example can provoke people to levels of personal dysfunction to perform a task unsuccessfully. As a general rule in regard to the physiological state, treatments focused on reducing emotional arousal of threats are utilized to increase perceived self-efficacy and improve performance to accomplish a task/s.

**Self-Efficacy Influence on Diabetes and Self-Management Behaviors**

It is believed by some scholars that improved patient self-efficacy is a critical pathway to improved self-management of diabetes. Self-efficacy was the theoretical basis for a diabetes study conducted by Sarkar, Fisher, and Schillinger (2006). Researchers proposed that patients who were confident in their ability to perform a specific health behavior could successively influence which self-management behaviors they would engage in and how to follow a prescribed diabetes regimen. Patient activities included confidence in ability to maintain a healthy diet, exercise (20 min/day), self-monitoring blood glucose levels, foot care which included examining feet for cuts and or sores, insulin care, and medication regimen. Subjects were selected from a primary care clinic at San Francisco General Hospital who had been diagnosed with type
2 diabetes. Study subjects included were ethnically diverse among Asian Pacific Islanders, African-Americans, Hispanics, and White non-Hispanic adults.

Study outcomes revealed a mean self-efficacy score of 74 for the overall sample, with a standard deviation of 18. The mean self-efficacy score indicated no significant difference across race or ethnicity. However, patients with higher self-efficacy scores were more likely to report optimal diet, exercise, self-monitoring of blood glucose levels, insulin care but not medication adherence. Additionally, outcomes of the study revealed evidence that self-efficacy was significantly associated with diet, exercise, self-monitoring blood glucose levels and foot care.

In addition, Sarkar et al. (2006) correlated that among selected patients, self-efficacy demonstrated the significance for appropriate self-management for many chronic health conditions. Researchers suggested that self-efficacy constituted a useful intervention to target vulnerable populations. Interventions in this instance must address self-efficacy within the context of the subject’s environment. Applicability of self-efficacy research among ethnically diverse patients with diabetes can be useful in decreasing diabetes disparity among minority populations (Sarkar et al., 2006), and is relevant for improving diabetes self-management behaviors.

Judgments of efficacy are specific to certain behaviors, settings, and people’s capabilities to organize and execute courses of action required to meet given situational demands. In this context research has been conducted that focused on self-efficacy beliefs and judgment based on at least one of four information sources described by Bandura (1986). Hurley and Shea (1992) examined the informational source enactive
attainment with diabetes. Self-efficacy was proposed in this study as confidence in the ability to perform a task or behavior. The construct of self-efficacy was utilized to determine which behaviors people will engage in, how long they will persist in performing the behavior, and how much effort they will make to achieve their goal. The study was conducted among subjects selected from a large diabetes center undergoing treatment for this chronic condition. Diabetes educators were encouraged to incorporate the self-efficacy concept into teaching programs to help individuals develop their own strategies for long-term management of their diabetes. Study subjects were required to be free of serious debilitating co-morbid conditions such as neuropathy or cardiovascular problems. Self-efficacy in regard to this study was represented by specific behaviors of diet and exercise management. These health behaviors were identified as successful predictors of related self-management activities.

Study outcomes revealed individuals with higher levels of self-efficacy were better able to manage their diabetes self-care. To be successful individuals have to be goal directed and persistent. Hence, the relationship between self-efficacy and sustained diabetes regimen can evolve. Importantly, evidence from this study demonstrated the application of enactive attainment as an information source to a diabetes education program can enhance self-efficacy and diabetes self-management (Hurley & Shea, 1992).

The construct of self-efficacy particularly can be utilized to modify and manage health behaviors such as physical activity among populations affected by diabetes. Komar-Samardzija, Braun, Keithley, and Quinn (2012) brought this to light in their analysis of self-efficacy and self-management behaviors by integrating the four
informational sources of enactive attainment, vicarious experience, verbal persuasion, and physiologic state into their study design. The researchers examined the relationship between the frequency of physical activity, reduced calorie intake and self-efficacy among African American women diagnosed with type 2 diabetes. Female subjects were recruited from a diabetes center. Study subjects received diabetes education facilitated by a certified diabetes educator according to American Diabetes Association guidelines.

Outcomes from the study by Komar-Samardzija et al. (2012) revealed that self-efficacy was positively related to physical activity. In addition, greater degrees of self-efficacy were reported for physical activity frequency as well as increased caloric depletion associated with physical activity. These outcomes confirmed data that self-efficacy was an important predictor of physical activity levels as well as, attainment of reduced calorie intake among African American females diagnosed with type 2 diabetes.

Research confirms that people can perform tasks better when they feel they are capable of doing well. The expectancy of confidence in favorable outcomes has been implied by researchers aligned with the construct of self-efficacy. The purpose of the study conducted by Skelly, Marshall, Haughey, Davis, and Dunford (1995) was to assess the influence and perceptions of self-efficacy and confidence in outcomes related to a diabetes self-care regimen among African American women. Eligibility for the study were African American women who ranged in age from 57 years old or more and were diagnosed with diabetes. These women received care from three diabetes outpatient clinics in a large New York hospital. The specific self-care behaviors examined were
home glucose and urine testing, diet, medication administration (insulin), and exercise. Analysis from this study demonstrated self-efficacy had its greatest influence on diet and physical activity.

Analogous to Skelly et al. (1995), a study conducted by Hunt et al. (2012) focused on the capability of individuals to organize and perform actions required to attain specific types of health behaviors. Researchers studied self-efficacy beliefs focused on self-management behaviors of people with type 2 diabetes. According to Hunt et al., individuals with increased self-efficacy levels expected success in attaining their goals. On the other hand, people with lower self-efficacy levels were uncertain of their ability to reach intended behavior goals. Stronger self-efficacy beliefs were positively related to participation in diabetes self-management behaviors.

Subjects in the study conducted by Hunt et al. (2012) were selected from three physician offices located in rural counties in Alabama. Most subjects were African-American females who had been living with diabetes for 10 years or less. Ages of these women ranged from 19 years to 81 years. Diabetes self-management behaviors assessed in this study included physical activity, healthy eating, taking medications such as insulin, self-monitoring of blood glucose levels, problem solving of blood glucose fluctuations, reducing risk of complications, and psychosocial adaption. Improvements in glycemic control, blood pressure, cholesterol, and quality-of-life were associated with participation in self-management behaviors.

Study outcomes revealed self-efficacy was associated significantly with diabetes self-management. In addition, study findings indicated that people living with type 2
diabetes mellitus with higher levels of self-efficacy participated in diabetes self-management behaviors more often. Self-efficacy was strongly associated with diabetes self-management emphasizing self-efficacy as an important intervention target for people living with type 2 diabetes mellitus.

According to Mishali, Omar, and Heyman (2011), self-efficacy has been demonstrated to be essential in the self-management of diabetes. Mishali et al. assessed how self-efficacy can be used to predict intention to change and interventions directed towards increasing self-care. Self-efficacy has been correlated with physical activity, diet and associated with hemoglobin A1C levels. Mishali et al. explained that although patients understood that maintaining a healthy diet and increased physical activity can improve their well-being they can fail to change their behavior. Study outcomes reflected higher resistance to treatment was significantly correlated with lower self-efficacy of patients. Lower self-efficacy in each of the outcomes measured demonstrated that behaviors were related to decreased adherence to a specific behavior with the exception of medication adherence. The measurement of self-efficacy as a diagnostic tool for patients with diabetes can provide healthcare professionals with necessary information about readiness of patients to engage in behavioral change (Mishali et al., 2011).

**Faith and Church Based Organizations and Self Efficacy Influence on Diabetes**

Noteworthy, according to the research of Davis, Goldmon, and Coker-Appiah (2011), evidence has revealed that when the construct of self-efficacy is incorporated into faith-based health education programs this can increase the likelihood that individuals will attempt to perform certain self-management behaviors. Self-efficacy informational
sources have been found to enhance self-efficacy such as performance accomplishments and vicarious learning.

Warren and Charles (2011) described faith-based organizations as institutions founded by religious congregations, religiously motivated incorporators, or board members. These types of organizations generally maintain a faith-based mission. Participation in these organizations is not necessarily restricted to those who adhere to that specific faith. Services delivered by faith-based associations may or may not have faith-based content. Faith-based organizations are comprised of health ministries. The purpose of these ministries is to engage, educate and empower people of faith to create healthier communities. Faith-based organizations stress wellness, health promotion and disease prevention (Warren et al. 2011).

According to Davis et al. (2011), African American churches are types of faith-based institutions that have been recognized as sources of African-American culture and manner of life. Cultivated within this environment are aspects of African-American identity. Faith-based environments have offered African Americans refuge from racism and strengthened congregants’ faith in justice. Additionally, faith-based institutions have addressed this population’s economic, educational, and health needs.

Research evidence by Davis et al. (2011) suggested multiple health benefits are associated with church involvement among African-Americans. These health benefits encompass but, not inclusive are improved health behaviors, utilization of healthcare services, reduction in mortality risks, and improved health status (Davis et al., 2011). The focus of the study conducted by Davis et al. was to develop an obesity intervention
program for children who ranged from 6 to 11 years of age. African-American children from a church Sunday School were selected as subjects for a community-based participatory research study conducted by Davis et al. This church-based health education intervention explored current diet, physical activity behaviors and body image among this group of study subjects.

Study results demonstrated that children who participated in the intervention reported aspirations to learn about healthy eating and healthier food options, become physically active, and feel good about themselves (Davis et al. 2011). In context with the study associated church leaders and parents of study subjects viewed the program as positive and highlighted how a faith-based obesity program aligned with the mission of the church. This type of intervention reflected how churches can increase their capacity to build and deliver obesity related health topics in context with biblical messages. Consequently, increased program affect and sustainability can be attained in a faith-based institution.

In the research of Summers et al. (2013), Healthy Body Healthy Souls, a church-based diabetes prevention program, through integration of formative research and participatory workshops, was developed as an appropriate faith-based intervention to modify diet and physical activity. The environment of church community was used to improve knowledge and skills of participating church members. By using this approach researchers were able to address barriers of mistrust among the community. Utilization of this type of environment helped ensure issues being addressed were relevant to the
community through engagement and open communication during the intervention process.

Analogous with Healthy Body Healthy Souls, the American Diabetes Association (2014f) program known as Project Power is an African American faith-based diabetes awareness program. It uses workshops to teach congregations about diabetes awareness and management through lifestyle changes. Project power is focused on individual behavior change. The study design by Summers et al. (2013) was aimed to assess whether the combined church based interventions Healthy Body Healthy Souls and Project Power could improve program outcome measures.

Healthy Bodies Healthy Souls was a randomized controlled study conducted by Summers et al. (2013) with nine churches assigned to one of three groups. Group 1 received combined environmental intervention plus Project Power. Group 2 received only Project Power. Group 3 served as the control group and received Project Power following the intervention groups. Intervention was delivered in five phases. This involved education about healthy beverages, healthy desserts, and healthy home cooking. Contacts for study subjects were identified within the church membership and volunteered to be gatekeepers. A spiritual theme was maintained throughout the intervention. Materials incorporated a bible verse, hymn, or other spiritual message to coincide with targeted behavior changes. Then, church congregants generated lists for healthy foods, on how to prepare healthy meals, serve, eat and control food portions which were all associated with change in behaviors. Subjects also were asked about
ways to increase physical activities for themselves, parents, and children. Taste testing, testimonials, recipe cards, and giveaways were incorporated as intervention components.

The intervention was designed to highlight self-efficacy knowledge, behavioral intentions, and outcome expectations to improve potential sustainability of positive outcomes. Study results from the tailored lifestyle intervention demonstrated a more positive influence among the membership from small churches compared to congregants from large churches. Reasons suggested for this outcome could be attributed to other competing programs that occurred in larger churches. Smaller churches (less than 100 members) reported outcomes that included activities of garden fruit and vegetables served at church events and educational materials that also were created. This participatory intervention approach was used for integrating formative research, planning workshops, and ongoing collaboration to design culturally appropriate and potentially viable diabetes prevention programming in urban African-American churches (Summers et al., 2013).

Another study that assessed diabetes self-efficacy was conducted by Faridi et al. (2010) among New Haven and Bridgeport African-American faith-based organizations. The intent of the study was to demonstrate the effect of a community-based participatory intervention dedicated to enhance lifestyle practices involving physical activity, healthy eating, self-efficacy, and diabetes knowledge. Diabetes prevention program lifestyle strategies were implemented to reduce incidence of diabetes.

As part of the study design, a community health advisor met with study subjects (Faridi et al., 2010). A total of 133 subjects from intervention churches in New Haven
and 125 subjects from control churches in Bridgeport were recruited for the study. Intervention education sessions conducted among subjects were led by a certified diabetes educator and facilitated by members of the research team. Major topics included learning about physical activity, eating a healthy diet, and reading food labels. Other topics consisted of portion control, healthy cooking, weight loss, diabetes medications, and empowering subjects to communicate effectively with physicians. Participating church congregation members were also asked to complete several surveys to measure baseline diabetes prevention knowledge, physical activity, dietary patterns, nutrition, and physical self-efficacy.

New Haven, Connecticut, church congregants received a one-year intervention. The diabetes prevention intervention was compared to church congregants in Bridgeport, Connecticut, who did not receive an intervention. Study outcomes measured physical activity, dietary pattern, anthropometric measures, social support, diabetes knowledge, and lastly nutrition and exercise self-efficacy. Results of this study indicated no statistical significance between group improvements (Faridi et al., 2010). Additionally, outcomes showed no evidence of any significant change when the intervention and control sites were compared among measured variables of body weight, overall social support, diabetic knowledge, physical activity self-efficacy, and physical activity level. However, within group analysis demonstrated that the control group revealed statistically significant change in nutrition self-efficacy ($p = 0.0485$; Faridi et al., 2010). Physical activity self-efficacy, nutrition self-efficacy, and energy expenditure were comparable ($p > 0.05$; Faridi et al., 2010).
In an effort to address individuals with type 2 diabetes, community health interventions that incorporate diabetes self-management education (DSME) can decrease the devastating influence diabetes mellitus has on the health of millions of Americans. This can be especially beneficial among minority populations’ most affected disproportionately. According to the Community Preventive Services Task Force (The Guide to Community Preventive Services, [TGCPS], 2013), diabetes self-management education (DSME) interventions are recommended for glycemic control improvement. Promotion of physically active lifestyles, also a component of DSME, is a critical factor for improving national health outcomes associated with reducing the risk of chronic conditions such as diabetes. Traditional exercise programs and specifically individually focused health approaches have been insufficient in an effort to engage minority populations and women in consistent physical activity (Peterson & Atwood, 2002). It is important to understand these DSME interventions are not meant to substitute education delivered in the clinical setting. Such health interventions can be successful in community gathering places for adults diagnosed with type 2 diabetes.

Community gathering places have been used as venues for DSME because traditional clinical settings may not be best environment to address DSME with adults (TGCPS, 2013). Among various community health interventions, DSME should be provided to people 18 years of age or older in settings other than homes, clinics, schools, or worksites. The task force documented that education in the home setting is conducive only to individual or family teaching. On the other hand, education at worksites cannot
reach those who do not work outside the home. Alternative intervention venues not inclusive are community centers and faith-based institutions.
CHAPTER III
METHODOLOGY

The purpose of this study was to analyze the influence of education programming type, scope of diabetes self-management education received, and selected demographics on self-efficacy among adult African Americans with type 2 diabetes. Analyses for this study were guided by three primary research questions. Subsequent questions were conditioned on the findings from analyses of each foundational research question.

1. Is there a difference in the level of self-efficacy between adults, particularly African Americans with type 2 diabetes, who participated in a faith-based diabetes education program as compared to those who did not?
   1a. If yes, is attending a faith-based program a predictor of self-efficacy, after adjusting for selected demographic variables?

2. Is there a difference in diabetes self-management education, including diet, physical activity, and glucose monitoring, among adults, particularly African American patients diagnosed with type 2 diabetes, who attended faith-based diabetes education programs as compared to those who did not?
   2a. If yes, is attending faith-based diabetes education programs a predictor of diabetes self-management education, after adjusting for selected demographics?

3. Is there a relationship between self-efficacy and diabetes self-management education among adults, particularly African American patients diagnosed with type 2 diabetes?
3a. If yes, is this relationship the same for those who attended faith-based diabetes education programs as compared to those who did not?

**Study Subjects**

Research has documented that African Americans disproportionately are affected by type 2 diabetes (ADA, 2015c; OMH, 2012). To support this, a study conducted by Peterson and Atwood (2002) revealed that minorities, older adults, people of lower socioeconomic status, and individuals with limited education, in particular, have demonstrated less active lifestyles, a demonstrated risk for type 2 diabetes. Adults living in Ohio, particularly African Americans, have an increased prevalence of diabetes (17.2%) when compared to their White counterparts (9.2%; CDC, 2010b). Cultural attitudes, family history, and behaviors among African Americans have been linked to this increased risk of being diagnosed with diabetes. In particular, physical inactivity, unhealthy diets, and the associated elevated incidence of overweight and obesity are documented to be represented in this population (Newman Geiger et al., 2008). In this context, the Community Health Needs Assessment report (Summa Health Systems, 2013), developed in collaboration by the College of Public Health at Kent State University, Akron Children’s Hospital, Akron General Health System, and Summa Health System, noted evidence of associated risks for diabetes mellitus among people living in a five county area (Summit, Portage, Medina, Stark, Wayne) of northeast Ohio. Specifically, this report confirmed that many adults living in this region of Ohio, the area from which study subjects were drawn, were overweight or obese.
Fortunately, many adult African Americans living in northeast Ohio affected by type 2 diabetes have access to a range of enriching and supportive diabetes education programming in their local communities. In this context, faith-based organizations provide organized activities during which enriching information is shared and opportunities to practice critical self-management skills for adults diagnosed with type 2 diabetes are formalized. As a result, those who participate in such health education and promotion programs are supported in their management of this chronic condition. In particular, faith-based organizations (FBO) are accessible and often serve as a trusted resource providing timely and tailored self-management education activities to meet the needs of this population. Importantly, African American faith-based groups and leaders have recognized health issues of concern such as physical inactivity and poor nutrition among this population. As a result constituents diagnosed with such health issues who have participated in FBO education programming have confirmed that they received increased levels of satisfaction from spiritual and group educational program components (Yeary et al., 2011). Such program components have been demonstrated to provide a culturally sensitive approach when addressing associated health issues where the disparity incidence of diabetes is present. Evidence has confirmed that individuals can be motivated to participate in programming that enables them to achieve positive health behavior outcomes. By drawing on faith and support from social interactions among peers with similar health issues in context with faith-based education programming participants are likely to achieve such outcomes (Yeary et al., 2011). Further, faith-based engagement continues to play the role of vital community partner for health education.
and promotion programming. In particular, community partners can be essential for successful recruitment of subjects and for the dissemination of health related information about such conditions as diabetes mellitus (Davis et al., 2011; Hoyo et al., 2004).

Based on study research questions as a foundation, a convenience sampling method was used for data collection. A sample size of 200 was proposed, 100 from each of two study groups. Since the study involved two groups (clinic and FBO) for comparison, a similar number of subjects from each study group was expected. In specific, the researcher collected data in the clinic group from subjects who visited two ambulatory clinics. Adult subjects, aged 20 years of age and older with a diagnosis of type 2 diabetes, were recruited from these clinic sites. Specifically, the recruitment sites were affiliated with a level I trauma health facility located in northeast Ohio. At the time of data collection, both clinics hosted a diverse population of patients including African-American, non-Hispanic Whites, and Hispanic adults who were included in the subject pool to reach the overall proposed sample size of 100 in this group.

Permission to conduct the study at the health facility was requested and received from the Kent State University Office of Research Compliance in April 2014 (Appendix A). Specifically, there was a master IRB Collaboration Agreement between the Kent State University Research and Compliance office and the research office of the health institution. As a result of the agreement, Kent State was recognized as the IRB of record in order to conduct the study at the ambulatory sites. Additionally, letters of support to conduct the study at the health facility were requested and received from the system Vice President of Medical Education and Chief Academic Officer along with the system Vice
President of Community Benefit and Diversity (Appendix B). Practice managers at both
clinics were then contacted via phone call, e-mail, or face-to-face encounter by the
researcher in order to confirm their support for and cooperation with her to administer the
instrument among subjects at each ambulatory clinic. Engaging with the practice
managers provided the opportunity for the researcher to introduce herself, explain the
purpose of the study, explain the need to gain access to the clinic sample, and share the
instrument with the practice managers that would be administered among patient
subjects.

