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A Systematic Evaluation Of An Educational Bible Study Classes Focusing On Diabetes Prevention - Just Having C.H.U.R.C.H: Controlling How Unhealthy Regimens Can Hurt.

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A SYSTEMATIC EVALUATION OF AN EDUCATIONAL BIBLE STUDY CLASSES FOCUSING ON DIABETES PREVENTION - JUST HAVING C.H.U.R.C.H: CONTROLLING HOW UNHEALTHY REGIMENS CAN HURT.

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A DISSERTATION

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A SYSTEMATIC EVALUATION OF AN EDUCATIONAL BIBLE STUDY CLASS FOCUSING ON DIABETES PREVENTION- JUST HAVING C.H.U.R.C.H: CONTROLLING HOW UNHEALTHY REGIMENS CAN HURT

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HEALTH EDUCATIONA/HEALTH PROMOTION

ABSTRACT

Diabetes is a growing problem in public health and the African-American population. Preventive measures such as changes in diet, increasing physical activity, and weight control are behaviors that will lead to a healthier lifestyle and prevent the onset of diabetes. The purpose of this study was to determine if the National Diabetes Education Program *Power to Prevent* curriculum improved diabetes prevention perceptions and behaviors among participants receiving the curriculum. The study tested the effectiveness of *Power to Prevent* specifically designed for African-Americans, paired with scripture in a bible school format, for diabetes prevention in local Baptist churches in Birmingham, AL. The study measured participants' risk levels, perceptions, and risk management behaviors as they relate to diabetes prevention.

A 2x2 repeated measures ANOVA was performed to determine if a difference existed between the intervention and comparison participants at pretest and/or posttest. Risk levels (*Diabetes Risk Test* scores); perceptions (Health Belief Model constructs of perceived susceptibility, severity, benefits, and barriers); and risk management behaviors (exercise, health behaviors, and nutrition) were assessed.

Although majority of the findings were not significant among participants in the intervention and comparisons groups at pretest and posttest, there was a significant group-by-test interaction effect for perceived severity.

Keywords: *Power to Prevent*, diabetes, diabetes prevention, church-based intervention, Health Belief Model

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LIST OF ABBREVIATIONS

AA	African American
ADPH	Alabama Department of Public Health
ADA	American Diabetes Association
ADART	American Diabetes Association Risk Tool
BRFSS	Behavior Risk Factor Surveillance System
BMI	Body Mass Index
CDC	Centers for Disease Control
CHA	Community Health Advisor
CHC	Community Health Centers
DM	Diabetes Mellitus
DM1	Diabetes Mellitus Type 1
DM2	Diabetes Mellitus Type 2
DPP	Diabetes Prevention Program
DRT	Diabetes Risk Test
FPG	Fasting Plasma Glucose
FBS	Fit Body & Soul
DPS	Finnish Diabetes Prevention Study
HBM	Health Belief Model
IFG	Impaired Fasting Glucose

IRB	Institutional Review Board
NDEP	National Diabetes Education Program
NIH	National Institute of Health
USDHHS	U.S. Department of Health and Human Services

LIST OF KEY TERMS

Diabetes Mellitus (DM)	A metabolic disorder affecting the way cells in the body take in glucose.
Gestational Diabetes	Develops only during pregnancy in women who were not diagnosed prior to their pregnancy.
Health Belief Model (HBM)	A theoretical model comprised of six concepts that influences decisions on whether to take action to prevent, screen for, and control illness.
Insulin	A hormone that helps the body use glucose for energy.
Pre-Diabetes	A condition in which blood sugar levels are higher than normal but not high enough for an individual to be diagnosed with diabetes.
Perceived Barriers	Individual's issues or concerns affecting his/her ability to take action and prevent a disease or health issue; this is a key construct of the Health Belief Model.
Perceived Benefits	Individual's belief in the effectiveness of taking actions to reduce the risk of a disease or health issue; this is a key construct of the Health Belief Model.
Perceived Severity	Individual's belief about seriousness and consequence of getting a disease or health issue; this is a key construct of the Health Belief Model.
Perceived Susceptibility	Individual's belief about the chances of getting a disease or health issue; this is a key construct of the Health Belief Model.
Reliability	The extent to which an instrument produces a consistent result.