The clinics are supported by an interdisciplinary professional health care staff. To
enrich fidelity of the data collection process, the researcher was introduced to staff by the
practice managers during either a staff morning or afternoon report briefing or while
employees had a brief break in performing duties. The health care team was comprised
of contracted physicians, physician residents, nurses, medical assistants, social workers,
and medical students who treat patients for their specific health needs.

In addition, data collection by the researcher in the FBO group for this study
targeted adults diagnosed with type 2 diabetes who were recruited from six faith-based
programs located in northeast Ohio. Permission to conduct the study at these locations
was granted by the Kent State University Office of Research Compliance in April 2014
(Appendix A). Letters of support from a program staff member at the site with their
respective contact information were necessary documentation for permission.
Subsequently, letters of support were requested and received from either the FBO’s
pastor or program coordinator (Appendix C). Program coordinators were contacted via
phone or e-mail to request permission to administer the instrument among program subjects during the occurrence of program activities. Subjects in the FBO programs were of diverse ethnic backgrounds comprised of primarily African Americans. Of interest was the fact that from which subjects was drawn was one founded by an individual whose daughter had died from diabetes complications.

Newly screened, those diagnosed with type 2 diabetes for more than a year, and returning attendees all were permitted to participate as subjects in the faith-based programs. The program sessions were conducted weekly, bi-monthly, or monthly. Most often, such program sessions were conducted at the church location. Typically, programs occurred on weekdays or on Sundays after the worship service. There were occasions when programming could occur at an affiliated community health facility or at events such as health fairs focused on addressing health disparities in the community.

Among subjects in this group, data were collected in context of a range of activities consistent with the larger mission of the FBO. On occasion, biblical teachings or specific scriptures related to the mind, body, and spirit were provided by church pastors or leaders as components of the education programming sponsored by the faith-based organizations. On other occasions, physicians, nurses, dieticians, and other health professionals from the community provided enrichment for subjects. Some program pastors or coordinators used their professional alliances or community networks as a method to engage local health professionals to render their services free of charge to support program education. Other health professionals who participated were members of the sponsoring FBO. Also, screening and assessments were conducted for subjects by
a program healthcare professional at some of the sites. Trained congregation members at some of the sites assisted by conducting some of the educational sessions. To help monitor program efficacy and individual management capacity such screenings as those for hemoglobin A1C, waist circumference, blood pressure, or, blood glucose check were performed at some locations. Finally, two of the faith-based recruitment sites collaborated with their local food banks to provide program attendees with free and healthier food items. Clothing items donated by community members were additional resources offered to subjects at selected sites. Finally, at all of the FBO locations program attendees could receive education about broader health issues, which included diabetes mellitus, health screenings, and a healthy meal.

**Pilot Study**

To establish a foundation for this study, a pilot study was conducted between October and December 2013. This study began after IRB approval was granted. The purpose of this pilot was to collect data from a small pool of adults, particularly African American, diagnosed with type 2 diabetes who were participating in activities provided by a faith-based organization. As such, the pilot study was designed to test the instrument and the data collection protocol. In specific, the pilot study was conducted to evaluate confidence about diabetes type 2 self-management behaviors among subjects. Modified versions (4-point Likert) of the self-efficacy 5-point symmetric and asymmetric Likert scale that were originally developed by van der Bijl and Shortridge-Baggett (2001) were used in the pilot instrument. Both modified 4-point Likert symmetric and asymmetric pencil and paper instrument versions were used for the pilot study to examine
any differences in responses and data collected among the targeted study subjects
(Appendices D & E). IRB approval to conduct the pilot study was granted in October
2013 by the Kent State University Office of Research Compliance (Appendix F).

**Pilot Study Data Collection Process**

With respect to the pilot, once IRB approval was received, initial contact was
made via telephone and e-mail with the respective organization’s certified nutritionist and
Supervisor-System of Care staff member. In this manner, contact was made to seek
permission to administer the instrument among program subjects participating in the
programs sponsored by two faith-based organizations (FBO) in northeast Ohio. Once
approval was received from the certified nutritionist to attend organization activities the
researcher made several visits to the community center where activities were offered.
During the first 2 visits, the researcher observed the format of activities to conduct the
study. In addition, observation helped the researcher learn the most appropriate times to
approach attendees to gauge their willingness to participate in the pilot.

At this center, different forms of physical activity programming were offered one
time each week. To enhance exercise activities, the certified nutritionist conducted
monthly and concurrent healthy eating and recipe demonstrations concurrently during the
exercise activities. Most people who participated in the physical activities had an
opportunity to attend the health eating demonstrations before or after their participation in
physical activities.

The second FBO recruitment site for the pilot study provided social services to
the residents of several neighborhoods in the region. Services provided by this
organization include a once-monthly nutritional dinner hosted by a local faith-based organization. Such, dinners are served during 2-hour increments.

With respect to ethnicity and socioeconomic status, a diverse population of people visited both sites during data collection periods for the pilot study. On average, approximately 50 people attended activities at both sites. The nutritionist and Supervisor-System of Care staff member from the respective sites explained that activities were attended by adults who could or could not have a diagnosis of type 2 diabetes. Criteria indicated that in order to participate in the study subjects must have a diagnosis of type 2 diabetes and be 20 years of age and older. A total of 20 respondents from combined sites met the pilot study criteria.

**Data Collection for Pilot Study**

Collection of data by the researcher involved several steps to ensure that instruments were administered to subjects who had granted their permission to participate during the specified program timeframe. Adults who visited both sites were approached either before or after activities by the researcher. Each encounter between the researcher and subject included the following steps:

- The researcher explained that a study was being conducted by a Kent State University graduate student from a script (Appendix G).
- Subjects also were told the study would enable the student to learn about how people diagnosed with type 2 diabetes manage their care.
- After the study was clarified by the researcher to potential subjects attending the activities, adults who identified themselves as having a diagnosis of type 2
diabetes were asked to voluntarily respond to the self-administered instrument.

- Study subjects who agreed to participate were asked to read and sign a consent form (see Appendix H) prior to responding to the instrument (The consent form explained the pilot study purpose and that the individual could discontinue their participation at any time without loss of benefits from the organization).

- Once the consent form was signed individuals were randomly given either the symmetric or asymmetric version of the instrument to complete (Appendices D & E).

- A copy of the consent form was also given to each subject for future reference prior to completing the instrument.

- Individuals were instructed by the researcher that the instrument would take 20 minutes or less to complete.

- Subjects were told their responses would remain confidential and there was no identifying information to associate them to their instrument.

**Findings from the Pilot Study**

Data collected during the pilot study were analyzed using SPSS version 22 statistical software. Descriptive statistics revealed information related to subject demographics (Table 1). In this context, subjects who participated in this pilot included 80% (16) males and 20% (4) females. With respect to ethnicity and race 85% (17) of the subjects described themselves as African-American/Black, whereas 10% (2) identified as
White Caucasian, and 5% (1) indicated being Latino. Among subjects 15% (3)
self-reported their age as 20 years but less than 40 years old, 30% (6) indicated being 40
to 60 years of age, and 65% (7) specified their ages between 60 and 80 years of age
(Table 1).

The majority, 40% (8), of subjects designated their income between the ranges of
$20,000 to $40,000 (Table 1). Others, 30% (6) self-reported income as less than $20,000,
and 25% (5) specified incomes between $40,000 and $60,000. With respect to health
insurance represented among the pilot sample, 45% (9) of the subjects indicated having
private coverage. In addition, public and other health insurance were represented by 20%
(4) of the sample, whereas having no health insurance was represented among 10% (2) of
the subjects who responded.

Other demographic information denoted subject’s marital status. The majority of
individuals were single, 12 (60%), whereas others reported being divorced, 5 (25%), or
married, 5 (15%). Also, findings revealed that 40% (8) of the subjects had completed
some college education. At least 10% (2) received some high school education and 35%
(7) were high school graduates or had obtained a GED (Table 1).

With respect to specific diabetes mellitus information (see Table 2), 19 (95%) of
the individuals who participated in the pilot study had been diagnosed with type 2
diabetes for more than a year, whereas 1 (5%) reported being diagnosed less than a year.
Finally, 90% of the pilot study subjects reported taking their prescribed diabetes
medication most of the time and 15 (75%) and 3 (15%) individuals indicated taking
prescribed medications some of the time.
Table 1

*Pilot Study Demographic Characteristics*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16 (80%)</td>
</tr>
<tr>
<td>Female</td>
<td>4 (20%)</td>
</tr>
<tr>
<td><strong>Ethnicity/Race</strong></td>
<td></td>
</tr>
<tr>
<td>African American/Black</td>
<td>17 (85%)</td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>Latino</td>
<td>1 (5%)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>20 years and less than 40</td>
<td>3 (15%)</td>
</tr>
<tr>
<td>40 to 60</td>
<td>6 (30%)</td>
</tr>
<tr>
<td>60 to 80</td>
<td>7 (65%)</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>6 (30%)</td>
</tr>
<tr>
<td>$20,000 to $40,000</td>
<td>8 (40%)</td>
</tr>
<tr>
<td>$40,000 to $60,000</td>
<td>5 (25%)</td>
</tr>
<tr>
<td><strong>Insurance type</strong></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>9 (45%)</td>
</tr>
<tr>
<td>Public</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>None</td>
<td>2 (10%)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>12 (60%)</td>
</tr>
<tr>
<td>Divorced</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>Married</td>
<td>3 (15%)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>Some high school</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>High school graduate or GED</td>
<td>7 (35%)</td>
</tr>
<tr>
<td>Some college</td>
<td>8 (40%)</td>
</tr>
<tr>
<td>College graduate</td>
<td>3 (15%)</td>
</tr>
</tbody>
</table>
### Table 2

*Pilot Study Diabetes Diagnosis and Medical Care Frequencies*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length of type 2 diabetes diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Greater than 1 year</td>
<td>19 (95%)</td>
</tr>
<tr>
<td><strong>Medication compliance</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15 (75%)</td>
</tr>
<tr>
<td>Some of the time</td>
<td>3 (15%)</td>
</tr>
<tr>
<td><strong>Clinician visit(s)</strong></td>
<td></td>
</tr>
<tr>
<td>More than once a month</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>3-4 times per year</td>
<td>7 (35%)</td>
</tr>
<tr>
<td>1-2 times per year</td>
<td>5 (25%)</td>
</tr>
<tr>
<td>Not visited doctor(s) in the last 12 months</td>
<td>3 (15%)</td>
</tr>
</tbody>
</table>

Analysis of the diabetes self-management education (see Table 3) revealed that the majority, 7 (35%), of subjects had visited their clinician or a medical professional 3 to 4 times per year. Other responses specified 5 (25%) subjects either visited their medical provider monthly or at least 1 to 2 times per year and 3 (15%) had not visited a clinician in the last 12 months. In addition, individuals did receive some form of diabetes education (e.g., exercise, diet, glucose monitoring) from their medical care provider (Table 3). Data collected with respect to the self-efficacy section of the instrument (Table 3) revealed the majority of subjects were confident about situations and/or tasks they performed associated with their self-management behaviors.
Table 3

*Dependent Variable Estimates*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Estimates N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes Self-Management Education</td>
<td>19 (95%)</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>19 (95%)</td>
</tr>
</tbody>
</table>

Notably, based on the pilot study, it was revealed that respondents did not complete all of the self-efficacy items in the instrument. These items were placed as the last component on the pilot instrument. Importantly, since self-efficacy was a critical theoretical construct in this study, such items were all placed as the second component of items in the final instrument (Appendices I—clinic subject pool group & J—FBO subject pool group). It was anticipated that moving the self-efficacy items earlier in the instrument would help to increase the collection of more complete self-efficacy data in the final study. Additionally in the pilot, data collection occurred at the FBO sites.

Importantly, observation of the flow of activities and administration of the instrument at the pilot sites by researcher helped inform data collection protocol among subjects in the final study in context of these findings. To facilitate the distinction between data collected in the final study among the clinic and FBO sites color-coded instruments were used at each site. In this manner, data analyses could be better managed.
Particularly, findings from the pilot also helped to inform the manner in which data analyses were performed in the final study. In this fashion, regression analysis was conducted to test Hypotheses 1a and 2a as indicated by data represented in Tables 2 and 3. As such, all cases were included in the final study without sorting by years of diagnosis or receiving treatment among the data collected. Findings from the pilot study revealed the majority of subjects had a diagnosis of type 2 for more than one year. Most subjects indicated also they had visited a medical provider and were taking medications for management of their diabetes. Such findings from the pilot also were similarly found in the final data collected among subjects.

**Study Introduction**

One noteworthy finding revealed by the pilot study was that subjects reported that they had not ever been involved in faith-based education programming. Interestingly, subjects reported such findings during periods when they participated in activities that occurred at the FBO sponsored data collection site. It could be suggested that these particular findings were a result of the unawareness or lack of recognition by subjects that activities were sponsored by the FBO. Another suggestion for the lack of recognition by subjects of FBO sponsored activities is they did not want to admit their involvement with a FBO program. Since recognition among subjects who did participate in a faith-based diabetes education programs was critical to this study, the final instrument item was modified. The modified item was constructed to examine if subjects recognized activities they participated in at the site were known as a faith-based or church-based program.
**Study Instrumentation**

As confirmed by pilot study findings, three major constructs were measured for the purpose of this study. One construct involved type of education programming received, which included faith-based programs compared to health care providers in clinical settings. Two other construct items that were measured encompassed type of diabetes self-management education received, and perceived self-efficacy levels. Additionally, basic demographic information was assessed as a final component of the study.

The “Diabetes Management Self-Efficacy Scale,” a 5-point Likert scale developed at the University of Utrecht by van der Bijl and Shortridge-Baggett (2001) was used in this study to measure the construct of self-efficacy, items 1 through 20 (Appendices K & L original scales). Permission and approval to use the scale was requested and received from researchers who developed it (Appendix M). In the past, this scale has been administered among populations with a diagnosis of type 2 diabetes living in the Netherlands and United States. The scale has been focused on measuring the degree of confidence that subjects have about their diabetes self-management behaviors (van der Bijl & Shortridge-Baggett, 2001). To measure this specific construct, researchers used the “strength” dimension of self-efficacy to develop items. Van der Bijl and Shortridge-Baggett have explained that this specific dimension of self-efficacy is most influential when measuring diabetes self-management behaviors among individuals who are newly diagnosed with diabetes mellitus. Upon further analysis of the instrument, researchers also incorporated the “magnitude” dimension of self-efficacy. Among people
who have a history of diabetes, this specific dimension of self-efficacy can help reveal the degree of difficulty a subject has when performing a particular task. A total of 20 items comprise this self-efficacy scale. The items address self-management behaviors focused on performing tasks, which included glucose monitoring, diet, medication intake and physical activity.

In respect to responses to the 20-item instrument van der Bijl and Shortridge-Baggett (2001) developed two versions. Their initial version was identified as a 5-point Likert “symmetric” rating scale, which included (Appendix K):

- “Definitely yes”
- “Probably yes”
- “Maybe yes, maybe no”
- “Probably not”
- “Definitely not”

Upon further analyses of the self-efficacy scale a second version of instrument responses was developed by van der Bijl and Shortridge-Baggett (2001) as an asymmetric 5-point Likert rating scale (Appendix L), which included:

- “Certainly”
- “Most probably”
- “Probably yes”
- “Maybe, maybe not”
- “Unlikely”

Differences between the two instrument versions is specified with the symmetric scale being subject to ceiling effects. In this manner subjects can perceive themselves as
having higher levels of self-efficacy when performing routine self-management activities (van der Bijl & Shortridge-Baggett, 2001). As a result, it can be difficult to identify changes in self-efficacy levels among subjects when analyzing data. The asymmetric scale is used to address the identified “ceiling effect.”

Reliability of the “Diabetes Management Self-Efficacy Scale for Type 2 Diabetes” has a Pearson’s correlation-coefficient for test-retest reliability of 0.79 which was calculated and determined to be statistically significant ($p < 0.01$). Researchers have determined that the validity of the instrument measured strength with regard to self-care activities that patients diagnosed with type 2 diabetes need to perform in order to prevent short and long term complications (van der Bijl & Shortridge-Baggett, 2001).

Items were incorporated into the instrument to address the construct concerning type of diabetes programming received in this manner, were self-developed which focused on two components. As such, the first component incorporated self-reported information from subjects that asked how often they visited a medical provider for their diabetes labeled number 12, in Appendices I (final instrument for clinic subject pool) and J (final instrument for FBO subject pool). Response options to this item on the instrument were:

- “More than once a month”
- “Monthly”
- “3-4 times per year”
- “1-2 times per year”
- “Not visited doctor(s) in the last 12 months”
Instrument items also were included labeled number 15 (Appendices I & J) in the instrument that asked subjects if they participated in community or support group programs. Responses to this item were dichotomous:

- “Yes”
- “No”

Subsequent items noted as number 38 (Appendix I clinic) and number 39 in Appendix J (FBO) asked subjects about the frequency in which they attended such programming and response options for this item were:

- “Never”
- “Less than once a month”
- “Once a month”
- “More than once a month”

Additionally, subjects were asked to indicate if they received diabetes patient education from their health care provider within the past year (number 14, Appendices I & J). The response set for this particular item ranged from:

- “Never”
- “Almost never”
- “Sometimes”
- “Usually”
- “Almost always”
- “Always”
The second component of the diabetes education construct involved subjects being asked to reflect on diabetes self-management education (DSME) information received from their clinician labeled number 13 or a faith-based program if they participated noted as number 39 (clinic) and number 40 (FBO) in the final instrument (Appendices I & J). Respondents were asked to select all response options that were applicable:

- “Exercise”
- “Diet”
- “Foot exam”
- “Taking medications”
- “Group or one-on-one education”
- “Blood pressure”
- “Hemoglobin A1C”
- “Cholesterol”
- “Blood glucose check”

The demographic subscale items in the final instrument (1 through 7, Appendices I & J) were based on the Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System Questionnaire ([BRFSS], 2013). Core items included age, marital status, type of health insurance coverage, and education of study subjects. Items specific to one’s diabetes (8 through 11, Appendices I & J) in the final instrument also were reformatted from the CDC BRFSS (2013). Such items asked subjects:
• How long individuals had been diagnosed with this chronic condition.
• How long had they been receiving treatment for their diabetes.

Response options to these instrument items were:
• “Less than a year”
• “Greater than a year”

Subsequent diabetes items asked subjects to self-report information about taking insulin or other diabetes medication as prescribed. Response options to this instrument item included:
• “No, I have never had them”
• “No, but I took them before”
• “Yes, some of the time”
• “Yes, daily”

Based on the pilot study, two different forms of instrument items (Appendix I & J) were designed to be administered at each site. Data collection for this study took place in two geographic locations that featured both faith-based programming and clinic settings. Administration of different versions in this manner would maximize the clarity of respondents’ experience with different educational programs. In the pilot, respondents were asked, “Have you ever participated in a church or faith-based education program for your diabetes in the past 12 months?” As such, this particular item did not work in the pilot study. As previously mentioned, lack of program recognition as a FBO by subjects or respondents not having an awareness of who sponsored the FBO were reasons
attributed to why this particular item did not work in the pilot. The revised item provided an opportunity for subjects to indicate they recognized the program was a faith-based organization. Specifically, modification of the item that was ineffective and newly developed items reflected subject participation in activities “at this” organization (recruitment site) instead of participation in a FBO. In this manner, item modifications enhanced clarity for subjects. Subjects should have a clearer understanding about responses regarding education or activities participated in, at the recruitment site sponsored by the FBO. The modified items added to the final instrument included:

- “Today, are you here to participate in the program for your diabetes?”
- “Do you know this diabetes program is also known as a faith-based or church-based education program?”

Another item was self-developed by the researcher to learn if subjects could have participated at other FBOs with similar programming. This particular item about similar programming was constructed as: “Are you participating in other similar programs somewhere else (e.g., community center, church, work, school)?” All modified items were incorporated to maximize clarity for respondents in the final instrument versions (Appendix I & J). There were a total number of 42 items on the clinic instrument (Appendix I) and 43 items on the FBO instrument (Appendix J). There was an additional item number 37 on the FBO instrument that asked subjects to reflect if they were aware that the program they were attending was a FBO or church-based education program.
Study Data Collection

The modified instruments with the asymmetric version of the self-efficacy items were submitted and approved. IRB approval to conduct the final study was requested from and received April 2014, from the Kent State University Office of Research Compliance prior to data collection (Appendix A). Additionally, letters of support to conduct the study at the clinical sites were sought and received from the health facility system Vice President of Medical Education; Chief Academic Officer along with the System Vice President of Diversity and Community Benefit (Appendix B). Further support to conduct the study at each ambulatory clinic was requested via e-mail, phone call, or face-to-face from and approved by practice managers from both clinics. Such requests were done in this fashion as introduction of the researcher to the clinical practice managers and personnel at the recruitment sites.

The number and ethnicity of the subjects were determined during and after data collection and analysis. The study was conducted at the ambulatory sites during regular operating hours. During initial visits, the researcher approached the clinic subjects in the waiting room randomly while subjects were waiting to be seen by their physician.

At the FBO site the study was conducted during scheduled programming during the week or weekends. At both data collection sites instruments administered were color coded to support easy identification for data analysis. Subject recruitment at both the clinic and FBO sites occurred in the same manner:
• The researcher approached subjects and explained from a script (Appendix G) the purpose of the study and that it was being conducted by a Kent State University graduate student.

• Adults having a diagnosis of type 2 diabetes were asked to voluntarily respond to the self-administered pencil/paper instrument (Appendices I clinic, J FBO).

• Study subjects were asked to read and sign a consent form (Appendix H) prior to responding to the instrument. (The consent form explained the study purpose and that the individual could discontinue his or her participation at any time without loss of benefits from the organization.)

• A copy of the consent form was given to each subject for future reference prior to completing the instrument.

• Individuals were asked to voluntarily complete the paper and pencil instrument.

• Individuals were instructed by the researcher that the instrument could take 20 minutes or less to complete, that their responses would remain confidential, and there was no identifying information to associate them to their instrument responses.

**Data Analysis**

The dependent variables self-efficacy and diabetes self-management education in this study were generated from their associated individual instrument items measured in this study. Self-efficacy pertained to the 20-items included in the final instrument asking subjects if they were able to perform certain diabetes self-management activities.
Items completed by respondents were totaled to obtain a composite self-efficacy score for each subject among the two study groups. This analysis process enabled the researcher to compare self-efficacy scores among the two study groups. Chronbach’s alpha was also performed to measure reliability of the self-efficacy 20-item, 4-point Likert scale with 135 cases. Reliability of the self-efficacy instrument demonstrated a Chronbach’s alpha value equal to 0.93 ($p < 1$).

Diabetes self-management education (DSME) reflected instrument items pertaining to education programming type, scope of DSME education received and how often subjects participated in faith-based organization programs and visited their clinician. Subjects were asked to select any of the 9 DSME items that were applicable to them with respect to their participation in the FBO and with their medical care provider (Appendices I & J). The 9-item DSME responses were weighted such that having received education about diet, physical activity, and blood glucose level monitoring was scored 3 points while receiving education on each of the remaining items was awarded only 1 point. As such, development of the scoring method was guided by previous research (Benjamin, Edwards, & Bharti, 2005). This scoring system is arbitrary but reflects what the literature suggested as priority diabetes self-management activities (AADE, 2013; Hunt et al., 2012, Yeary et al., 2011). An individual’s score on the nine items was then multiplied by his or her frequency of occurrence to obtain a final DSME score. With respect to the FBO sample, the final DSME score was his or her DSME score obtained from the clinic visit plus the DSME score from the FBO. Therefore, the FBO sample did have a higher score measured as their DSME. Such an analysis enabled
the researcher to compare diabetes self-management education among the two study groups.

Demographic instrument items including age, gender, race/ethnicity, health insurance, income, education level, and participation in a FBO program were measured to predict self-efficacy and diabetes self-management education among the two subject pools. Based on findings from the pilot, the researcher would include all subjects included in both groups from the subject pools in the final data analysis. Inclusion of all subjects enabled the researcher to obtain her proposed study sample size to enhance statistical power of the study analyses. Additionally, results from the final study analysis would indicate that there was no statistical significance with respect to race/ethnicity among the two study groups that were compared. Particularly, such findings would be demonstrated in the final regression model analyses.

**Hypotheses Testing**

Analyses pertaining to study hypotheses (Table 4) were conducted to demonstrate a comparison focused on the type of education programming received and the effect of diabetes self-management education received on perceived self-efficacy level among adults particularly African American patients diagnosed with type 2 diabetes compared to those who did and did not participate in faith-based programs using SPSS version 22 statistical software:
### Table 4

*Study Variables and Statistical Methods for Data Analysis*

<table>
<thead>
<tr>
<th>Study Hypotheses</th>
<th>Variables</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Null Hypothesis 1</strong>: There is no statistically significant difference in the level of self-efficacy between adults particularly African American patients with type 2 diabetes who participated in a faith-based education program as compared to those who did not</td>
<td>Self-efficacy (DV) FBO/Clinic(IV)</td>
<td>Independent Sample T-test</td>
</tr>
<tr>
<td><strong>Null Hypothesis 1a</strong>: Attending a faith-based education program is not a statistically significant predictor of the level of self-efficacy, after adjusting for selected demographic variables,</td>
<td>Self-efficacy (DV) FBO/clinic, education, age, sex, race, health insurance, income, other diagnosed chronic illnesses (IVs’)</td>
<td>Multiple Regression</td>
</tr>
<tr>
<td><strong>Null Hypothesis 2</strong>: There is no statistically significant difference in diabetes self-management education (DSME), including diet, physical activity, and glucose monitoring, among adults particularly African American patients diagnosed with type 2 diabetes who attended faith-based education programs as compared to those who did not</td>
<td>DSME (DV) FBO/Clinic(IV)</td>
<td>Independent Sample T-test</td>
</tr>
<tr>
<td><strong>Null Hypothesis 2a</strong>: Attending a faith-based education program is not a statistically significant predictor of diabetes self-management education (DSME), after adjusting for selected demographics</td>
<td>DSME (DV) FBO/Clinic, education, age, sex, race, health insurance, income, other diagnosed chronic illnesses (IVs’)</td>
<td>Multiple Regression</td>
</tr>
<tr>
<td><strong>Null Hypothesis 3</strong>: There is no statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among adults particularly African American adults diagnosed with type 2 diabetes.</td>
<td>Self-efficacy and Diabetes self-management education</td>
<td>Pearson’s Correlation</td>
</tr>
<tr>
<td><strong>Null Hypothesis 3a</strong> (clinic sample): There is no statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among those who did not participate in faith-based education programs.</td>
<td>Self-efficacy and DSME (clinic subjects only)</td>
<td>Pearson’s Correlation</td>
</tr>
</tbody>
</table>
Table 4 (continued)

**Study Variables and Statistical Methods for Data Analysis**

<table>
<thead>
<tr>
<th>Study Hypotheses</th>
<th>Variables</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Null Hypothesis 3b</strong> (FBO sample): There is no statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among those who did participate in faith-based education programs.</td>
<td>Self-efficacy and DSME (FBO subjects only)</td>
<td>Pearson’s Correlation</td>
</tr>
</tbody>
</table>

**Hypothesis 1**

Null Hypothesis: There is no statistically significant difference in the level of self-efficacy between adults particularly African American patients with type 2 diabetes who participated in a faith-based education program as compared to those who did not.

Alternative Hypothesis: There is a statistically significant difference in the level of self-efficacy between adults particularly African American patients with type 2 diabetes who participated in a faith-based education program as compared to those who did not.

**Hypothesis 1a**

Null Hypothesis: Attending a faith-based education program is not a statistically significant predictor of the level of self-efficacy, after adjusting for selected demographic variables.
Alternative Hypothesis: Attending a faith-based education program is a statistically significant predictor of the level of self-efficacy, after adjusting for selected demographic variables.

**Hypothesis 2**

Null Hypothesis: There is no statistically significant difference in diabetes self-management education (DSME), including diet, physical activity, and glucose monitoring, among adults particularly African American patients diagnosed with type 2 diabetes who attended faith-based education programs as compared to those who did not.

Alternative Hypothesis: There is a statistically significant difference in diabetes self-management education (DSME), including diet, physical activity, and glucose monitoring, among adults particularly African American patients diagnosed with type 2 diabetes who attended faith-based education programs as compared to those who did not.

**Hypothesis 2a**

Null Hypothesis: Attending a faith-based education program is not a statistically significant predictor of diabetes self-management education (DSME), after adjusting for selected demographics.

Alternative Hypothesis: Attending a faith-based education program is a statistically significant predictor of diabetes self-management education (DSME), after adjusting for selected demographics.
**Hypothesis 3**

Null Hypothesis: There is no statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among adults particularly African American patients diagnosed with type 2 diabetes.

Alternative Hypothesis: There is a statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among adults particularly African American patients diagnosed with type 2 diabetes.

**Hypothesis 3a**

Null Hypothesis for clinic sample: There is no statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among those who did not participate in faith-based education programs.

Alternative Hypothesis for clinic sample: There is a statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among those who did not participate in a faith-based education programs.

**Hypothesis 3b**

Null Hypothesis for FBO sample: There is no statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among those who did participate in faith-based education programs.

Alternative Hypothesis for FBO sample: There is a statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among those who did participate in faith-based education programs.
The Independent sample t-test was used to detect the differences in self-efficacy and diabetes self-management education among subjects who participated in faith-based programs as compared to those in the clinic environments with respect to Hypotheses 1 and 2 (Table 4). The independent sample t-test analysis with two-tailed probability was used to test Hypotheses 1 and 2. When the means of two independent groups are being compared the independent sample t-test is an appropriate test to analyze such study data (Howell, 2007). Since each group was comprised of an independent set of subjects, these groups were considered to be independent. Output from the software of the independent sample t-test analysis can provide useful information with respect to descriptive, significant, or non-significant study statistics (Howell, 2007). The descriptive or group statistics can help the researcher to confirm that the correct number of study subjects is included in the analyses. Consequently, any differences between group means and variances should be apparent. The output also reported standard deviations. Levene’s test for equality of variances is another independent sample t-test analysis output (Howell, 2007). Specifically, this test determines whether or not variances of the groups are significant.

Multiple regression analyses were used to detect the predictive value of participation in a faith-based program on self-efficacy and diabetes self-management education among adult patients diagnosed with type 2 diabetes when adjusting for demographic information in the analysis in respect to Hypotheses 1a and 2a (Table 4). Sample demographics included gender, race/ethnicity, age, education level, income, health insurance, and diagnosis of other chronic illnesses other than type 2 diabetes. A
backward stepwise regression analyses was used to perform this measurement. In this manner all independent variables were entered into the test. Subsequently, the least significant variable at each step of the regression was excluded (Nau, 2014). The intended outcome is that the statistically significant predictive variable/s (e.g., participation in faith-based program, income) would remain in the regression model during the last step. By conducting this method of testing, variables were excluded automatically one-by-one using the SPSS software.

Pearson’s correlation analysis was used to test Hypotheses 3, 3a, and 3b (Table 4). Correlation coefficients ($r$) were used to measure the strength and direction of relationships between these variables (Howell, 2007).
CHAPTER IV

RESULTS

The purpose of this study was to analyze the influence of education programming type, scope of diabetes self-management education received, and selected demographics on self-efficacy among adult African Americans with type 2 diabetes.

Study Research Questions

Analyses for this comparative study were guided by the following three research questions. Based upon the examination of findings from each research question, subsequent questions were constructed that focused analyses on education programming type, diabetes self-management education, and self-efficacy among the two study groups.

1. Is there a difference in the level of self-efficacy between adults, particularly African Americans with type 2 diabetes, who participated in a faith-based diabetes education program as compared to those who did not?
   1a. If yes, is attending a faith-based program a predictor of self-efficacy, after adjusting for selected demographic variables?

2. Is there a difference in diabetes self-management education, including diet, physical activity, and glucose monitoring, among adults, particularly African American patients diagnosed with type 2 diabetes, who attended faith-based diabetes education programs as compared to those who did not?
   2a. If yes, is attending faith-based diabetes education programs a predictor of diabetes self-management education, after adjusting for selected demographics?
3. Is there a relationship between self-efficacy and diabetes self-management education among adults, particularly African American patients diagnosed with type 2 diabetes?

3a. If yes, is this relationship the same for those who attended faith-based diabetes education programs as compared to those who did not?

**Data Collection**

For this study, data were gathered from subjects in two different diabetes care settings. One involved subjects receiving care at ambulatory clinic centers. The other included subjects who received medical care from clinicians and added support from extended care and support providers at local faith-based organizations (FBO). All data were collected in one specific region of a Midwestern state.

Recruitment of subjects being treated at the ambulatory clinic centers occurred at two primary care sites located in a level 1 trauma health facility. Data were collected between May and August of 2014. Subjects who visited the clinic had scheduled appointments with a diabetes educator and/or a medical care provider for management of their diabetes. In specific, patients diagnosed with type 2 diabetes were scheduled for appointments Monday through Friday during business hours. Prior to data collection visits by the researcher, the practice manager shared information regarding which days the majority of patients were scheduled for appointments. In such cases, the practice manager provided a detailed schedule of appointment times with the researcher. This advance notice helped to increase recruitment of subjects for the study. In addition, this schedule helped with time management challenges associated with data collection in this
clinical setting. Importantly, following each visit, the schedule provided by the practice manager was destroyed by the researcher.

During each clinical visit, the researcher met subjects in the clinic waiting room area to recruit their participation in the study. The following procedures were followed with consistency:

- Upon arrival at both clinic sites, patients registered for their appointments with the clinic staff.
- In an effort not to disrupt patient flow, the researcher waited to approach patients after they had registered.
- Once patients registered and were seated in the waiting area, the researcher approached individuals and identified herself by name and as a graduate student from Kent State University.
- According to the script (Appendix G), the researcher explained the purpose of the study to and asked potential subjects if they would be willing to participate in the study.

Finally, patients with vision impairment who expressed a willingness to participate in this study were asked if they were comfortable having the consent form and items on the instrument read to them. If so, their responses would be recorded by a caregiver or the researcher. Fortunately, all subjects who had visual impairments in this specific subject pool were able to sign the consent form for themselves.

The process of data collection at clinical sites was implemented in the following manner with consistency:
• Subjects were asked to read and sign the consent form (Appendix H).

• A copy of the consent form was given to each subject for future reference prior to their responding to items on the instrument.

• Study subjects were then given the yellow color-coded paper (Appendix I, e.g., yellow designated for clinic) and pencil instrument on a clipboard. They were asked to complete all items while they were waiting to be called for their appointment by clinic staff.

• Once patients completed the instrument, they were returned to the researcher.

During clinic visits, if patients did not complete the instrument prior to being called in for their appointment, they were asked to complete and return the instrument to the researcher once their period of engagement with the clinician was concluded. To expedite this process, the researcher remained in the waiting room during the period of time when subject appointments were conducted. On rare occasions when patients left instruments in their appointment rooms, clinic staff collected and returned them to the researcher. In other instances, staff placed the instrument in an envelope labeled confidential for the researcher to retrieve at a later time. Once instruments were completed and received by the researcher they were kept in a locked file.

Among subjects whose diabetes care and management was enriched by their participation in supplemental activities provided by faith-based organizations (FBO), data collection occurred on weekdays and weekends, June through September of 2014. Visits to FBO recruitment sites took place during scheduled community diabetes health screenings, health fairs, pantry activities, and bible study sessions as listed in Table 5.
Table 5

Data Collection Sites of Faith-Based Organizations

<table>
<thead>
<tr>
<th>FBO</th>
<th>Location type</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Church</td>
<td>Cuyahoga (west side)</td>
</tr>
<tr>
<td>B</td>
<td>Church</td>
<td>Cuyahoga (east side)</td>
</tr>
<tr>
<td>C</td>
<td>Church</td>
<td>Lorain</td>
</tr>
<tr>
<td>D</td>
<td>Church</td>
<td>Summit</td>
</tr>
<tr>
<td>E</td>
<td>Church</td>
<td>Summit</td>
</tr>
<tr>
<td>G</td>
<td>Health center (FBO sponsored)</td>
<td>Summit</td>
</tr>
</tbody>
</table>

In this context, these activities and sessions were offered free of charge and open to church members and residents in the surrounding community. In addition, the majority of the faith-based organizations had a nurse available with whom study subjects could speak about their diabetes.

During program activity, visits by the researcher at listed FBO sites (Table 5), church pastors, program coordinators, or staff made announcements to potential subjects that a study concerning diabetes was being conducted. Also, the researcher was permitted to announce her presence and study purpose by the pastors and or program staff.

The following process occurred at the FBO sites (Table 5) in a specific region of a Midwestern state, with consistency:
The researcher asked permission from a program staff member via e-mail or phone to attend program activities prior to each FBO visit.

When subjects arrived at the FBO sites, they registered for program activities with a program staff member/s at a table.

Following registration participants would be seated and wait until they were called by a staff member to participate in program activities.

In an effort not to disrupt the registration process, the researcher waited to approach subjects after they had registered.

Once patients registered and were seated, the researcher approached subjects and identified herself by name and as a graduate student from Kent State University.

According to the script (Appendix G), the researcher explained the purpose of the study and asked potential subjects if they would be willing to participate in the study.

A table was set up at each site during program activities that enabled the researcher to engage with subjects, explain the study purpose according to the script (Appendix G), and recruit participation. In addition, American Diabetes Association informational brochures and other resources were available for all program subjects to review. At FBO site “C,” tabletop poster boards reflecting diabetes symptoms, risks, and community screening and healthy lifestyle resources also were available for review by attendees. The church and local community agent provided these additional enrichment resources.
Like their counterparts recruited at the clinical sites, patients with vision impairment who expressed a willingness to participate in this study were asked if they were comfortable having the consent form and items read to them while their responses were recorded by a caregiver or the researcher. Fortunately, all subjects who had visual impairments were able to sign the consent form for themselves.

Administration of data collection at FBO sites was conducted in the following manner with consistency:

- Subjects were asked to read and sign the consent form (Appendix H).
- A copy of the consent form was given to each subject for future reference prior to their responding to items on the instrument.
- Study subjects were then given the purple color-coded paper (Appendix J, e.g., purple designated for FBO) and pencil instrument to complete at the table or for feasibility where they were seated.
- They were asked to complete all items before or after participating in activities.
- Once instruments were completed subjects returned them to the researcher who subsequently placed them in a locked file.

On occasion, subjects were called to participate in program activities by staff while they were responding to items on the instrument. In such instances, they would leave their instrument at the table then return to finish providing responses with other tasks were completed. Also, the researcher circulated among program participants during program activities to respond to questions and provide clarification about the study.
purpose. Circulation among participants provided an opportunity for her to ask potential subjects to complete the instrument when there were no participants to talk with at the table.

**Demographic Comparison of the Two Subject Groups: Descriptive Statistics**

A total of 163 instruments were administered among the study subjects at both the clinic and FBO recruitment sites. Of that total, 157 subjects returned instruments on which responses were provided. Due to limitations in the total sample size, responses provided to all items in the subscales were included in the final data analysis. As such, a total of 81 subjects returned instruments collected from the two clinical sites. Comparatively, a total of 76 subjects returned instruments at the FBO recruitment sites. In this context descriptive statistics revealed demographic findings from the two study groups (Table 6).

Subjects who participated in the study included 62.8% (49) women from the clinic whereas the other 37.2% (29) were men. At the FBO sites the subject pool consisted of 66.2% (51) women and 33.8% (26) men.