Self-efficacy	As defined by Bandura (1985) describes an individual's beliefs about his/her capabilities to perform a specific action or behavior and exercise influence over events that affect his/her life.
Type I Diabetes (DM1)	A condition where the body does not produce insulin.
Type II Diabetes (DM2)	A condition where either the body does not produce enough insulin, or the cells do not use the insulin properly.

CHAPTER ONE

INTRODUCTION

Diabetes Mellitus (DM) is "a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both" (American Diabetes Association [ADA], 2009, p. 62). When glucose levels fluctuate and the body cannot utilize the glucose properly, individuals are at an increased risk for developing diabetes. Diabetes Mellitus remains the seventh leading cause of disease-related deaths, as reported in 2014 by the Centers for Disease Control and Prevention (CDC). Furthermore, it can cause serious health complications such as kidney failure, heart disease, and blindness (CDC, 2014).

According to the CDC, there are several risk factors associated with diabetes mellitus (2011b). Those risk factors are broken down into two categories: non-modifiable and modifiable. Non-modifiable risk factors are not controlled by an individual and include the following: family history, ethnic background, age, and gestational diabetes. On the other hand, modifiable risk factors, those controlled by an individual are: physical inactivity, excess weight, high blood pressure and abnormal cholesterol levels.

The CDC also identifies several symptoms individuals may experience if they suspect they may have diabetes: frequent urination, excessive thirst, unexplained weight lost, extreme hunger, fatigue, tingling or numbness in hands or feet, dry skin, and blurry eyesight (CDC, 2014). These symptoms are not always noticed, or may be ignored, and an individual may still develop diabetes or another serious health issue. The best way for an individual to know his/her risk is with a blood glucose test called hemoglobin A1C.

Populations at greater risk for diabetes are African-Americans, American Indians, Alaska Natives, Asian Americans, Pacific Islanders, and Hispanic/Latinos (ADA, 2012a; and National Diabetes Education Program [NDEP], n.d.). National survey data from the CDC in 2009, found an 18% higher rate for diabetes among Asian Americans, 66% higher among Hispanics/Latinos, and 77% higher among non-Hispanic blacks when compared to non-Hispanic white adults (CDC, 2011b). Although researchers at the CDC are unable to specifically pinpoint why these minority groups are at a higher risk for developing diabetes, lack of access to health care, poverty, cultural attitudes, and behavior may strengthen barriers for prevention and management of diabetes (CDC, 2013).

Statement of Problem

In 2012, the CDC reported that southern states have the highest rate of diabetes among minority and elderly populations. Mississippi and West Virginia are ranked 1st and 2nd, respectively. In the most recent data collected in 2010, Alabamians aged 18 years and older were diagnosed with diabetes at a rate of 13.2% compared to 8.7% diagnosed in the United States (Kaiser, 2010). Although mortality rates have fluctuated over the past ten years, diabetes remains the 6th leading cause of death in Alabama (Alabama Department of Public Health [ADPH], 2010). According to 2008 data from the ADPH, Alabama's diabetes mortality rate decreased from 31.1% in 2006 to 27.8% in 2007 and increased to 29.6% in 2008. In 2010, data from the CDC indicates that Alabama is ranked 3rd in the United States and surrounding territories for percentage of adults with diabetes (ADPH, 2010). According to the American Diabetes Association, diabetes is a serious health problem facing the African-American community, when

compared to the general population (2012b). This serious health problem has brought attention to the need for diabetes prevention education.

In addition to the health consequences, the economic burden for individuals living with diabetes is very costly. As of 2012, the total direct and indirect estimated diabetes cost in the United States is $245 billion (CDC, 2014). The 2014 CDC's National Diabetes Fact Sheet reports that the direct medical cost is $176 billion compared to $69 billion for indirect cost. The average direct medical costs associated with diagnosed diabetes were 2.3 times higher than for individuals not diagnosed. Diabetes indirect costs included disability, work loss, and premature mortality (CDC, 2014).