With respect to race/ethnicity 56.4% (44) study subjects from the clinical sites and 64.1% (50) from the FBO sites described themselves as African American (Table 6). Among the two clinical sites 39.7% (31) subjects and 29.5% (23) recruited from the FBO sites reported themselves to be White/Caucasians. Only 1.3% (1) of subjects from the clinic locations and 5.1% (4) from the FBO sites indicated being Latino.
Table 6

Comparison of Study Groups Demographics by Gender, Race, Age, Education Level, Marital Status, Health Insurance, Income and Diabetes Mellitus Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Clinic percent (n)</th>
<th>FBO percent (n)</th>
<th>Chi-square ($\chi^2$)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>62.8% (49)</td>
<td>66.2% (51)</td>
<td>0.20</td>
<td>0.66</td>
</tr>
<tr>
<td>Male</td>
<td>37.2% (29)</td>
<td>33.8% (26)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity/Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American/Black</td>
<td>56.4% (44)</td>
<td>64.1% (50)</td>
<td>3.70</td>
<td>0.30</td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>39.7% (31)</td>
<td>29.5% (23)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latino</td>
<td>1.3% (1)</td>
<td>5.1% (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native American</td>
<td>2.6% (2)</td>
<td>1.3% (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-44 years</td>
<td>27.0% (20)</td>
<td>16.9% (11)</td>
<td>7.34</td>
<td>0.02*</td>
</tr>
<tr>
<td>45-64 years</td>
<td>58.1% (43)</td>
<td>49.2% (32)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65 years or older</td>
<td>14.9% (11)</td>
<td>33.8% (22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some high school</td>
<td>25.6% (20)</td>
<td>23.7% (18)</td>
<td>0.59</td>
<td>0.90</td>
</tr>
<tr>
<td>High school graduate/GED</td>
<td>33.3% (26)</td>
<td>32.9% (25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>28.2% (22)</td>
<td>26.3% (20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College graduate</td>
<td>12.8% (10)</td>
<td>17.1% (13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>47.0% (37)</td>
<td>32.9% (23)</td>
<td>5.36</td>
<td>0.07</td>
</tr>
<tr>
<td>Married</td>
<td>25.6% (20)</td>
<td>39.5% (30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>19.2% (15)</td>
<td>22.4% (17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health insurance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>12.8% (10)</td>
<td>25.3% (19)</td>
<td>7.33</td>
<td>0.06</td>
</tr>
<tr>
<td>Public</td>
<td>53.8% (42)</td>
<td>53.3% (40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>12.8% (10)</td>
<td>12.8% (10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>20.5% (16)</td>
<td>8.0% (6)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*(table continues)*
Table 6 (continued)

*Comparison of Study Groups Demographics by Gender, Race, Age, Education Level, Marital Status, Health Insurance, Income and Diabetes Mellitus Data*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Clinic percent (n)</th>
<th>FBO percent (n)</th>
<th>Chi-square ($X^2$)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>88.2% (67)</td>
<td>75.3% (55)</td>
<td>4.93</td>
<td>0.18</td>
</tr>
<tr>
<td>$20,000 to $40,000</td>
<td>7.9% (6)</td>
<td>15.1% (11)</td>
<td>0.01</td>
<td>0.94</td>
</tr>
<tr>
<td>$40,000 to $60,000</td>
<td>3.9% (3)</td>
<td>6.8% (5)</td>
<td>0.16</td>
<td>0.66</td>
</tr>
<tr>
<td>Greater than $60,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of type 2 diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>14.5% (11)</td>
<td>7.9% (6)</td>
<td>1.66</td>
<td>0.20</td>
</tr>
<tr>
<td>Greater than 1 year</td>
<td>85.5% (65)</td>
<td>92.1% (70)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Chronic illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>49.3% (36)</td>
<td>48.7% (37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>50.7% (37)</td>
<td>51.3% (39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receiving diabetes treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>13.7% (10)</td>
<td>9.7% (7)</td>
<td>0.55</td>
<td>0.46</td>
</tr>
<tr>
<td>Greater than 1 year</td>
<td>86.3% (63)</td>
<td>90.3% (65)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current medication compliance as prescribed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No I never had them</td>
<td>10.3% (8)</td>
<td>10.5% (8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No but took them before</td>
<td>3.8% (3)</td>
<td>6.6% (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, some of the time</td>
<td>6.4% (5)</td>
<td>5.3% (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, daily</td>
<td>79.5% (62)</td>
<td>77.6% (59)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinician visits in last 12 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than once/month</td>
<td>9.2% (7)</td>
<td>4.0% (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly</td>
<td>10.5% (8)</td>
<td>24.0% (18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 to 4 times/month</td>
<td>53.9% (41)</td>
<td>52.0% (39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 2 times/year</td>
<td>19.7% (15)</td>
<td>14.7% (11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not visited medical provider in last 12 months</td>
<td>6.6% (5)</td>
<td>5.3% (4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: * Indicates the chi square value statistically significant at $p \leq 0.05$ level
Among subjects 2.6% (2) and 1.3% (1) described themselves as Native American from the clinical sites and FBO sites.

Subjects between 25 to 44 years of age were represented by 27% (20) of respondents from the clinical sites whereas 16.9% (11) were from the FBO locations. Age ranging between 45 to 64 years was reported by 58.1% (43) of the subject pool from clinical sites and 49.2% (32) from the FBOs. Among the two study groups 65 years of age and older consisted of 14.9% (11) subjects from clinics and 33.8% (22) were accounted from the FBO locations (Table 6).

Demographic information denoted in the study included level of education among the two groups (Table 6). Study subjects who completed some high school were represented by 25.6% (20) of the clinic subject pool and 23.7% (18) of the FBO subjects. A high school diploma or GED was achieved by 33.3% (26) of subjects from the clinic and 32.9% (25) of the FBO subjects. Other subjects who participated in the study completed some post-secondary level education. As such this was indicated by 28.2% (22) subjects from the clinical sites and 26.3% (20) from the FBO sites. At least some college education was specified by 12.8% (10) of the clinic subjects and 17.1% (13) of subjects from the FBO locations.

The majority of subjects from the two study groups reported being single (Table 6). Subjects who reported single as their marital status represented 47% (37) of the subject pool who were recruited from the clinical sites whereas 32.9% (23) were from the FBO locations. Married subjects consisted of 25.6% (20) from the clinics and 39.5% (30) were accounted for at the FBO sites. Subjects who participated in the study with a
divorce marital status were represented by 19.2% (15) from the clinical locations and 22.4% (17) from the FBO sites.

Public health insurance accounted for the type of coverage carried by the majority of subjects who participated in the study (Table 6). Subjects from the clinical sites included 53.8% (42) who designated having public health insurance whereas 53.3% (40) were from the FBO locations. Private health insurance coverage was indicated by 12.8% (10) of study subjects from the clinical sites and 25.3% (19) from the FBO sites. Additionally, 12.8% (10) subjects from both the FBO and clinical sites reported having other types of insurance. No insurance coverage was specified by 20.5% (16) of the subject pool from the clinical sites and 8.0% (6) from the FBO sites.

Among the two study groups annual income less than $20,000 was indicated by 88.2% (67) of subjects from the clinical sites and 75.3% (55) from the FBO sites (Table 6). Subjects who specified income between $20,000 and $40,000 represented 7.9% (6) from the clinical locations and 15.1% (11) from the FBO sites. There were 3.9% (3) study subjects from the clinical sites and 6.8% (5) from the FBO sites who designated their income range from $40,000 to $60,000. Only 2.7% (2) of the subject pool reported having income greater than $60,000 from the FBO sites.

Data related to length of diagnosis and management of diabetes mellitus also were gathered in this study (Table 6). Study subjects who reported being diagnosed with type 2 diabetes greater than 1 year consisted of 85.5% (65) from the clinical sites and 92.1% (70) subjects from the FBO sites. A diagnosis of type 2 diabetes less than a year was represented by 14.5% (11) of clinic subjects whereas 7.9% (6) represented FBO subjects.
In addition to being diagnosed with type 2 diabetes greater than 1 year, 49.3% (36) of the subject pool from the clinical locations and 48.7% (37) from the FBO sites indicated having other chronic illnesses. In comparison, 50.7% (37) of subjects from the clinical sites and 51.3% (39) from FBO locations reported having no other chronic illnesses.

With regard to diabetes management, 86.3% (63) study subjects from the clinical sites and 90.3% (65) from the FBO locations indicated receiving treatment (medication) greater than 1 year. At the clinical sites, 13% (10) and 9.7% (7) at the FBO locations of subjects specified taking medication less than a year. Additionally, 79.5% (62) subjects from the clinical locations and 77.6% (59) from the FBO locations designated taking insulin and/or diabetes medication daily as prescribed. Taking medication as prescribed some of the time was noted by 6.4% (5) of the clinic subject pool and 5.3% (4) of FBO study subjects. Also, 3.8% (3) clinic respondents and 6.6% (5) FBO respondents designated they were not currently taking prescribed medication but had taken them previously. Some subjects indicated they never took prescribed diabetes medication. As such, this occurred among 10.3% (8) of the clinic subject pool and 10.5% (8) of FBO study subjects.

Additionally, from the clinical sites 53.9% (41) respondents and 52.0% (39) of FBO respondents noted they visited their physician at least 3 to 4 times a month to help manage their diabetes. Physician visits more than once a month occurred among 9.2% (7) of clinic subjects and 4.0% (3) of FBO subjects. Monthly physician visits were reported by 10.5% (8) of clinic respondents and 24.0% (18) of FBO respondents. Among study subjects during the last 12 months 6.6% (5) of the clinic subject pool and
5.3% (4) of the FBO subjects indicated they had not visited a medical provider for their diabetes management. Data collected in the study also were measured to determine any association between the two study groups using the chi-square analyses.

The chi-square ($X^2$) statistic was used to determine if the distribution of categorical variables were equally distributed among independent groups (Howell, 2007; Portney & Watkins, 2009). In this study, such an analysis was conducted to determine if there were any significant associations between categorical variables between the two study groups (Table 6). In this manner, application of this statistic was used to determine if there was an association between categorical variables sex, ethnicity/race, age, education, health insurance, income, length of diabetes diagnosis, and management among the clinic and FBO subject pools. Study outcomes of the chi-square test revealed that the categorical variable age was statistically significant ($p < 0.05$). Further, findings relative to the chi-square $p$-values indicated that there was no statistically significant proportion related to gender, race and ethnicity, education, marital status, income and health insurance between the study groups at the 0.05 level of significance with distribution between the two study groups. Further, there was no statistically significant distribution between groups regarding the variables length of diabetes diagnosis and medical treatment of this chronic condition. A statistically significant $p$ value = 0.02 was indicated among study subjects who reported their age (Table 6). As such, findings revealed the FBO group had more subjects (33.8%) who reported their age as 65 years or older when compared to the clinic group.
In summary, the study groups were comprised of adult subjects diagnosed with type 2 diabetes. African Americans represented the largest number of subjects in the two study groups. A majority (85.5% clinic, 92.1% FBO) indicated being diagnosed with diabetes mellitus for more than a year. Insulin or other diabetes medications were taken as prescribed daily by the majority (79.5% clinic, 77.6% FBO) of subjects. Finally, the majority (53.9% clinic, 52.0% FBO) of study subjects reported that they visited medical care providers at least 3 to 4 times a year (Table 6) to seek care and support for managing their diagnosed diabetes.

**Data Analysis of the Hypotheses**

Hypotheses based on the research questions provided the foundation for analyses to be conducted. In addition, predictive relationships between self-efficacy and self-management education between the two study groups were analyzed to reveal findings pertinent to the research questions and study purpose.

**Hypothesis 1**

Null Hypothesis: There is no statistically significant difference in the level of self-efficacy between adults particularly African Americans with type 2 diabetes who participated in a faith-based education program as compared to those who did not.

Alternative Hypothesis: There is a statistically significant difference in the level of self-efficacy between adults particularly African Americans with type 2 diabetes who participated in a faith-based education program as compared to those who did not.

The independent sample $t$-test analysis with two-tailed probability was used to test Hypothesis 1. It can be determined from this testing protocol if the probability
between two groups was the same with respect to the variable being measured (Howell, 2007; Portney & Watkins, 2009). Specifically, this analysis protocol was used to compare statistical means of self-efficacy levels between subjects who did and those who did not participate in the faith-based programs.

The $t$-test value designated from the equal variances not assumed test (Table 7) was used to test the extent to which no statistical significance was revealed. The means measured from the two groups were 64.73 (clinic subjects) and 67.59 (FBO subjects). The mean difference was -2.85 for this variable between groups of study subjects (Table 7). Findings from the analysis of Hypothesis 1 revealed no statistically significant difference in the level of self-efficacy among the 134 respondent subjects ($t = -1.42; p > 0.05$). As such, the Null Hypothesis is retained and the Alternative Hypothesis is rejected. This finding suggests that the self-efficacy of the two study groups was the same. Specifically, among the two subject pools, attending or not attending a FBO program did not influence levels of self-efficacy.

**Hypothesis 1a**

Null Hypothesis: Attending a faith-based education program is not a statistically significant predictor of the level of self-efficacy, after adjusting for selected demographic variables.

Alternative Hypothesis: Attending a faith-based education program is a statistically significant predictor of the level of self-efficacy, after adjusting for selected demographic variables.
Table 7

Summary of Descriptive Statistics and Independent Sample T-Test Between the Two Study Groups

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy</td>
<td>1 (Clinic)</td>
<td>66</td>
<td>64.73</td>
</tr>
<tr>
<td></td>
<td>2 (FBO)</td>
<td>69</td>
<td>67.59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean Difference</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances</td>
<td>-2.85</td>
<td>-1.42</td>
</tr>
<tr>
<td>Not assumed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Not statistically significant at the $p = 0.05$ level

A backward stepwise multiple regression analysis was used to test Hypotheses 1a to further examine if selected demographic variables when tested together were predictive of self-efficacy (Nau, 2014). The multiple regression analysis was used to examine the predictive value of participation in a faith-based program on self-efficacy among subjects after adjusting for the demographic variables of age, sex, income, health insurance, education level, race/ethnicity, marital status and having other chronic illnesses. This regression model revealed no statistically significant ($p > 0.05$) relationship (Table 8). The associated F-statistic was equal to 1.961. Findings from the regression analysis (Table 8) revealed that the model explained only 7.0% of the variance (Adjusted $R^2= 0.07$, $F (8, 95) =1.961, p>0.05$). In this context the Null Hypothesis is
retained and the Alternative Hypothesis is rejected. This analysis revealed that attending a faith-based program was not predictive of subjects’ self-efficacy levels.

Table 8

*Summary of Multiple Regression Model for Self-Efficacy of Subjects (N=103)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>t</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attending a FBO</td>
<td>-0.01</td>
<td>-0.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Adjusted $R^2 = 7.0\%$

Variables included in the regression model analysis: level of education, age, gender, race/ethnicity, health insurance, income, having other diagnosed chronic illnesses other than diabetes, and participation in FBO program

Interestingly, a further regression analysis revealed that two independent variables (age, health insurance) were predictive of a relationship with the dependent variable (self-efficacy). In this case, the independent variables of age and health insurance remained in the final model. This relationship was indicated by the statistically significant ($p < 0.01$) association with the F-statistic (6.743) in the final regression model (Table 9). Findings revealed that these remaining two predictors in the final model explained 10% of the variance (Adjusted $R^2 = 0.10$, $F (2,101) = 6.743$, $p < 0.05$). Specifically, data analysis disclosed that age ($B = 0.265$, $p < 0.05$) and having health insurance ($B = -0.16$, $p \geq 0.05$) remained in the final regression model and were suggestive of predicting self-efficacy (Table 9). This finding suggests that among
subjects’ their levels of self-efficacy were influenced by their age and by having health insurance.

Table 9

*Summary of Final Multiple Regression Model for Self-Efficacy of Subjects (N=103)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>t</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Summary Statistics</td>
<td>2</td>
<td>6.743</td>
<td>0.01**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.26</td>
<td>2.75</td>
<td>0.01**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Insurance</td>
<td>-0.16</td>
<td>-1.71</td>
<td>0.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Adjusted R$^2 = 10.0%*

Variables included in the regression model analysis: level of education, age, gender, race/ethnicity, health insurance, income, having other diagnosed chronic illnesses other than diabetes, and participation in FBO program.

*Indicates statistically significant at the $p = 0.05$ level

**Indicates statistically significant at the $p = 0.01$ level

Hypothesis 2

Null Hypothesis: There is no statistically significant difference in diabetes self-management education (DSME), including diet, physical activity, and glucose monitoring, among adults particularly African American patients diagnosed with type 2 diabetes who attended faith-based education programs as compared to those who did not.

Alternative Hypothesis: There is a statistically significant difference in diabetes self-management education (DSME), including diet, physical activity, and glucose monitoring, among adults particularly African American patients diagnosed with type 2 diabetes who attended faith-based education programs as compared to those who did not.
An independent sample $t$-test analysis with two-tailed probability was used to test Hypothesis 2. It can be determined from this analysis protocol if the probability between two groups were the same with respect to the variable being measured (Howell, 2007; Portney & Watkins, 2009). Specifically, this analysis protocol was used to compare statistical means of diabetes self-management education between subjects who did, and those who did not participate in faith-based programs. The $t$-test statistic designated from the equal variances not assumed test was used to interpret the extent to which statistical significance was revealed in this analysis ($t = -10.33; p \leq 0.05$) indicated in Table 10. Descriptive group statistics confirmed that 134 subjects were included in the analysis. Means measured from the two groups were 25.15 (clinic subjects) and 72.52 (FBO subjects) as shown in Table 10. Final data analysis relative to Hypothesis 2 demonstrated there was a statistically significant ($p = 0.01$) difference in diabetes self-management education among study subjects. With respect to Hypothesis 2, the Null Hypothesis is rejected and the Alternative Hypothesis is accepted. This finding suggests that it is unlikely that DSME between the two study groups was the same. As such, those subjects who participated in a FBO program did receive additional DSME.

**Hypothesis 2a**

Null Hypothesis: Attending a faith-based education programs is not a statistically significant predictor of diabetes self-management education, after adjusting for selected demographics.
Table 10

*Summary of Descriptive Statistics and Independent Sample T-Test Between the Two Study Groups*

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSME</td>
<td>1 (clinic)</td>
<td>66</td>
<td>25.15</td>
</tr>
<tr>
<td></td>
<td>2 (FBO)</td>
<td>69</td>
<td>75.52</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Mean Difference</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances not assumed</td>
<td>-47.37</td>
<td>-10.33</td>
<td>0.01**</td>
</tr>
</tbody>
</table>

*Note: * Indicates statistically significant at the $p = 0.05$ level  
**Indicates statistically significant at the $p = 0.01$ level

Alternative Hypothesis: Attending a faith-based education program is a statistically significant predictor of the diabetes self-management education, after adjusting for selected demographics.

A backward stepwise multiple regression analysis was used to test Hypothesis 2a (Nau, 2014). The multiple regression analysis was used to detect the predictive value of participation in a faith-based program on diabetes self-management education among adult patients diagnosed with type 2 diabetes when adjusting for demographics age, sex, income, health insurance, education level, race/ethnicity, marital status, and having other chronic illnesses. This analysis protocol revealed independent variables (age, income, and participation in a FBO program) were predictive of a relationship with the dependent
variable (DSME). This relationship was indicated by the statistically significant \( p < 0.01 \) association with the F-statistic (12.91) in the final regression model designated in Table 11. Upon further data analysis (Table 11) the three predictors explained 33% of the variance (Adjusted \( R^2 = 0.33 \), F (3,71) = 12.91, \( p < 0.05 \)). Outcomes from this analysis protocol suggested that age \( (B = 0.200, p < 0.05) \), income \( (B = 0.253, p < 0.05) \) and participation in a FBO diabetes education program \( (B = 0.415, p < 0.05) \) were predictive of diabetes self-management education when subjects participated in a FBO. In this case, the Null Hypothesis is rejected and the Alternative Hypothesis is accepted. In specific, this finding suggests that among study subjects’ diabetes self-management education was influenced by age, income, and participation in a FBO diabetes education program.