A major goal outlined in Healthy People 2020 is to reduce the disease and economic burden of DM and improve the quality of life for all persons who have, or are at risk for, DM (United States Department of Health and Human Services [USDHHS], 2010). Healthy People 2020 has 16 objectives related to diabetes ranging from prevention and treatment efforts, to control and education. The objective specifically related to diabetes prevention is D-16 which is to increase prevention behaviors in persons at high risk for diabetes with prediabetes (USDHHS, 2010).

Conceptual Framework

This intervention study is grounded in constructs from the Health Belief Model. The Health Belief Model (HBM), developed and introduced by Hochbaum & Rosenstock in the 1950s, was developed to explain the unsuccessful rates of preventive medical screening programs (tuberculosis) by the U.S. Public Health Service (Rosenstock, 1974). Since its inception, the HBM has been adapted to understand, explore, and explain various preventive health behaviors. The model is based on the premise that behavior

depends on expected outcome and how much an individual values that outcome. The constructs of the HBM are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Glanz, Rimer, & Lewis, 2002; Rosenstock, Strecher, & Becker, 1988). However, only four constructs will be addressed during this study: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers.

Purpose of the Study

The purpose of this study was to determine if the National Diabetes Education Program *Power to Prevent* curriculum improved diabetes prevention perceptions and behaviors among participants receiving the curriculum. The study tested the effectiveness of *Power to Prevent,* specifically designed for African-Americans, paired with scripture in a bible school format, for diabetes prevention in local Baptist churches in Birmingham, AL. The study assessed participants' risk levels, perceptions, and risk management behaviors as they relate to diabetes prevention.

The study's purpose is directly related to Healthy People 2020 diabetes objectives to prevent the onset of diabetes and improve the quality of life for people who are at risk for developing diabetes or who are currently living with diabetes. More specifically, Healthy People 2020's objective D-16 focuses on increasing prevention behaviors in people who are at high risk for diabetes (USDHHS, 2010). Sub-objectives D-16.1, D-16.2, and D-16.3 refer to preventive behaviors associated with physical activity, weight loss, and diet. Overviews of the Healthy People 2020 diabetes objectives are located in the Appendix A.

Significance of the Study

Diabetes prevention education is vital in reducing the prevalence of diabetes. Prevention education aids in early detection that can lessen the likelihood of complications associated with diabetes (CDC, 2012). Although there are studies examining the design and implementation of preventive health behavior programs, evaluations of diabetes prevention program specifically designed for the African-American population, *Power to Prevent*, has not been reported. This will be the first reported study that will utilize the *Power to Prevent* curriculum in a church setting in its entirety with reportable results. The results of this study will assist health educators in understanding and planning interventions to prevent the onset of diabetes in African Americans.

Research Questions

1. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease the diabetes risk levels of participants, as evidenced by the *Diabetes Risk Test* scores, when compared to levels of participants in a comparison bible study group?
2. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived susceptibility scores of participants when compared to scores from participants in a comparison bible study group?
3. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived severity scores of participants when compared to scores from participants in a comparison bible study group?

4. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived benefits scores of participants when compared to scores from participants in a comparison bible study group?
5. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease perceived barriers scores of participants when compared to scores from participants in a comparison bible study group?
6. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum change risk management behavior measures (exercise, health behaviors, and nutrition) of participants when compared to measures from participants in a comparison bible study group?

Study Assumptions

1. The theoretical framework (HBM) is an accurate reflection of the phenomena being studied.
2. The pretest and posttest HBM items, adapted from Champion's (1984) Breast Cancer Scale questionnaire, are valid and reliable as measures of the constructs of perceived susceptibility, severity, benefits, and barriers for this study.
3. The methods are appropriate for the research questions being addressed and the purpose of the study.
4. Participants accurately report their perceptions of their diabetes risk.