Table 11

*Summary of Multiple Regression Model for Diabetes Self-Management Education of Subjects (N=74)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>t</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Summary Statistics</td>
<td>3</td>
<td>12.91</td>
<td></td>
<td></td>
<td>0.01**</td>
</tr>
<tr>
<td>Variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.20</td>
<td>2.05</td>
<td></td>
<td></td>
<td>0.04*</td>
</tr>
<tr>
<td>Income</td>
<td>0.25</td>
<td>2.60</td>
<td></td>
<td></td>
<td>0.01**</td>
</tr>
<tr>
<td>Participation in FBO program</td>
<td>0.41</td>
<td>4.24</td>
<td></td>
<td></td>
<td>0.01**</td>
</tr>
</tbody>
</table>

*Note. Adjusted \( R^2 = 33\% \)*

Variables included in the regression model analysis: level of education, age, gender, race/ethnicity, health insurance, income, having other diagnosed chronic illnesses other than diabetes, and participation in FBO program.

*indicates statistical significance at the \( p = 0.05 \) level

** indicates statistical significance at the \( p = 0.01 \) level
Hypothesis 3

Null Hypothesis: There is no statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among adults particularly African American patients diagnosed with type 2 diabetes.

Alternative Hypothesis: There is a statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among adults particularly African American patients diagnosed with type 2 diabetes.

Pearson’s correlation analysis was used to test Hypothesis 3. In this analysis protocol the correlation coefficient (r) was used to measure the strength and direction of relationships between variables (Howell, 2007). The analysis in this context examined if there was a relationship between dependent variables DSME and self-efficacy.

The Pearson’s correlation statistic (r) was equal to 0.26. The associated p value was statistically significant at the 0.01 level as shown in Table 12. As such, the analysis protocol suggested there was a positive relationship between the dependent variables diabetes self-management education (DSME) and self-efficacy among 96 subjects from both subject pools. Specifically, from the corresponding instrument items subjects indicated having received diabetes education from a clinician and/or a FBO program. As a result, the Null Hypothesis is rejected and the Alternative Hypothesis is accepted. In context with this finding, among the clinic and FBO groups, there was a significant relationship between the DSME received from a clinician and FBO program and subject self-efficacy levels.
Table 12

**Relationship Between Self-Efficacy and Diabetes Self-Management Education of the Two Study Groups**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy and diabetes self-management education</td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>0.26</td>
</tr>
<tr>
<td>P</td>
<td>0.01**</td>
</tr>
<tr>
<td>N</td>
<td>96</td>
</tr>
</tbody>
</table>

** indicates statistical significance at the $p = 0.01$ level

**Hypothesis 3a**

Null Hypothesis for clinic sample: There is no statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among those who did not participate in a faith-based education program.

Alternative Hypothesis for clinic sample: There is a statistically significant relationship between self-efficacy and diabetes self-management education (DSME) among those who did not participate in a faith-based education program.

Pearson’s correlation analysis was used to test Hypothesis 3a. In this analysis protocol correlation coefficients ($r$) was used to measure the strength and direction of relationships between variables (Howell, 2007). In this context the analysis protocol examined if there was a relationship between the self-efficacy and DSME among the clinic subject pool who did not participate in a FBO program. The Pearson correlation value ($r$) was equal to 0.22. The associated $p$ value was equal to 0.08. Specifically, this
final data analysis revealed no statistically significant relationship ($p > 0.05$). Findings from this suggests there was no relationship between diabetes self-management education and self-efficacy among 63 subjects in the clinic group who did not participate in a FBO program (Table 13). As such, the Null Hypothesis is retained and the Alternative Hypothesis is rejected. Specifically, this finding confirmed that there was no statistically significant relationship between diabetes self-management education and self-efficacy among subjects who received DSME only from their clinician.

Table 13

*Summary of Correlations Among the Two Study Groups*

<table>
<thead>
<tr>
<th></th>
<th>Self-efficacy and DSME (Clinic)</th>
<th>Self-efficacy and DSME (FBO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>0.22</td>
<td>0.28</td>
</tr>
<tr>
<td>p</td>
<td>0.08</td>
<td>0.12</td>
</tr>
<tr>
<td>N</td>
<td>63</td>
<td>33</td>
</tr>
</tbody>
</table>

*Note: Not statistically significant at $p = 0.05$ level*

**Hypothesis 3b**

Null Hypothesis for FBO sample: There is no statistically significant relationship between self-efficacy and diabetes self-management education among those who did participate in a faith-based education program.
Alternative Hypothesis for FBO sample: There is a statistically significant relationship between self-efficacy and diabetes self-management education among those who did participate in a faith-based education program.

The analysis protocol examined if there was a relationship between self-efficacy and DSME among the FBO subject pool who indicated participation in a FBO program. In this manner, subjects did receive supplemental education. The FBO Pearson correlation value ($r$) was equal to 0.28. The associated $p$ (0.12) value was not statistically significant ($p > 0.05$) as shown in Table 13. This analysis protocol indicated there was no statistically significant relationship between diabetes self-management education and self-efficacy and among 33 subjects in the FBO study group who did participate in a FBO program. In this context, the Null Hypothesis is retained and the Alternative Hypothesis is rejected. Specifically, this finding suggests there was no statistically significant relationship between diabetes self-management education and self-efficacy among FBO subjects after participating only in such programming.

**Summary of Findings**

Testing protocol used in this study to analyze data relevant to each Hypothesis were the Independent Sample T-test, Multiple Regression, and Pearson’s Correlation. Particularly, these analyses protocol were used to summarize Hypotheses one through three with each of their subsequent hypotheses. In context with these analyses and inclusive of all hypotheses, this study examined the following basic research assumptions:
• Self-efficacy should be a strong predictor of or promote diabetes self-management behaviors.

• Diabetes self-management should improve through increased self-efficacy among adult African Americans diagnosed with type 2 diabetes when they participate in some type of diabetes health education and promotion program. Subsequently, there should be a difference in or increased diabetes self-management education among study subjects who participate in a FBO program.

• Adult African Americans with diabetes who participate in faith-based health education programs should have increased self-efficacy scores as compared to study subjects in the clinical environment. As such, there should be a potential positive and linear correlation between diabetes self-management education and self-efficacy among the two study groups.

In summary, study findings revealed such assumptions were not true. The exception to this was the statistically significant difference found with the dependent variable diabetes self-management education. Hypotheses that are statistically significant are designated with an asterisk.

**Hypothesis 1**

Null Hypothesis: There is no statistically significant difference in the level of self-efficacy between adults particularly African Americans with type 2 diabetes who participated in a faith-based education program as compared to those who did not.
Analysis of data relative to Hypothesis 1 revealed no statistical significance in the level of self-efficacy among subjects. Particularly, among African Americans with type 2 diabetes there was no difference in self-efficacy levels who participated in a faith-based program compared to those who did not. The Null Hypothesis is retained and the Alternative Hypothesis is rejected. This finding suggests attending or not attending FBO programs made no difference in levels of self-efficacy.

**Hypothesis 1a**

Null Hypothesis: Attending faith-based education program is not a statistically predictor of the level of self-efficacy, after adjusting for selected demographic variables.

In context with this analysis, attending a FBO made no difference in predicting self-efficacy among subjects. The Null Hypothesis is retained and the Alternative Hypothesis is rejected. Findings revealed the regression model that included attending a FBO program after adjusting for demographic variables was not statistically significant. This finding suggests that among subjects’ levels of self-efficacy was not influenced by attending a FBO program. Further, after adjusting for all demographic variables the final model revealed age and health insurance (potential predictor) were suggestive of predicting self-efficacy among those who attended a FBO program as compared to those who did not. This finding suggests that among subjects in this study levels of self-efficacy was influenced by their age and by having health insurance.

*Hypothesis 2*

Null Hypothesis: There was no statistically significant difference in diabetes self-management education, including diet, physical activity, and glucose
monitoring, among adults particularly African American patients diagnosed with type 2 diabetes who attended faith-based education programs as compared to those who did not.

There was a statistically significant difference in diabetes self-management education, including diet, physical activity, and glucose monitoring. Particularly, among African Americans with type 2 diabetes there was significant difference with those who participated in a faith-based program compared to those who did not. The Null Hypothesis is rejected and the Alternate Hypothesis is accepted. This finding suggests subjects who participated in a FBO program did receive additional DSME.

*Hypothesis 2a*

Null Hypothesis: Attending a faith-based education program was not a statistically significant predictor of diabetes self-management education, after adjusting for selected demographics.

There was statistically significant results indicated in the final regression model. Specifically, diabetes self-management education among subjects. As such, age, income, and participation in a FBO program were all statistically significant in predicting diabetes self-management education. The Null Hypothesis is rejected and the Alternate Hypothesis is accepted. Specifically, findings suggest that among study subjects diabetes self-management education (e.g., diet, exercise) received was influenced by age, income, and participation in a FBO diabetes education program.
*Hypothesis 3*

Null Hypothesis: There was no statistically significant relationship between self-efficacy and diabetes self-management education among adults particularly African American patients diagnosed with type 2 diabetes.

The final data analysis revealed that there was a positive relationship between diabetes self-management education and self-efficacy particularly, when both subject pools were analyzed together. The Null Hypothesis is rejected and the Alternative Hypothesis is accepted. In this context, findings suggest among the clinic and FBO groups that there was a relationship between DSME received from a clinician and a FBO program and their self-efficacy levels.

**Hypothesis 3a**

Null Hypothesis for clinic sample: There is no statistically significant relationship between self-efficacy and diabetes self-management education among those who did not participate in faith-based education programs.

There was no statistically significant relationship between self-efficacy and diabetes self-management education among the clinic group. As such, there was no relationship between diabetes self-management education and self-efficacy among clinic subjects who received education from a medical provider. The Null Hypothesis is retained and the Alternative Hypothesis is rejected. Findings in this analysis suggest that among clinic subjects diabetes self-management education received from clinicians did not mean a relationship between diabetes self-management education and their self-efficacy.
Hypothesis 3b

Null Hypothesis for FBO sample: There was no statistically significant relationship between self-efficacy and diabetes self-management education among those who did participate in faith-based education programs.

There was no statistically significant relationship between diabetes self-management education and self-efficacy and among the FBO study group. As such, study subjects received additional education after participation in a FBO program. The Null Hypothesis is retained and the Alternative Hypothesis is rejected. Specifically, findings in this analysis suggest that supplemental DSME received among subjects who participated in a FBO program did not mean there was a relationship between diabetes self-management education and their self-efficacy.
CHAPTER V
DISCUSSION

Purpose of the Study

The purpose of this study was to analyze the influence of education programming type, scope of diabetes self-management education received, and selected demographics on self-efficacy among adult African Americans with type 2 diabetes.

Theoretical Framework

Diabetes mellitus significantly affects the health status of adults living in the United States. Particularly, African Americans are affected by this devastating chronic condition. The theory of self-efficacy offers a research-based foundation to support the work of health educators developing community interventions designed to reduce the economic, human and public health burden created by chronic diseases including type 2 diabetes (Marks, Allegrante, & Lorig, 2005).

Self-efficacy focuses on an individual’s personal beliefs about his or her capacity to undertake behaviors that can lead to desired outcomes, in this case improved health status (Marks et al., 2005). As a result of his research, Bandura (1997, 2004) confirmed that one’s belief in their personal self-efficacy capacity is critical in motivating them to perform a specific task. In further analysis, evidence revealed when people believe they can produce desired behaviors from their actions they are more likely to keep trying to accomplish a task even if it is performed under difficult circumstances (Bandura, 2004).

Supplementing the clinical management of diabetes mellitus with community programming particularly with the support of FBOs helps to address the disparity of
diabetes among individuals most affected. Research has demonstrated this to be true, of African Americans in specific (Collins-McNeil et al., 2012; Davis-Smith, 2007; Faridi et al., 2010). Incorporation of self-efficacy enrichment in a faith-based learning approach shows promise toward improving unhealthy lifestyles (Davis et al., 2011).

In the context of this study, the American Diabetes Association (2013a) recommended that best practice for diabetes self-management education (DSME) should be focused on assisting people with this chronic condition to make informed self-management decisions. In their research, Funnell et al. (2008) described diabetes education as an effective strategy for improving clinical outcomes and quality of life. Self-management is described by Bandura (2004) as people learning to monitor their health behavior in situations under which they occur. Self-management education is an approach that can be tailored to address people’s individual health needs. In this manner it provides people with capability to manage their behavior change with personal guidance. Based upon findings in this study, it can be assumed that such vital educational instruction can be provided by health professionals and supplemental community faith-based programs that provide diabetes education.

**Sample Characteristics**

Subjects for this study were recruited from two primary care ambulatory clinics and six faith-based organizations within a particular urban region of a Midwestern state. Collectively, these two study groups were comprised of all adults who had been diagnosed with type 2 diabetes. Ages reported among the two study groups ranged from
The majority of subjects were between 45 and 65 years of age (clinic 58.1% and FBO 49.2%).

The annual income most reported by the clinic (88.2%) and FBO (75.3%) subject pools was less than $20,000. A majority of respondents from the clinical (53.8%) and FBO sites (53.3%) received public health insurance. In total, 50.3% of subjects reported that they participated in enrichment programming at a FBO site. Finally, the pool of subjects was comprised of adults, the majority of whom described themselves as African American. Specifically, 64.1% of subjects from the FBO sites and 56.4% from clinical sites reported that they were African Americans.

**Interpretation of Hypotheses and Recommendations**

**Comparison of Self-Efficacy Levels**

Data analysis from Hypothesis 1 demonstrated that there was no statistically significant difference in the level of self-efficacy between adults with type 2 diabetes who participated in a faith-based program than their counterparts who did not. To measure the difference in self-efficacy levels among the two study groups, the asymmetric version of the scale was administered as a means to circumvent what researchers (van der Bijl & Shortridge-Baggett, 2001) have identified as the “ceiling effect.” When such an effect is addressed, subjects are unlikely to perceive themselves as having a higher level of self-efficacy when questioned about their ability to perform self-management activities. Even though the asymmetric version of the self-efficacy instrument was administered to identify self-efficacy levels among the two groups, there
were no dissimilarities manifested. The Independent Sample $t$-test was the method of analysis used to examine if there was a difference in self-efficacy between the 2 groups.

Also, it can be assumed that no difference in self-efficacy was demonstrated between study groups due to the length of diagnosis and treatment for this chronic condition among subjects. As such, both the clinic subject pool (85.5%) and FBO (92.1%) subject pool specified that they had been diagnosed with type 2 diabetes for more than one year. Similarly, respondents noted that they had received treatment for their type 2 diabetes greater than one year in both the clinic (86.3%) and FBO (90.3%) groups. In this manner, it could be suggested that based on their responses to such items as those pertaining to eating healthy, and monitoring blood glucose levels, similar levels of self-efficacy were maintained as a result of having been diagnosed with diabetes longer than one year. Additionally, having received treatment longer than a year among the majority of respondents from both subject pools could have attributed to no difference in their self-efficacy level. In this context, it could be implied that the greater the length of diagnosis and treatment of this devastating condition influences the extent to which subjects maintain levels of confidence with their self-management care under varied circumstances.

Overall, self-management programs conducted within communities are interventions that can presumably supplement patients with the necessary knowledge, skills, and confidence to manage this devastating health condition (Marks et al., 2005). Such programs have been administered successfully in faith-based organizations where self-efficacy has been incorporated.
Contrary to the finding in analysis of Hypothesis 1 it would appear that since supplemental education was provided in a faith-based program there would be a difference in self-efficacy levels between the two groups. In this context, studies have demonstrated increased self-efficacy levels among patients diagnosed with diabetes mellitus. Nam and Song (2014) demonstrated that subjects recruited from clinics and churches reported having greater self-efficacy and perceived themselves as having fewer barriers in their insulin treatment regimen. Further, these researchers discussed that patients with strong self-efficacy can feel confident about their ability to manage their diabetes insulin treatment when combined with a relationship with their medical provider.

This study conducted by Nam and Song involved a diverse group of adult subjects diagnosed with type 2 diabetes for at least 7 years. Additionally, all study subjects took some form of prescribed diabetes oral medication as a way to prevent long-term and acute complications. In this study, findings revealed the patient provider relationship was associated with increased self-efficacy in self-management of this chronic condition (Nam & Song, 2014).

**Independent Variables as Predictors of Self-Efficacy**

In Hypothesis 1a, a multiple regression analysis was conducted to examine if attending a faith-based diabetes program after adjusting for demographic variables age, sex, education level, income, health insurance, and race/ethnicity was predictive of self-efficacy. With respect to Hypothesis 1a, attending a faith-based program was not a statistically significant predictor of the level of self-efficacy, after adjusting for selected demographics. Upon further examination, the final regression model revealed that age
was found to be statistically predictive of self-efficacy among study subjects. Additionally, health insurance was determined to be a potential predictor of self-efficacy since it remained in the final regression model.

Research (ADA, 2013a) has confirmed that age is a non-modifiable risk factor for diabetes mellitus among individuals as they mature. Specifically among minority populations, evidence has documented that between the years 2008–2009 people most commonly diagnosed with diabetes, were 20 years of age or older (ADA, 2015d). Further, findings from this study suggest that age influenced self-efficacy because as people with type 2 diabetes mature, they become more inclined to perform self-management behaviors (e.g., diet, glucose monitoring) with confidence. Particularly, as adults who have been diagnosed with this chronic illness for more than a year continue to grow older, it is possible that daily self-management behaviors are performed with confidence. To support the plausibility of this, the majority of clinic (58.1%) and FBO (49.2%) subjects reported their ages to be between 45 to 65 years. Additionally, the majority of study subjects reported having diabetes mellitus for more than a year in the clinic (85.5%) and FBO (92.1%) groups.

Considered as a self-managed disease that requires a range of self-management behaviors for optimal health, insurance coverage could support confidence for individuals to optimally monitor blood glucose levels, serving as a relief from the burden of associated expenses. In this context, health insurance could be attributed to one’s self-efficacy to better manage their type 2 diabetes since supplies including glucose meters and test strips are necessary for adequate management of blood glucose levels. In
this manner, expensive self-monitoring testing strips needed for testing blood glucose levels to achieve optimal glycemic control could contribute to substantial expense for individuals. According to the ADA (2012), blood glucose meters in some cases are free or can be purchased at a reduced cost. By contrast, long-term expenditures have been associated with blood glucose test strips. Costs for testing strips can amount to 50 cents to $1 per strip (e.g., testing five times a day is approximately $1,820/year). Particularly, health insurances cover some of the expenses associated with test strips. Coverage for expenses including the quantity of test strips can vary by insurer and type of diabetes mellitus. Often, insurance providers cover test strips and meters manufactured by a particular vendor. Additionally, test strips that are purchased must be compatible with the blood glucose meter for optimal accuracy of blood glucose measurements (ADA, 2012).

In this context, having public or private health insurance to supplement glucose supply costs to self-manage this condition has been associated with significantly lower hemoglobin A1C levels among patients (Bowker, Mitchell, Majumdar, Toth, & Johnson 2004). Among the clinic (53.8%) and FBO (53.3%) subject pools, the majority specified having public health insurance. It can be assumed that having some form of health insurance can enhance the self-efficacy of patients as a way to reduce the cost of necessary self-monitoring resources. As confirmed by Decker et al. (2013) and OMH (2014b), the accessibility to such resources can help people to better manage blood glucose levels with confidence.
**Comparison of Diabetes Self-Management Education**

Analysis of Hypothesis 2 revealed a statistically significant difference in diabetes self-management education (DSME; e.g., diet, physical activity, and glucose monitoring), between adults, particularly African American patients diagnosed with type 2 diabetes who attended faith-based education programs and their counterparts who did not. It was assumed that subjects would be less likely to receive DSME from clinicians than from supplemental enrichment received by participating in a FBO program. Contrary to this assumption, study findings revealed that the majority of clinic (83.0%) and FBO (88.9%) respondents reported that they received DSME from their clinicians. In this manner, under the premise that education can be attributed to self-efficacy of chronic disease self-management this study demonstrated the influence of diabetes self-management education (DSME).

Research has confirmed evidence consistent with findings in the present study. Sepers et al. (2015) found that an integrated, coordinated care model combined with DSME can be effective in reducing A1C blood levels among patients. This study revealed a statistically significant improvement in A1C levels among subjects who completed blood glucose testing at baseline and at 6 months. This intervention involved conducting DSME sessions once per month. Study activities included a DSME program with a patient-tailored curriculum that targeted the needs of an underserved population including access to health services, and practice changes focused on quality improvement of diabetes clinical care. Final analysis revealed an improvement in clinical health (A1C) outcomes that was associated with DSME activities conducted and managed consistently.
as part of clinical care (Sepers et al., 2015). As such, education is essential in management of this chronic condition. This is true of particularly DSME described as a collaboration among health professionals developed to assist patients to attain proficient skills that enable them to change behaviors and help manage this chronic illness (American Association of Diabetes Educators, 2015b; Funnell et al., 2008).

**Independent Variables as Predictors of DSME**

With respect to Hypothesis 2a, attending a faith-based program was a statistically significant predictor of diabetes self-management education, after adjusting for selected demographics. Specifically, age, income, and participation in a FBO diabetes education program were all predictive of diabetes self-management education. Interestingly, in this study, age was found to be predictive of self-efficacy and likewise predictive of diabetes self-management education. From the number of study subjects who reported participating in a FBO program, 33.8% were 65 years of age and older. Evidence (Funnell et al., 2008) has shown that culturally age-appropriate programs were effective with improving health outcomes among those most affected by this condition. Such findings also were confirmed by Peek et al. (2012). In this context, researchers found that when age was associated with culturally appropriate diabetes education programming and shared decision-making with a clinician, patients were successful in their self-management care. In this particular study the mean age reported among subjects was 61 years. Other demographic information revealed that the majority of subjects described themselves as African Americans. Importantly, 86% of the study subjects attended at least 70% of the classes offered by the program intervention. As such, there were notable
improvements also in diabetes self-efficacy. In this context, with the present study it can be suggested that as people mature with this condition they are likely to participate in a diabetes education program to assist with management of their type 2 diabetes.

Further analysis of Hypothesis 2a (see Table 11) revealed that income significantly predicted diabetes self-management education. People diagnosed with this health condition can experience financial constraints in their ability to afford necessary treatment to cover medical costs (Decker et al., 2013; Funnel et al., 2008). Particularly, in the present study one’s income can presumably create barriers for subjects to purchase necessary diabetes medication that can help them to successfully manage normal blood glucose levels. Consequently, participation in a faith-based intervention that provides some form of DSME can help offset expenses as a resource to learn about lifestyle changes to assist with self-managing this chronic condition. Consistent with research (Peek et al., 2012), the present study revealed lower annual income (less than $20,000) reported among the majority of clinic subjects (88.2 %) and FBO subjects (75.3%). In their study Peek et al. conducted an analysis among African American patients who participated in diabetes education intervention with annual household incomes of less than $15,000. Improvements were statistically significant in hemoglobin A1C measurements upon completion of a DSME program. Additionally, subjects reported better self-management with eating healthier, glucose monitoring and performing foot exams. The diabetes curriculum administered in the study was tailored to accommodate the socioeconomic status and cultural background of program subjects. As such the curriculum included nutrition education and recommendations for physical activity
offered in six sessions on a weekly basis. Retention of subjects in the intervention was considerable, as subjects attended at least 50% of the education sessions offered.

Additional findings from Hypothesis 2a indicated that participation in a FBO diabetes education program significantly predicted diabetes self-management education (e.g., diet physical activity, glucose monitoring). Consistent with the body of research (Hoyo et al., 2004) faith-based organizations are considered accepted and trusted partners in recruiting participants for health related discussions. In this manner such program interventions are educational opportunities where new information can be disseminated to address the disparity of type 2 diabetes. As such, there has been notable success with the adoption of lower-fat diets and increased physical activity among African-Americans, who participate in faith-based health-promotion activities (Hoyo et al., 2004). Parallel to this study, Collins-McNeil et al. (2012) demonstrated that innovative approaches such as faith-based diabetes self-management interventions have been effective with improved health outcomes among African American adults diagnosed with type 2 diabetes. In their study researchers found there were statistically significant improvements with medication compliance, foot care and healthier eating behaviors among subjects. To supplement diabetes care management among adult African-Americans, participation in a faith-based DSME programs can be essential with enhancing self-management activities and consequently help to reduce the disparity of diabetes mellitus among those most affected (Davis-Smith, 2007).
Relationships Between Dependent Variables

The analysis outcomes from Hypothesis 3 demonstrated there was a positive relationship \((r = 0.26)\) between diabetes self-management education and self-efficacy among study subjects who responded having received diabetes education from a medical provider and a FBO program. Relative to this finding a primary focus of self-management education programming is the enhancement of an individual’s self-confidence through varied learning activities (Marks et al., 2005). Self-management education programming has demonstrated positive health outcomes attributed to self-efficacy. In this context engaging in self-management activities such as eating healthy and regular exercise can help those affected to better manage this chronic health condition with confidence. Bandura (2004) further explained that self-management activities rooted in self-efficacy can increase people’s adherence to self-managing health behaviors.

As an outcome of the present study and consistent with previous studies (Peek et al., 2012) self-management education can positively enhance one’s self-efficacy to perform specific behaviors to manage this devastating chronic condition. Evidence (Peek et al., 2012) has confirmed that diabetes self-efficacy correlates with self-management education associated with clinical outcomes such as a glycemic control. Peek et al. examined a culturally competent educational intervention that empowered African-American patients to self-manage their type 2 diabetes while making informed health care decisions. Upon completion of the education program self-confidence was demonstrated among adult African American subjects in their decision-making about their self-management behaviors. Diabetes self-efficacy and self-management behaviors
were notably improved. Patients reported they had more confidence in their ability to perform their diabetes care to manage this chronic condition. Subjects improved their self-glucose monitoring, foot care, and healthy dietary habits. As such, statistical significance was revealed with self-care behaviors associated with self-efficacy.

Additionally, physical activity gradually increased over time.

Further analysis of Hypothesis 3 was conducted to test the relationship between diabetes self-management education and self-efficacy among the clinic and FBO subject pools. In this manner, findings from Null Hypothesis 3a with respect to the clinic sample revealed there was no statistically significant relationship between diabetes self-management education and self-efficacy among those who did not participate in a faith-based program. Similarly, in the final analysis of Null Hypothesis 3b with the FBO sample, findings showed no statistically significant relationship between diabetes self-management education and self-efficacy among those who did participate in a faith-based program. In context with the findings from both groups, it could be suggested that in the separate analysis of the two subject pools the small sample size was not sufficient enough to demonstrate statistically significant power to detect a relationship between diabetes self-management education and self-efficacy.

Recommendations for Future Research, Health Education, Public Health, and Advocacy

Marks et al. (2005) in their analysis of enhancing one’s self-efficacy through self-management recommended that medical providers should address any lack of confidence relative to performing specific behaviors recognized among their patients. In
this context, factors such as sufficient income and having health care insurance should be taken into consideration when assessing one's self-efficacy. Such factors present decision making barriers that can dissuade individuals from achieving health-promoting behaviors such as taking medications as prescribed. Peek et al. (2012) confirmed the lack of shared decision-making that involves education between clinicians and African-Americans with diabetes can present obstacles with the level of self-efficacy necessary for successful diabetes self-management. In this context it is suggested that discussions take place between clinician and patient that include creating a plan that can help to address barriers to self-manage diabetes care with confidence. When patients and physicians create diabetes self-care plans together, patients are more likely to make needed lifestyle changes to manage their condition (Peek et al., 2012). Furthermore, opportunities should be explored as to how medical providers and health educators can collaborate to plan educational strategies that incorporate and enhance self-efficacy through DSME among patients diagnosed with type 2 diabetes.

With respect to health education programming conducted in faith-based organizations, positive lifestyle changes such as increased physical activity and improved clinical outcomes (e.g., glucose monitoring, A1C levels) have been achieved (Davis-Smith, 2007). However, Hoyo et al. (2004) recognized that numerous health promotion interventions continue to occur increasingly among faith-based organizations. For some congregations such programming is new but an educational opportunity to address health issues. In this manner, successful adoption and implementation of DSME programming may not always occur as intended. Evidence has revealed slow progress with achieving
intended program outcomes partly due to a lack of knowledge among African Americans about health conditions for which interventions have been designed (Hoyo et al., 2004). Furthermore, such interventions are generally researcher initiated. In this context, it has been suggested that health promotion interventions are not structured in a manner that enables congregations to evaluate their efficacy to adopt and importantly, sustain such programming (Hoyo et al., 2004). Subsequently, only minimal reduction in the prevalence and mortality of chronic disease conditions such as diabetes mellitus have been demonstrated as a result of such community health education and promotion venues.

In an effort to increase the effectiveness of community health promotion interventions a recommended strategy for health educators and public health professionals is to develop more structured or formal diabetes self-management education program among faith-based organizations. Research suggests individual FBO programs serve relatively small groups of people with respect to their health issues. As such, an organized network of FBO programs can potentially extend their reach to more people who are most affected by this devastating condition (Asomugha, Derose, & Lurie, 2011). A national FBO research network could serve as a foundation for developing and evaluating community-based approaches that enhance quality of life and eliminate disparities such as type 2 diabetes (Asomugha et al., 2011). There are limited platforms that have linked FBOs together which are engaged in health interventions that permit the necessary exchange of concepts or program analyses in health promotion efforts. Subsequently, a national faith-based health research network could provide such
structure. Goals for a national faith-based health research network to ensure support and sustainability have been recommended (Asomugha et al., 2011):

1. Expansion of FBO capacity for research and evaluation
2. Contribution of new information about best practices in FBO settings
3. Widespread dissemination of findings through a FBO network.

Program planning, implementation, and evaluation opportunities should be pursued by health educators and public health professionals to increase the number of congregation members or faith-based leaders who are trained to educate or coordinate DSME programs. Importantly, incorporated in the training should be an ongoing evaluation process that can guide church members and leaders on how to assess if program goals have been achieved to ensure sustainability of the program once adopted.

In context with the present study, programs were primarily coordinated by volunteers. Volunteers for the most part spend the majority of their time distributing or replenishing resources to serve people attending the programs.

Further, the institution of the Black church with respect to administration of health promotion programs traditionally has been sustained largely by volunteers. Evidence suggests (Thomas, Quinn, Billingsley, and Caldwell, 1994) that the availability of paid clergy and other paid staff are necessary to provide consistent oversight to various programs that can determine the extent to which faith-based organizations can continue the provision of community health outreach programs. Consistent with findings from the present study research suggest health professionals who are church members could be a
resource and provide the necessary expertise to mobilize a network of staff to guide and implement community health programs (Thomas et al., 1994).

Collaboration among public health professionals and faith-based communities is needed strategy to advocate for the alignment of sufficient resources for FBO education. In this context, populations most affected are better served by minimizing associated costs with diabetes management and care. As such, opportunities to seek grant funding associated with diabetes prevention programming should be considered. In this context, through the Affordable Care Act, the CDC Community Transformation Grants Program in 2011, provided funding to support the dissemination and evaluation of evidence-based community preventive health activities. The purpose of such funded programming was to help reduce the prevalence of chronic conditions such as diabetes mellitus by addressing risk factors that included poor nutrition and physical inactivity (USDHHS, 2011). In this manner, such funding could help to secure necessary program resources (e.g., instructors, literature) to train church leaders and members that can enable them to effectively disseminate and evaluate diabetes prevention programs.

With respect to legislation enacted through the Affordable Care Act provisions for free preventive diabetes care and treatment is covered (AADE, 2014):

- “Diabetes screenings for adults diagnosed with high blood pressure”
- “Diabetes screenings for pregnant women”
- “Medical nutrition therapy for people with diabetes (state dependent)”
- “Annual wellness visits to develop (or update) personal prevention plans for Medicare participants.” (AADE, 2014)
Importantly, beginning Sept. 23, 2010, under the Affordable Care Act, insurance coverage for people diagnosed with diabetes or who need treatment for a diabetes-related complication will not be cancelled as result of a diagnosis with this chronic condition or any related complications (National Conference of State Legislatures [NCSL], 2011).

In summary, with respect to the main contribution of this study to the current body of research is a better understanding of the influence from types of education programming received and scope of diabetes self-management education. Importantly, analyses of data in this study revealed a positive relationship between diabetes self-management education and self-efficacy among both subject groups. As such, this relationship was demonstrated among subjects who did participate in a FBO as well as their counterparts who did not. Furthermore, the analysis of this study suggested that self-efficacy was not influenced by attending or not attending a FBO among subjects.

**Study Limitations: Data Collection Process**

Limitations in the breadth of study findings, data analysis, and interpretation and the ability to draw inferences from the findings can be attributed to the small sample size. In specific, while the proposed sample size of $N = 200$ was anticipated to be reached from both clinic and FBO subject pools for this study, the total number of subjects of whom final data were collected was 157. In this context, recruitment of subjects was sometimes a challenge at both the FBO and clinical sites. During recruitment and data collection an additional limitation revealed that not all people who attended the FBO programming had a diagnosis of type 2 diabetes. Also, despite information shared by programmers potential subjects revealed willingly they had never been screened or were unaware if
they had this chronic condition. In such cases data were not collected from these individuals. Additionally, the faith-based organizations simultaneously conducted DSME programming while providing other activities (e.g., grocery shopping, meals, screenings) to address the needs of all people attending the program. As such, the primary reason some potential subjects attended a FBO program was the opportunity to access the variety of services being offered at specific sites. In this context, some of the applied programming was organized such that people were assigned numbers that enabled them to participate in program activities offered at particular sites. When one’s number was called by program coordinators individuals were required to participate in designated program activities or they would forfeit their opportunity to participate. In the future additional research staff would be helpful to monitor the flow of program activities for management of subject recruitment.

Similarly, recruitment at the clinical sites was challenging. Administration of the instrument was time sensitive. In most cases, once subjects agreed to respond to instrument items they were able to complete the items prior to being roomed for their schedule appointment. In other cases on days when the patient waiting area was crowded, it was a challenge for subjects to complete all instrument items prior to being roomed for their scheduled appointment. The researcher was equally challenged with subject recruitment on such days to ensure she did not disrupt patient flow in the crowded waiting area.

Importantly, it was the intent of this study to collect data from adult African Americans diagnosed with type 2 diabetes from both the clinic and FBO groups. During
data collection the two subject pools were comprised of a diverse group that included a majority but not exclusively African Americans. In this context the pool of respondents from whom final data were gathered consisted of racially diverse subjects.

With respect to the instrument some FBO subjects provided feedback to the researcher that the length of the instrument was too long in regard to the limited amount of time they had to complete the instrument. For some this could have been a deterrent to completing all instrument items. In this manner, time was a critical factor enabling subjects to take part in program activities being offered. It could be surmised that subjects did not take time to understand specific instrument items about education received and self-efficacy.

Finally, the self-efficacy instrument was administered in this study with the assumption that attending a FBO program and demographic variables were predictive of self-efficacy. In this context attending a FBO was not predictive of self-efficacy. Comparatively, age and health insurance were suggested as being predictive of self-efficacy. It can be assumed that the self-efficacy instrument items in this context were not sensitive enough or too general for this particular study relative to study findings.
APPENDICES
APPENDIX A

FINAL STUDY IRB APPROVAL
Appendix A

Final Study IRB Approval

Kent State University Mail - Protocol #13-458 - Exemption 2.


Washko, Paulette <pwashko@kent.edu>
To: TERRI ROBINSON <terobins@kent.edu>

Terri,

Thank you for sending these documents. Should you have changes to your study in the future, please submit an amendment form with the documents to Researchcompliance@kent.edu. The form is available at http://www.kent.edu/research/researchsafetyandcompliance/irtq/institutional-review-board-forms.cfm

Nothing further for you to do for these changes. Thank you and best of luck with your study.

Paulette

From: TERRI ROBINSON [mailto:terobins@kent.edu]
Sent: Monday, March 31, 2014 8:21 AM
To: RAGS Research Compliance: Washko, Paulette

[Quoted text hidden]
APPENDIX B

CLINIC SITE AUTHORIZATION LETTERS
Appendix B

Clinic Site Authorization Letters

October 2, 2013

Kele Ding, Ph.D. (Principal-Investigator)
Associate Professor
Health Education & Promotion
Kent State University
PO Box 5190, 142 Nixon Hall
Kent, OH 44242

Re: Site Authorization Letter

Dear Dr. Ding:

I have reviewed your request regarding your study and am pleased to support your research project entitled “An analysis of the influence of the type of diabetes education and self-management programming on self-efficacy among adult African Americans with type 2 diabetes.” Your request to use Summa Health System as a research or recruitment site is granted. The research will include obtaining informed consent and administration of the diabetes questionnaire instrument to participants within the institution. This authorization covers the time period of 10/01/2013 to 08/31/2014. We look forward to working with you.

Most sincerely,

Joseph Saracco, M.D., F.A.C.P.
System V.P. President, Medical Education
Chief Academic Officer

JZ/wmh
April 24, 2014

Kele Ding, PhD (Principle-Investigator)
Associate Professor
Health Education & Promotion
Kent State University
PO Box 5190,
142 Nixson Hall
Kent, OH 44242

Re: Site Authorization Letter

Dear Dr. Kele Ding:

I have reviewed your request regarding your study and am pleased to support your research project entitled “An analysis of the influence of the type of diabetes education and self-management programming on self-efficacy among adult African Americans with type 2 diabetes.” Your request to use Summa Health System as a research or recruitment site is granted. The research will include obtaining informed consent and administration of the diabetes questionnaire instrument to participants within the institution. This authorization covers the time period of 05/01/2014 to 10/28/2014.

We look forward to working with you. Please contact me if I may be of assistance in completing this project.

Sincerely,

Roxia B. Boykin, MPA, RN
Vice President
Community Benefit & Diversity
Summa Health System
234-312-5256
boykinr@summahealth.org

RBB/clb
APPENDIX C

FAITH-BASED ORGANIZATION LETTERS OF SUPPORT
Appendix C

Faith-Based Organization Letters of Support

Kale Ding, PhD, (Principal Investigator)
Associate Professor
Health Education and Promotion
Kent State University
PO Box 5190, 142 Nisson Hall
Kent, OH 44242

Re: Site Authorization Letter
Dear Dr. Ding

I have reviewed your request regarding your study and I am pleased to support your research project entitled "An analysis of the influence of the type of diabetes education and self management programming on self-efficacy among adult African Americans with Type 2 diabetes." Your request to use the Monica E. Gardner Legacy Diabetes Ministry as a research or recruitment site is granted. The research will include obtaining informed consent and administration of the diabetes questionnaire instrument to participants within this initiative. This authorization covers the time period of 10/01/2013 to 08/31/2014. We look forward to working with you.

Sincerely,

Sheel A. Missimi, PhD, RN

Sally A. Missimi, PhD, RN
Director, Community Benefit
Summa Health System
KENT STATE

Kent State Student - Terri
2 messages

TERRI ROBINSON <tarobins@kent.edu>
To: afote@friendlyinn.org

Tue, Nov 26, 2013 at 7:02 AM

Good morning Ms. Foote,
Thank you again for your time and allowing be to visit FISH. I was able to arrange around my job to attend the community dinner this evening. If I arrive around 5:30 pm this evening will that be all right? I look forward to meeting you and an opportunity to visit your facility.

Warm regards,
Terri
Kent State University

afote@friendlyinn.org <afote@friendlyinn.org>
Reply-To: "afote@friendlyinn.org" <afote@friendlyinn.org>
To: TERRI ROBINSON <tarobins@kent.edu>

Tue, Nov 26, 2013 at 11:24 AM

Good Morning Terri,

That is great I will see you this evening at 5:30p

Andrea Foote
Supervisor - System of Care
Friendly Inn Settlement House
2386 Unwin Road
Cleveland, OH 44104
Email: afote@friendlyinn.org
P: 216-431-7656 F: 216-431-8189

Friendly Inn Settlement, Inc. is now on Facebook, please like us today or check out our website: www.friendlyinn.org.