Limitations of the Study

One possible limitation of this study involves individuals' participation in a 10-week bible study class. Attending any faith-based service is voluntary, and participation in the program may not yield the same participants each week. This also limits exposure to the intervention for those who did not attend regularly. Another limitation is the reliance on data collection through self-report. Although self-reporting methods for data collection are known to be cost-effective, convenient, consistent with questions asked, and a credible source of data collection (Cottrell & McKenzie, 2005), possible inaccuracies may occur due recall to bias and the credibility of responses (Paulhus & Vazire, 2007). A final possible limitation is convenience sampling, which could limit the generalizability of the study.

Summary

This chapter presented an introduction to diabetes risk factors, symptoms, and prevalence; a statement of problem: the conceptual framework used; and the significance of the study. Literature reviews were retrieved from library databases including: PubMed, MEDLINE, and OVID. The purpose and research questions were also included, as well as study assumptions and limitations. As stated, the study examined the effectiveness of the *Power to Prevent* curriculum, delivered in a bible study setting, to improve diabetes prevention perceptions and behaviors. The results of this study will assist health educators in understanding and planning interventions to reduce the onset of diabetes in African Americans.

This study utilized the five chapter thesis/dissertation model. Chapter One, as summarized above, provides the readers with an introduction to the topic of diabetes, a

statement of the problem, the conceptual framework used, purpose of the study, research questions, significance of the problem, and study assumption and limitations. Chapter Two provides a review of literature, including studies that involved diabetes prevention, and the theoretical framework guiding the study. Chapter Three provides the study methodology. Chapter Four describes the study findings. Chapter Five provides the summary, discussion, and future research recommendations.

CHAPTER TWO

REVIEW OF LITERATURE

Chapter Two provides an overview of milestone diabetes studies within the United States and African-American populations. The history of the Health Belief Model is also presented. This chapter includes sections on (a) the types of diabetes, (b) risk factors for diabetes, (c) historical and current studies on diabetes prevention, (d) church-based diabetes preventions studies, and (e) previous use of the Health Belief Model.

Types of Diabetes

Many forms of diabetes exist and can be classified in four distinct categories: pre-diabetes, gestational diabetes, diabetes mellitus 1 (DM1), and diabetes mellitus 2 (DM2) as described by the American Diabetes Association (ADA, 2012a). The least common of these are pre-diabetes, gestational diabetes, and DM1; DM2 is the most common. According to the CDC's National Diabetes Statistics Report (CDC, 2014, p. 9-10), pre-diabetes is "a state in which an individual's blood sugar levels are slightly higher than normal but not high enough to be diagnosed with diabetes". Pre-diabetes is known as a precursor to diabetes; that is, most people with pre-diabetes will eventually develop diabetes unless they make changes in their eating habits and their physical activity levels (ADA, 2012a). Gestational diabetes is another type of diabetes that "only develops during pregnancy in women who were not diagnosed prior to their pregnancy and are at an increased risk to develop DM2 later in life" (NDEP, n.d.)

The third type of diabetes, DM1, most often occurs in youth and adults younger than 30 years and is managed by insulin administration (ADA, 2012a; and NDEP, n.d.). In DM1, the body does not produce enough insulin. On the other hand in DM2, either the

body does not produce enough insulin, or the cells do not use the insulin properly (ADA, 2012a; and NDEP, n.d.).

The forth type of diabetes, DM2, is the most common form of diabetes, accounting for 90–95% of people diagnosed and typically occurs in people older than 40 years (ADA, 2012a). The National Diabetes Educational Program states that DM2 occurs most often in people who are inactive and carry excess weight. In fact, the NDEP reports that 9 out of 10 people who are newly diagnosed with DM2 are overweight and physically inactive. Of the four types, DM2 is the most common.