This message (including any attachments) contains confidential information intended for a specific individual and purpose, and is protected by law. If you are not the intended recipient, you should delete this message. Any disclosure, copying, or distribution of this message, or the taking of any action based on it, is strictly prohibited.
09/26/2013

Terri E. Robinson (Co-Investigator)
Kent State University
Kent, OH 44240

Re: Site Authorization Letter

Dear Terri Robinson:

I have reviewed your request regarding your study and am pleased to support your research project entitled “An analysis of the influence of the type of diabetes education and self management programming on self-efficacy among adult African Americans with type 2 diabetes.” Your request to use Mill Creek Community Center, Third Baptist Church as a research or recruitment site is granted. The research will include obtaining informed consent and administration of the diabetes questionnaire instrument to participants within the institution. This authorization covers the time period of 10/01/2013 to 02/28/2014. We look forward to working with you.

Sincerely,

[Signature]

June Ewing
Nutrition Educator
05/25/2014

Terri Robinson, MPH (Co-Investigator)
Doctoral Candidate
Health Education & Promotion
Kent State University
PO Box 5190,
142 Nixson Hall
Kent, OH 44242

Re: Site Authorization Letter

Dear Terri:

I have reviewed your request regarding your study and am pleased to support your research project entitled “An analysis of the influence of the type of diabetes education and self management programming on self-efficacy among adult African Americans with type 2 diabetes.” St. Paul’s Community Meal Sunday as a research site is granted. The research will include obtaining informed consent and administration of the diabetes questionnaire instrument to participants within the organization. This authorization covers 05/25/2014 and 06/29/2014.

Sincerely,

[Signature]

[Name]

St. Paul’s UCC Community Church
4727 Franklin
Cleveland, OH 44113
07/2/2014

Terri Robinson, MPH (Co-Investigator)
Doctoral Candidate
Health Education & Promotion
Kent State University
PO Box 5190,
142 Nixson Hall
Kent, OH 44242

Re: Site Authorization Letter

Dear Terri:

I have reviewed your request regarding your study and am pleased to support your research project entitled “An analysis of the influence of the type of diabetes education and self-management programming on self-efficacy among adult African Americans with type 2 diabetes.” St. John C.M.E. Church as a research site is granted. The research will include obtaining informed consent and administration of the diabetes questionnaire instrument to participants who attend.

Sincerely,

[Signature]
St. John C.M.E Church
Akron, OH
Lorain Christian Temple
(Disciples of Christ)

Mailing address: P.O. Box 840, Physical address: 940 West Fifth Street
Lorain, Ohio 44052
Rev. Dr. Bradley J. Donahue, Pastor
1-440-244-5883
www.lctdisciples.org
pastor@lctdisciples.org

06/12/2014

Terri Robinson, MPH (Co-Investigator)
Doctoral Candidate
Health Education & Promotion
Kent State University
PO Box 5190,
142 Nixson Hall
Kent, OH 44242

Re: Site Authorization Letter

Dear Terri:

I have reviewed your request regarding your study and am pleased to support your research project entitled “An analysis of the influence of the type of diabetes education and self management programming on self-efficacy among adult African Americans with type 2 diabetes.” Your request to use Christian Temple as a research or recruitment site is granted. The research will include obtaining informed consent and administration of the diabetes questionnaire instrument to participants within the organization.

Sincerely,

[Signature]

The Reverend Dr. Bradley J. Donahue, D. Min., Pastor
08/16/2014

Terri Robinson, MPH (Co-Investigator)
Doctoral Candidate
Health Education & Promotion
Kent State University
PO Box 5190,
142 Nixson Hall
Kent, OH 44242

Re: Site Authorization Letter

Dear Terri Robinson:

I have reviewed your request regarding your study and am pleased to support your research project entitled “An analysis of the influence of the type of diabetes education and self management programming on self-efficacy among adult African Americans with type 2 diabetes.” The True Vine Missionary Baptist Church as a research site is granted. The research will include obtaining informed consent and administration of the diabetes questionnaire instrument to participants who attend the community outreach event.

Sincerely,

[Signature]

Diane Cransfield
Cleveland, OH 44168
APPENDIX D

PILOT STUDY INSTRUMENT INCLUDING SYMMETRIC SELF-EFFICACY SCALE
Appendix D

Pilot Study Instrument Including Symmetric Self-Efficacy Scale

<table>
<thead>
<tr>
<th>Section I. Demographic questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How would you describe yourself?</td>
</tr>
<tr>
<td>- African American/Black</td>
</tr>
<tr>
<td>- White/Caucasian</td>
</tr>
<tr>
<td>- Latino</td>
</tr>
<tr>
<td>- Asian</td>
</tr>
<tr>
<td>- Native American</td>
</tr>
<tr>
<td>2. What is your sex?</td>
</tr>
<tr>
<td>- Female</td>
</tr>
<tr>
<td>- Male</td>
</tr>
<tr>
<td>3. What is your age?___</td>
</tr>
<tr>
<td>4. What is your marital status?</td>
</tr>
<tr>
<td>- Single</td>
</tr>
<tr>
<td>- Divorced</td>
</tr>
<tr>
<td>- Married</td>
</tr>
<tr>
<td>5. What type of health insurance do you have?</td>
</tr>
<tr>
<td>- Private</td>
</tr>
<tr>
<td>- Public</td>
</tr>
<tr>
<td>- Other</td>
</tr>
<tr>
<td>- None</td>
</tr>
<tr>
<td>6. What is your income?</td>
</tr>
<tr>
<td>- Less than $20,000</td>
</tr>
<tr>
<td>- $20,000–$40,000</td>
</tr>
<tr>
<td>- $40,000–$60,000</td>
</tr>
<tr>
<td>- Greater than $60,000</td>
</tr>
<tr>
<td>7. How long have you been diagnosed with type 2 diabetes?</td>
</tr>
<tr>
<td>- Less than 1 year</td>
</tr>
<tr>
<td>- Greater than 1 year</td>
</tr>
<tr>
<td>8. Are you taking your Insulin and/or diabetes medication as prescribed?</td>
</tr>
<tr>
<td>- Yes</td>
</tr>
<tr>
<td>- Some of the time</td>
</tr>
<tr>
<td>9. How long have you been receiving treatment (medication) for your diabetes?</td>
</tr>
<tr>
<td>- Less than 1 year</td>
</tr>
<tr>
<td>- Greater than 1 year</td>
</tr>
<tr>
<td>10. Do you have chronic illnesses other than diabetes?</td>
</tr>
<tr>
<td>- Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section II. Education questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. What level of education have you completed?</td>
</tr>
<tr>
<td>- Some high school</td>
</tr>
<tr>
<td>- High school graduate or GED</td>
</tr>
<tr>
<td>- Some college</td>
</tr>
<tr>
<td>- College graduate</td>
</tr>
<tr>
<td>12. How often in the last 12 months have you visited a doctor for your diabetes?</td>
</tr>
<tr>
<td>- More than once a month</td>
</tr>
<tr>
<td>- Monthly</td>
</tr>
<tr>
<td>- 1 – 4 times per year</td>
</tr>
<tr>
<td>- 1 – 2 times per year</td>
</tr>
<tr>
<td>- Not visited doctor(s) in the last 12 months</td>
</tr>
<tr>
<td>13. How often did you receive education [e.g. One-on-one or group] from your doctor about diabetes during your doctor visit in the past 12 months?</td>
</tr>
<tr>
<td>- Never</td>
</tr>
<tr>
<td>- Almost never</td>
</tr>
<tr>
<td>- Sometimes</td>
</tr>
<tr>
<td>- Usually</td>
</tr>
<tr>
<td>- Almost always</td>
</tr>
<tr>
<td>- Always</td>
</tr>
<tr>
<td>14. What education did you receive from your doctor about your diabetes (check all that apply)?</td>
</tr>
<tr>
<td>- Exercise</td>
</tr>
<tr>
<td>- Diet</td>
</tr>
<tr>
<td>- Foot exam</td>
</tr>
<tr>
<td>- Taking medications</td>
</tr>
<tr>
<td>- Education (ex. One-on-one or group)</td>
</tr>
<tr>
<td>- Blood pressure</td>
</tr>
<tr>
<td>- Hemoglobin A1c</td>
</tr>
<tr>
<td>- Cholesterol</td>
</tr>
<tr>
<td>- Blood glucose check</td>
</tr>
<tr>
<td>15. How often did you participate in a diabetes support group when recommended by your doctor in the past 12 months?</td>
</tr>
<tr>
<td>- Never</td>
</tr>
<tr>
<td>- Less than once a month</td>
</tr>
<tr>
<td>- Once a month</td>
</tr>
<tr>
<td>- More than once a month</td>
</tr>
</tbody>
</table>

Terri Robinson, Doctoral Student, Kent State University
An analysis of the influence of the type of diabetes education and self-management training on self-efficacy among adult African Americans with type 2 diabetes.

16. Have you ever participated in a church or faith-based education program for your diabetes in the past 12 months?
   ○ Yes
   ○ No

17. How long have you participated in the church or faith-based program in total?
   ○ Less than 1 year
   ○ Greater than 1 year

18. How often did you attend the church or faith-based program in the last 12 months?
   ○ Never
   ○ Less than once a month
   ○ Once a month
   ○ More than once a month

19. What education did you receive at the church or faith-based program (check all that apply)?
   ○ Exercise
   ○ Diet
   ○ Foot exam
   ○ Taking medications
   ○ Education (ex. One-on-one or group)
   ○ Blood pressure
   ○ Hemoglobin A1c
   ○ Cholesterol
   ○ Blood glucose check

20. How often did you participate in a diabetes support group when you attended the church or faith-based program?
   ○ Never
   ○ Less than once a month
   ○ Once a month
   ○ More than once a month

21. What activities do you participate in to take care of your diabetes (Check all that apply)?
   ○ Exercise
   ○ Diet
   ○ Foot exam
   ○ Taking medications
   ○ Education (ex. One-on-one or group)
   ○ Blood pressure
   ○ Hemoglobin A1c
   ○ Cholesterol
   ○ Blood glucose check

22. How often did you participate in these activities to care for your diabetes in a week?
   ○ Never
   ○ Less than once per week
   ○ Once a week
   ○ More than once a week
   ○ Daily

Section III. Self-efficacy Type 2 diabetes questions: Please answer each question by checking one answer that describes how convinced you are in managing your diabetes.

<table>
<thead>
<tr>
<th>Question</th>
<th>Definitely Yes</th>
<th>Probably Yes</th>
<th>Probably Not</th>
<th>Definitely Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>23 I am able to adjust my diet when I am under stress or tension.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 I am able to visit the doctor regularly to monitor my diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 I am able to take my medicine as prescribed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 I am able to adjust my medication when I am ill.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 I am able to check my blood sugar if necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28 I am able to correct my blood sugar when the blood sugar value is</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>too high.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29 I am able to correct my blood sugar when the blood sugar value is</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>too low.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 I am able to select the right foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 I am able to select different foods but stay within my diet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>recommended for my diabetes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Terri Robinson, Doctoral Student, Kent State University
**Pilot Study Instrument**

*Including Symmetric Self-efficacy Scale*

An analysis of the influence of the type of diabetes education and self-management programming on self-efficacy among adult African Americans with type 2 diabetes.

<table>
<thead>
<tr>
<th></th>
<th>Definitely Yes</th>
<th>Probably Yes</th>
<th>Probably Not</th>
<th>Definitely Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>I am able to keep my weight under control.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>33</td>
<td>I am able to examine my feet for skin problems.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>34</td>
<td>I am able to perform sufficient physical activities (ex. walking or biking).</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>35</td>
<td>I am able to adjust my diet most of the time.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>36</td>
<td>I am able to follow my diet most of the time.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>37</td>
<td>I am able to perform extra physical activities, when the doctor advises me to do so.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>38</td>
<td>When performing extra physical activities, I think I am able to adjust my diet.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>39</td>
<td>I am able to follow my diet when I am away from home.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>40</td>
<td>I am able to adjust my diet when I am away from home.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>41</td>
<td>I am able to follow my diet when I am on vacation.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>42</td>
<td>I am able to follow my diet when I am at a reception or party.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

If you are taking medications for your diabetes please answer the next two questions. If not, you are done.

43. I am able to take my medicine as prescribed.
   - Definitely Yes
   - Probably Yes
   - Probably Not
   - Definitely Not

44. I am able to adjust my medication when I am ill.
   - Definitely Yes
   - Probably Yes
   - Probably Not
   - Definitely Not

Thank you!

Terri Robinson, Doctoral Student, Kent State University
APPENDIX E

PILOT STUDY INSTRUMENT INCLUDING ASYMMETRIC SELF-EFFICACY SCALE
Appendix E

Pilot Study Instrument Including Asymmetric Self-Efficacy Scale

Section I. Demographic questions
1. How would you describe yourself?
   - African American/Black
   - White/Caucasian
   - Latino
   - Asian
   - Native American

2. What is your sex?
   - Female
   - Male

3. What is your age? _____

4. What is your marital status?
   - Single
   - Married
   - Divorced

5. What type of health insurance do you have?
   - Private
   - Public
   - Other
   - None

6. What is your income?
   - Less than $20,000
   - $20,000-$40,000
   - $40,000-$60,000
   - Greater than $60,000

7. How long have you been diagnosed with type 2 diabetes?
   - Less than 1 year
   - Greater than 1 year

8. Are you taking your insulin and/or diabetes medication as prescribed?
   - Yes
   - Some of the time

9. How long have you been receiving treatment (medication) for your diabetes?
   - Less than 1 year
   - Greater than 1 year

10. Do you have chronic illnesses other than diabetes?
    - Yes
    - No

11. What level of education have you completed?
    - Some high school
    - High school graduate or GED
    - Some college
    - College graduate

Section II. Education questions
12. How often in the last 12 months have you visited a doctor for your diabetes?
    - More than once a month
    - Monthly
    - 3-4 times per year
    - 1-2 times per year
    - Not visited doctor(s) in the last 12 months

13. How often did you receive education (ex. One-on-one or group) from your doctor about diabetes during your doctor visit in the past 12 months?
    - Never
    - Almost never
    - Sometimes
    - Usually
    - Almost always
    - Always

14. What education did you receive from your doctor about your diabetes (check all that apply)?
    - Exercise
    - Diet
    - Foot exam
    - Taking medications
    - Education (ex. One-on-one or group)
    - Blood pressure
    - Hemoglobin A1c
    - Cholesterol
    - Blood glucose check

15. How often did you participate in a diabetes support group when recommended by your doctor in the past 12 months?
    - Never
    - Less than once a month
    - Once a month
    - More than once a month

Terri Robinson, Doctoral Student, Kent State University
Section III. Self-efficacy Type 2 diabetes questions: Please answer each question by checking one answer that describes how convinced you are in managing your diabetes

<table>
<thead>
<tr>
<th>Question</th>
<th>Certainly</th>
<th>Most</th>
<th>Maybe</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>23 I am able to adjust my diet when I am under stress or tension.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>24 I am able to visit the doctor regularly to monitor my diabetes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25 I am able to take my medicine as prescribed.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26 I am able to adjust my medication when I am ill.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>27 I am able to check my blood sugar if necessary.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>28 I am able to correct my blood sugar when the blood sugar value is too high.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>29 I am able to correct my blood sugar when the blood sugar value is too low.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30 I am able to select the right foods.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Terri Robinson, Doctoral Student, Kent State University
An analysis of the influence of the type of diabetes education and self-management programming on self-efficacy among adult African Americans with type 2 diabetes

<table>
<thead>
<tr>
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<th>Maybe, Maybe Not</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>31. I am able to select different foods but stay within my diet recommended for my diabetes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>33. I am able to examine my feet for skin problems.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. I am able to adjust my diet most of the time.</td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If you are taking medications for your diabetes please answer the next two questions. If not, you are done.

43. I am able to take my medicine as prescribed.
   - Certainly
   - Most Probably
   - Maybe, Maybe Not
   - Unlikely

44. I am able to adjust my medication when I am ill.
   - Certainly
   - Most Probably
   - Maybe, Maybe Not
   - Unlikely

Thank you!

Terri Robinson, Doctoral Student, Kent State University
APPENDIX F

IRB PILOT STUDY APPROVAL
Appendix F

IRB Pilot Study Approval

Kent State University Mail - IRB Level I, category 2 approval for Protocol application #1...  Page 1 of 2

KENT STATE

TERRI ROBINSON <terobins@kent.edu>

IRB Level I, category 2 approval for Protocol application #13-458 - please retain this email for your records
3 messages

Thu, Oct 10, 2013 at 3:52 PM

RAGS Research Compliance <researchcompliance@kent.edu>
To: "DING, KELE" <kding@kent.edu>, "terobins@kent.edu" <terobins@kent.edu>

RE: Protocol #13-458 - entitled "An analysis of the influence of the type of diabetes education and self management programming on self-efficacy among adult African Americans with type 2 diabetes"

The Kent State University Institutional Review Board has reviewed and approved your Application for Approval to Use Human Research Participants as Level I/Exempt from Annual review research. Your research project involves minimal risk to human subjects and meets the criteria for the following category of exemption under federal regulations:

- Exemption 2: Educational Tests, Surveys, Interviews, Public Behavior Observation

This application was approved on October 8, 2013.

***Submission of annual review reports is not required for Level I/Exempt projects.

If any modifications are made in research design, methodology, or procedures that increase the risks to subjects or includes activities that do not fall within the approved exemption category, those modifications must be submitted to and approved by the IRB before implementation.

Please contact an IRB discipline specific reviewer or the Office of Research Compliance to discuss the changes and whether a new application must be submitted.

http://www.kent.edu/research/researchsafetyandcompliance/irb/index.cfm

Kent State University has a Federal Wide Assurance on file with the Office for Human Research Protections (OHRP); FWA Number 00003823.
APPENDIX G

SCRIPT TO SUBJECTS (PILOT/FINAL STUDY)
Kent State University
www.kent.edu

Graduate Student Script for Diabetes Study Participants

My name is Terri Robinson. I am a Kent State University graduate student in the Health Education and Promotion program. The purpose of this questionnaire is to analyze the influence of the type of community diabetes education and self-management programming among adults diagnosed with type 2 diabetes. I ask that you take a few moments to complete this brief questionnaire about your type 2 diabetes. Your responses are completely confidential and will be returned to me without any individual identifying information. Your participation and responses to the questionnaire will help me to better understand and evaluate diabetes education and self-management programming among people living with type 2 diabetes in our community.
APPENDIX H

CONSENT FORM (PILOT/FINAL STUDY)
Appendix H

Consent Form (Pilot/Final Study)

Kent State University
www.kent.edu

Informed Consent to Participate in a Diabetes Research Study

Greetings,

My name is Terri Robinson. I am a Kent State University graduate student in the Health Education and Promotion program. This is an invitation for you as a valued member in the community to participate in a research study for type 2 diabetes.

Have you ever been told you have or diagnosed with type 2 diabetes?

- No
- Yes

If you answered No we thank you for your time and have a good day!
If you answered Yes, please proceed with reading instructions carefully to respond to the study questionnaire

We ask that you take a few moments to complete this brief questionnaire about your type 2 diabetes. Your responses are completely confidential and will be returned to me without any individual identifying information. The purpose of this questionnaire is to analyze the influence of the type of community diabetes education and self-management programming among adults diagnosed with type 2 diabetes. Your participation and responses to the questionnaire will help me to better understand and evaluate diabetes education and self-management programming among people living with type 2 diabetes in our community.

Participation in this survey is completely voluntary and takes about 20 minutes or less to complete. Please answer all questions and be assured that all of your responses will be kept confidential. A hardcopy of your responses will be kept in a locked file then entered into an electronic database that will have a password protected login. You may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled.

If you have any questions about this questionnaire please contact Kele Ding, PhD Principal Investigator at (330) 672-0688 or by e-mail at kdina@kent.edu or Terri Robinson, Kent State Graduate Student, at (330) 524-8547 or by e-mail at terrirobinson@kent.edu. If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330.672.2704

I have read this consent form and had the opportunity to have my questions answered to my satisfaction. I voluntarily agree to participate in this study. I understand that a copy of this consent will be provided to me for future reference.