The incidence of DM2 has more than doubled over the past 30 years (ADA, 2012a). In 2011, the American Diabetes Association reported that more than 1.9 million new cases have been reported in people aged 20 years and older compared to 63,000 cases fifteen years ago (ADA, 2012a). However, from 2008 through 2010, the number of new cases of diagnosed diabetes has shown little change (CDC, 2013). Data from the 2011 National Diabetes Fact Sheet shows that 25.8 million people have diabetes. Of this 25.8 million living with diabetes, 18.8 million have been diagnosed and 7 million are undiagnosed.

Diabetes Belt

In 2011, the CDC identified 644 counties in 15 states as the Diabetes Belt, located mostly in southern states (CDC, 2011a). These counties were identified based on the large percentage of individuals who live in these areas and are at a high risk for DM2. These identified counties were compared against other areas in the United States. Counties were also identified as part of the Diabetes Belt if at least 11% of residents were diagnosed with diabetes and located near another county that had a high rate of diabetes.

The entire state of Mississippi and portions of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, and West Virginia are part of the Diabetes Belt (CDC, 2011a). Data collected by the Behavior Risk Factor Surveillance System (BRFSS) from 2007 to 2008 serves as a centralized unit to obtain state-based health data through telephone surveys in the United States. As a result of this recently identified Diabetes Belt, the CDC suggests that individuals who have not been diagnosed with diabetes become physically active and lose weight if they are overweight. The CDC further suggests that African-Americans, especially those living at a low socioeconomic level, are more at risk for diabetes (2011a).

Health Disparities and Diabetes

Minority populations such as Asian Americans, Hispanics/Latinos, and African Americans are more frequently affected by Diabetes Mellitus Type 2 (DM2). According to Healthy People 2020, minority groups constitute 25% of all adult patients with diabetes in the United States and represent the majority of children and adolescents with DM2 (USDHHS, 2013). Some studies have suggested that poor dietary habits, physical inactivity, and obesity are three major lifestyle factors contributing to the high rates of diabetes among Americans, especially African Americans (Paschal, Lewis, Martin, Dennis-Shipp, & Simpson, 2004; Saaristo et al, 2010; The Diabetes Prevention Program [DPP] 2009). Paschal and colleagues reported that African-Americans have a higher prevalence of being obese compared to Caucasians, and obesity is usually a result of poor nutrition and inactivity. The authors also stated that up to 75% of African-American women rarely exercise and up to 66% percent of African-American men do not exercise.

Furthermore, the majority of African-Americans do not meet the minimum intake recommendations for daily servings of fruits and vegetables (Paschal et al., 2004).

Assessing Diabetes Risk Levels

The most widely used self-administered screening test to determine an individual's risk for diabetes is the *Diabetes Risk Test* developed by the American Diabetes Association (ADA, 2012a). The *Diabetes Risk Test* is composed of seven items to identify an individual's risk of developing type 2 diabetes. The items ask questions involving age group, gender, weight status, personal history of gestational diabetes, family history of diabetes, blood pressure status, and physical activity level. Each item receives a score, and item scores are summed to get a total score. Risk level is based on the total score, with a score of 5 or more indicating increased risk. Individuals whose score indicates increased risk are encouraged to talk to their doctor for additional tests and make the necessary behavioral lifestyle modification to prevent diabetes.

As a nationwide effort to spotlight the *Diabetes Risk Test*, the fourth Tuesday in March has been set aside by the American Diabetes Association as Alert Day (ADA, 2012a). This day is designated to increase the public awareness of diabetes and encourage the public to take the *Diabetes Risk Test* through the various media outlets, brochures, and handouts. This day also encourages high risk individuals to have an open dialogue with their health care provider (ADA, 2012a). Although Alert Day is a one-day event, the *Diabetes Risk Test* is easily available year-round and easily accessible on the ADA website. The National Diabetes Education Program also spotlights many organizations that use the *Diabetes Risk Test* and other printed material for diabetes

awareness. For example, in March 2011, the Alabama Department of Public Health's (ADPH) Diabetes Program utilized the *Diabetes Risk Test* and other informational material during the ADA Alert day for departmental employees (NDEP, 2012). With over 3,000 employees reached during this event, many employees requested additional diabetes information for themselves and to share with others (NDEP, 2012). Although the ADA does not have a specific figure available for information requested monthly (they respond to thousands of inquiries per month), a large percentage of requests are on diabetes prevention tips.