__________________________  __________________________
Signature                  Date

Thank you for your time and have a good day!
APPENDIX I

FINAL INSTRUMENT INCLUDING ASYMMETRIC SELF-EFFICACY SCALE

(CLINIC SUBJECTS)
## Appendix I

Final Instrument Including Asymmetric Self-Efficacy Scale (Clinic Subjects)

### SELF-EFFICACY AND SELF-MANAGEMENT STUDY QUESTIONNAIRE

**Section I. Demographic questions**

1. How would you describe yourself?
   - A. African American/Black
   - B. White/Caucasian
   - C. Latino
   - D. Asian
   - E. Native American

2. What is your sex?
   - A. Female
   - B. Male

3. What is your age at your last birthday?

4. What is your marital status?
   - A. Single
   - B. Divorced
   - C. Married

5. What type of health insurance do you have?
   - A. Private
   - B. Public
   - C. Other
   - D. None

6. What is your income?
   - A. Less than $20,000
   - B. $20,000–$40,000
   - C. $40,000–$60,000
   - D. Greater than $60,000

7. What level of education have you completed?
   - A. Some high school
   - B. High school graduate or GED
   - C. Some college
   - D. College graduate

**Section II. Questions about Your Diabetes**

8. How long have you been diagnosed with type 2 diabetes?
   - A. Less than 1 year
   - B. Greater than 1 year

9. How long have you been receiving treatment (medication) for your diabetes?
   - A. Less than 1 year
   - B. Greater than 1 year

10. Are you currently taking your insulin and/or diabetes medication as prescribed?
    - A. No, I have never had them
    - B. No, but I took them before
    - C. Yes, some of the time
    - D. Yes, daily

11. Do you also have diagnosed chronic illnesses (ex. heart disease, cancer) other than diabetes?
    - A. Yes
    - B. No

**Section III. Doctor Office Visit Related Questions**

12. How often in the last 12 months have you visited a doctor for your diabetes?
    - A. More than once a month
    - B. Monthly
    - C. 3–4 times per year
    - D. 1–2 times per year
    - E. Not visited doctor(s) in the last 12 months

13. What education did you receive from your doctor or other healthcare professional about your diabetes (circle all that apply)?
    - A. Exercise
    - B. Diet
    - C. Post exam
    - D. Taking medications
    - E. Education (ex. One-on-one or group)

---

Terri Robinson, Doctoral Candidate, Kent State University
An analysis of the influence of the type of diabetes education and self-management programming on self-efficacy among adult African Americans with type 2 diabetes

14. How often did you receive education (ex. One-on-one or group) from your doctor or other healthcare professional about diabetes during your doctor visit in the past 12 months?
   A. Never
   B. Almost never
   C. Sometimes
   D. Usually
   E. Almost always
   F. Always

15. Have your doctor ever recommended a community program or support group that aims to help people with diabetes?
   A. Yes
   B. No

Section IV. Self-efficacy Questions. Please check answer that describes how convinced you are in managing your diabetes.

<table>
<thead>
<tr>
<th></th>
<th>Certainly</th>
<th>Most Probably</th>
<th>Maybe, Maybe Not</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>I am able to adjust my diet when I am under stress or tension.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>17</td>
<td>I am able to visit the doctor once a year to monitor my diabetes</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>18</td>
<td>I am able to check my blood sugar if necessary.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>19</td>
<td>I am able to correct my blood sugar when the blood sugar value is too high.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>20</td>
<td>I am able to correct my blood sugar when the blood sugar value is too low.</td>
<td>O</td>
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<td>O</td>
</tr>
<tr>
<td>21</td>
<td>I am able to select the right foods.</td>
<td>O</td>
<td>O</td>
<td>O</td>
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<td>I am able to select different foods but stay within my diet recommended for my diabetes.</td>
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<td>I am able to examine my feet for skin problems.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>25</td>
<td>I am able to perform sufficient physical activities for example walking or biking.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>26</td>
<td>I am able adjust my diet when I am away from home.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>27</td>
<td>I am able to follow my diet most of the time.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>28</td>
<td>I am able to perform extra physical activities, when the doctor advises me to do so.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>29</td>
<td>When performing extra physical activities, I am able to adjust my diet.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>30</td>
<td>I am able to follow my diet when I am away from home.</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>31</td>
<td>I am able to follow my diet when I am on vacation.</td>
<td>O</td>
<td>O</td>
<td>O</td>
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<tr>
<td>32</td>
<td>I am able to follow my diet when I am at a reception or</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

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An analysis of the influence of the type of diabetes education and self-management programming on self-efficacy among adult African Americans with type 2 diabetes

33. I am able to adjust my diet when I am ill.
   - 0 0 0 0 0
   If you take medicine for your diabetes please answer the next two questions. If you do not take medicine for your diabetes please skip to question 36

34. I am able to take my medicine as prescribed.
   - 0 0 0 0

35. I am able to adjust my medicine when I’m ill.
   - 0 0 0 0

Section V. About Participation in Diabetes Community/Support Programs

36. A faith-based program is sponsored by an associated church or religious organization. Have you ever participated in such a program for your diabetes in the past 12 months?
   A. Yes
   B. No (please skip to question 40)

37. If yes, how long have you participated in the faith-based program in total?
   A. Less than 1 year
   B. Greater than 1 year

38. How often did you attend the faith-based program in the last 12 months?
   A. Never
   B. Less than once a month
   C. Once a month
   D. More than once a month

39. What education did you receive from the faith-based program (circle all that apply)?
   A. Exercise
   B. Diet
   C. Foot exam
   D. Taking medications
   E. Education (ex. One-on-one or group)
   F. Blood pressure
   G. Hemoglobin A1c
   H. Cholesterol
   I. Blood glucose check

40. Have you ever participated in any community program or support groups intended to help each other to better deal with diabetes in the past 12 months?
   A. Yes
   B. No (You are done. Thank you for completing this survey!)

41. If yes, how often have you participated in other program(s) (ex. community center, school, work) to help with your diabetes?
   A. Never
   B. Less than once a month
   C. Once a month

Terri Robinson, Doctoral Candidate, Kent State University
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D. more than once a month

42. If yes, what activities have you participated in the other program(s)? (Circle all that apply)

A. Exercise
B. Diet
C. Foot exam
D. Taking medications
E. Education (ex. One-on-one or group)
F. Blood pressure
G. Hemoglobin A1c
H. Cholesterol
I. Blood glucose check

Thank you!

Terri Robinson, Doctoral Candidate, Kent State University
APPENDIX J

FINAL INSTRUMENT INCLUDING ASYMMETRIC SELF-EFFICACY SCALE

(FBO SUBJECTS)
Appendix J

Final Instrument Including Asymmetric Self-Efficacy Scale (FBO Subjects)

An analysis of the influence of the type of diabetes education and self management programming on self-efficacy among adult African Americans with type 2 diabetes

SELF-EFFICACY AND SELF-MANAGEMENT STUDY QUESTIONNAIRE

Section I. Demographic Questions

1. How would you describe yourself?
   A. African American/Black
   B. White/Caucasian
   C. Latino
   D. Asian
   E. Native American

2. What is your sex?
   A. Female
   B. Male

3. What is your age at your last birthday?

4. What is your marital status?
   A. Single
   B. Divorced
   C. Married

5. What type of health insurance do you have?
   A. Private
   B. Public
   C. Other
   D. None

6. What is your income?
   A. Less than $20,000
   B. $20,000-$40,000
   C. $40,000-$60,000
   D. Greater than $60,000

7. What level of education have you completed?
   A. Some high school
   B. High school graduate or GED
   C. Some college
   D. College graduate

Section II. Questions about Your Diabetes

8. How long have you been diagnosed with type 2 diabetes?
   A. Less than 1 year
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9. How long have you been receiving treatment (medication) for your diabetes?
   A. Less than 1 year
   B. Greater than 1 year

10. Are you currently taking your insulin and/or diabetes medication?
    A. No, I have never had them
    B. No, but it took them before
    C. Yes, some of the time
    D. Yes, daily

11. Do you also have diagnosed chronic illnesses (ex. heart disease, cancer) other than diabetes?
    A. Yes
    B. No

Section III. Doctor Office Visit Related Questions

12. How often in the last 12 months have you visited a doctor for your diabetes?
    A. More than once a month
    B. Monthly
    C. 3-4 times per year
    D. 1-2 times per year
    E. Never visited doctor(s) in the last 12 months

13. What education did you receive from your doctor or other healthcare professional about your diabetes (circle all that apply)?
    A. Exercise
    B. Diet
    C. Foot exam
    D. Taking medications
    E. Education (ex. One-on-one or group)
    F. Blood pressure

Terri Robinson, Doctoral Candidate, Kent State University
An analysis of the influence of the type of diabetes education and self-management programming on self-efficacy among adult African Americans with type 2 diabetes

14. How often did you receive education (ex. One-on-one or group) from your doctor or other healthcare professional about diabetes during your doctor visit in the past 12 months?
   A. Never
   B. Almost never
   C. Sometimes
   D. Usually
   E. Almost always
   F. Always

15. Has your doctor ever recommended a community program or support group that aims to help people with diabetes?
   A. Yes
   B. No

Section IV. Self-efficacy Questions. Please check answer that describes how convinced you are in taking care of your diabetes.

<table>
<thead>
<tr>
<th>Question</th>
<th>Certainly</th>
<th>Most Probable</th>
<th>Maybe, Maybe Not</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Can I adjust my diet when I am under stress or tension?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>17. Can I visit the doctor once a year to monitor my diabetes?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>18. Can I check my blood sugar if necessary?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>19. Can I correct my blood sugar when the blood sugar value is too high?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>20. Can I correct my blood sugar when the blood sugar value is too low?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>21. Can I select the right foods?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>22. Can I select different foods but stay within my diet recommended for my diabetes?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>23. Can I keep my weight under control?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>24. Can I examine my feet for skin problems?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>25. Can I perform sufficient physical activities for example walking or biking?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>26. Can I adjust my diet when I am ill?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>27. Can I follow my diet most of the time?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>28. Can I perform extra physical activities, when the doctor advises me to do so?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>29. When performing extra physical activities, I am able to adjust my diet?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>30. Can I follow my diet when I am away from home?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>31. Can I adjust my diet when I am away from home?</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Terri Robinson, Doctoral Candidate, Kent State University
An analysis of the influence of the type of diabetes education and self-management programming on self-efficacy among adult African Americans with type 2 diabetes

<table>
<thead>
<tr>
<th>Question</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am able to follow my diet when I am on vacation.</td>
<td>O O O O</td>
</tr>
<tr>
<td>I am able to follow my diet when I am at a reception or party.</td>
<td>O O O O</td>
</tr>
<tr>
<td>If you do not take medicine for your diabetes, skip the next two questions. Please answer if you take medicine for your diabetes.</td>
<td>O O O O</td>
</tr>
<tr>
<td>I am able to take my medication as prescribed</td>
<td>O O O O</td>
</tr>
<tr>
<td>I am able to adjust my medication when I am ill</td>
<td>O O O O</td>
</tr>
</tbody>
</table>

Section V. Participation in Diabetes Community/Support Programs

36. Today, are you here to participate in the program for your diabetes?  
   A. Yes  
   B. No (Please skip to Question 41)

37. Do you know this diabetes program is also known as a faith-based or church-based education program?  
   A. Yes  
   B. No

38. How long have you participated in this program in total?  
   A. Less than 1 year  
   B. Greater than 1 year

39. How often did you attend this program in the last 12 months?  
   A. Never  
   B. Less than once a month  
   C. Once a month  
   D. More than once a month

40. What education did you receive at this program (circle all that apply)?  
   A. Exercise  
   B. Diet  
   C. Foot exam  
   D. Taking medications  
   E. Education (ex. One-on-one or group)  
   F. Blood pressure  
   G. Hemoglobin A1C  
   H. Cholesterol  
   I. Blood glucose check

41. Are you participating in other similar programs somewhere else (ex. community center, church, work, school)?  
   A. Yes (please continue on to the last two questions)  
   B. No (you are done. Thank you for completing this survey!)

42. If yes, how often have you participated in other program(s)?  
   A. Never  
   B. Less than once a month  
   C. Once a month

Terri Robinson, Doctoral Candidate, Kent State University
An analysis of the influence of the type of diabetes education and self management programming on self-efficacy among adult African Americans with type 2 diabetes

D. more than once a month

43. If yes, what activities have you participated in the other program(s) (Circle all that apply)?
A. Exercise
B. Diet
C. Foot exam
D. Taking medications
E. Education (ex. One-on-one or group)
F. Blood pressure
G. Hemoglobin A1c
H. Cholesterol
I. Blood glucose check

Thank you!

Terri Robinson, Doctoral Candidate, Kent State University
APPENDIX K

ORIGINAL SELF-EFFICACY INSTRUMENT SYMMETRIC SCALE
# Appendix K

## Original Self-Efficacy Instrument Symmetric Scale

**Diabetes Management Self-Efficacy Scale (DMSES) for Patients with Type 2 Diabetes.**

*Directions*
*Please answer each question by checking the answer that describes how convinced you are in managing your diabetes.*

<table>
<thead>
<tr>
<th></th>
<th>Definitely Not</th>
<th>Probably Not</th>
<th>Maybe Yes</th>
<th>Probably Yes</th>
<th>Definitely Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I think I'm able to check my blood sugar if necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I think I'm able to correct my blood sugar when the blood sugar value is too high.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I think I'm able to correct my blood sugar when the blood sugar value is too low.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I think I'm able to select the right foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I think I'm able to select different foods but stay within my diabetic diet.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I think I'm able to keep my weight under control.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I think I'm able to examine my feet for skin problems.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I think I'm able to get sufficient physical activities, for example taking a walk or biking.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I think I'm able to adjust my diet when I'm ill.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I think I'm able to follow my diet most of the time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I think I'm able to take extra physical activities, when the doctor advises me to do so.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. When taking extra physical activities, I think I'm able to adjust my diet.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I think I'm able to follow my diet when I am away from home.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I think I'm able to adjust my diet when I am away from home.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>Statement</td>
<td>Yes</td>
<td>Definitely</td>
<td>Probably</td>
<td>Maybe</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------------------------</td>
<td>-----</td>
<td>------------</td>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td>15.</td>
<td>I think I'm able to follow my diet when I am on vacation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>I think I'm able to follow my diet when I am at a reception/party.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>I think I'm able to adjust my diet when I am under stress or tension.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>I think I'm able to visit the doctor once a year to monitor my diabetes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Would you please answer the next two questions if you take medication (pill) for your diabetes. If you do not take medication to control your diabetes you can skip these two questions and continue with the general questions.

<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Yes</th>
<th>Definitely</th>
<th>Probably</th>
<th>Maybe</th>
<th>No</th>
<th>Maybe</th>
<th>Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.</td>
<td>I think I'm able to take my medicine as prescribed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I think I'm able to adjust my medication when I'm ill.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The 'Diabetes Management Self-Efficacy Scale for Type 2 Diabetes' is developed by:
Dr. Jasp van der Blij (e-mail: Jasp.vanderBlij@hollandsLat)
Prof. dr. Linnie Shortridge-Baggett (e-mail: lShortridgeBaggett@necen.edu)

References:

APPENDIX L

ORIGINAL SELF-EFFICACY INSTRUMENT ASYMMETRIC SCALE
Appendix L

Original Self-Efficacy Instrument Asymmetric Scale

DIABETES MANAGEMENT SELF-EFFICACY SCALE (OMISES) FOR PATIENTS WITH TYPE 2 DIABETES.

Directions
Please answer each question by checking the answer that describes how convinced you are in managing your diabetes.

<table>
<thead>
<tr>
<th>Question</th>
<th>unlikely</th>
<th>maybe, not sure</th>
<th>probably</th>
<th>most likely</th>
<th>certainly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I think I'm able to check my blood sugar if necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td>3. I think I'm able to correct my blood sugar when the blood sugar value is too low.</td>
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<td></td>
<td></td>
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<td>5. I think I'm able to select different foods but stay within my diabetic diet.</td>
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<tr>
<td></td>
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<td>---</td>
<td>---</td>
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</tr>
<tr>
<td>16.</td>
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</tr>
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</table>

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<p>| | | | | | |</p>
<table>
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<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19.</td>
<td>I think I'm able to take my medicine as prescribed.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I think I'm able to adjust my medication when I'm ill.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The 'Diabetes Management Self-Efficacy Scale for Type 2 Diabetes' is developed by:
Dr. Jaap van der Bijl (e-mail: Jaap.vanderBijl@imholland.nl)
Prof. dr. Lillie Shortridge-Baggett (e-mail: lshortridgebaggett@pace.edu)

References:

APPENDIX M

SELF-EFFICACY SCALE PERMISSION
Appendix M

Self-Efficacy Scale Permission

Kent State University
Kent, OH

Fri, Sep 27, 2013 at 12:03 PM

Shortridge-Baggett, Prof. Lillie M. <shortridgebaggett@poce.edu>
To: TERRI ROBINSON <trobins@kent.edu>
Cc: "Jaap J van der Bijk" <jaap.vanderbij@gmail.com>

Tent,

Thanks for your message. I am pleased to hear about your research and interest in the Diabetes Management Self-Efficacy Scale.

I am copying my co-investigator in The Netherlands for his information. I am traveling now, but I will respond in more detail soon.

Lillie

Sent from my T-Mobile 4G LTE Device

[Quoted text hidden]

Fri, Sep 27, 2013 at 11:38 AM

Bijl, Jaap van der <jaap.vanderbij@gmail.com>
To: "Shortridge-Baggett, Prof. Lillie M." <shortridgebaggett@poce.edu>, TERRI ROBINSON <trobins@kent.edu>

Dear Tent,

Thanks for your message and to learn of your interest in using the tool that has been developed as part of our program of research on self-management in chronic illness. Prof. dr. Lillie Shortridge-Baggett and I do grant permission for using the scale. We would appreciate to receive a copy of the psychometric estimates you receive on the tool when you use it and your findings. We like tracking the psychometrics for the (translated) scale throughout the world.

I have attached two versions of the Diabetes Management Self-Efficacy Scale (DMSES): an 11-point scale with the general questions included and the DMSES 5-point scale. So, you can consider to use the 5-point or the 11-point scale. The Likert-type diabetes management self-efficacy scale for people with type 2 diabetes has been treated as a summated rating scale. The scale does not contain any reverse worded items. For every person in the study a total score can be determined by adding together the 20 individual item scores. If you use the 5-point scale the total score must be interpreted as follows: the higher the score, the lower the self-efficacy. When using the 11-point scale the interpretation is: the higher the score, the higher the self-efficacy. The total scores then can be correlated with the scores on other variables. The items can be analyzed on an individual level by computing means and standard deviations in order to see on what items or self-management categories the self-efficacy is high or low.

If you need more information, please let me know.
We wish you much success on your research project.

Sincerely,

Jaap van der Bijl
Dr. Jaap van der Bijl
Lecturer and Researcher

http://mail.zeall.com/mail/ln?inf=7&kne=1&k=7&vo=ver&ovom=ndow&the=1&n=00187ua768

100014
Dear Terri,

A lot of self-efficacy scale have been developed in the meantime with various response scales. One of the most used scales in that area is the General Self-Efficacy Scale (GSE) developed by Jerusalem & Schwarzer in 1981 in German and translated and validated now in 31 languages. They also use a 4-point answering scale: 1 = Not at all true, 2 = Hardly true, 3 = Moderately true, 4 = Exactly true. Another 4-point response format often used is: (1) very uncertain, (2) rather uncertain, (3) rather certain, and (4) very certain. For the Dutch DMSES we chose to use a 5-point Likert scale based on a similar argument: elderly people, often from low socioeconomic communities, having problems with complex response scales. So, I think you have a good argument to use the 4-point Likert scale with regard to the underserved minority population.

Best regards,

Jaap

Van: TERRI ROBINSON [mailto:terobins@kent.edu]
Verzonden: woensdag 26 februari 2014 15:09
Aan: Blij, Jaap van der
Onderwerp: Re: Kent State University Grad Student

[Quoted text hidden]
REFERENCES
REFERENCES


http://www.thecommunityguide.org/diabetes/supportingmaterials/RRcommunity.html