Although the *Diabetes Risk Test* is widely used in addition to other informational materials, there was no information found on the reliability and validity of this specific test. The local and national offices for the American Diabetes Association confirmed that there were no reported or documented reliability and validity data for the assessment. According to the ADA, the *Diabetes Risk Test* was developed as a precursor to talking to a health professional in determining if an individual is at risk for developing diabetes based on the known risk factors (ADA, 2012a).

One study used a similar self-report test titled the *American Diabetes Association Risk Tool* (ADART). This was the first study found that validated a tool used for risk assessment of pre-diabetes and diabetes (Li, 2011). The eight items on the ADART were similar to those on the *Diabetes Risk Test*. The items included age, body mass index (BMI), family history of diabetes, race, physical activity, impaired fasting glucose/fasting plasma glucose (IFG/FPG), blood pressure, and cholesterol number. The 3-year study, conducted in Taiwan on 1,021 residents with normal blood glucose levels, assessed the validity of the *American Diabetes Association Risk Tool* (Li, 2011).

In addition to the ADART, study variables included blood pressure measurements, a blood draw, and basic health and lifestyle information on all the participants at baseline. The aim of this study was to evaluate the performance of the ADART in identifying cases of type 2 diabetes during a 3-year period. Although this ADART is not the same as the *Diabetes Risk Test*, it is very similar in item construction.

Of the eight self-reported items, history of cardiovascular disease was associated with an increased incidence of abnormal FPG in men. The researcher also found that women who had a high BMI, developed gestational diabetes during pregnancy, watched TV for 25 hours or more, and had less than 9 years of education had an increased risk of having abnormal FPG levels, which can lead to diabetes. The authors concluded that the *American Diabetes Association Risk Tool* performed well in the study sample and was a good screening tool for predicting pre-diabetes and diabetes in females.

Diabetes Prevention Programs

The Diabetes Prevention Program (DPP) serves as the hallmark study for diabetes prevention. The Diabetes Prevention Program was a very successful clinical research study aimed at determining if dietary changes, increased physical activity, or medication (metformin) could prevent or delay the onset of type 2 diabetes in study participants (DPP, 2002). The researcher found that moderate weight loss through dietary changes and increased physical activity reduced participants' chances of developing diabetes. A total of 3,234 people participated in the DPP study and were all overweight and had pre-diabetes. The study consisted of 27 clinical centers in the United States randomly divided into groups: a lifestyle group, which received intensive training on diet, physical activity, and behavior modification; an intervention group, which received 850mg of

metformin to be taken two times a day plus information on diet and exercise; a control group, which received a placebo pill instead of metformin plus information on diet and exercise; and an additional group, which received Troglitazone but was soon discontinued due to serious health effects from the drug (DPP, 2002).

The DPP had six key features: goal-based interventions, lifestyle coaches, frequent contact with participants, individualized program materials, physical activity sessions, and local and national support groups. Participants were encouraged to lose 7% of their body weight in the first six months and increase to 150 minutes of moderate physical activity per week. The lifestyle coaches delivered the core curriculum, conducted post sessions, collected data, and provided motivation to participants. The core curriculum consisted of 16 sessions on healthy tips related to eating and becoming physically active and how to maintain healthy lifestyle behaviors. Each session lasted for 30 minutes to one hour, with private weigh-ins, review of self-monitoring records, and question/answer opportunities. The researchers concluded that the intervention was successful, as the lifestyle intervention group achieved a 58% decrease in the incidence rate at posttest of diabetes across participants. The metformin group reduced its risk by 31% at posttest, and the placebo group saw new cases of individuals diagnosed with diabetes by 11% from pretest to posttest. In addition to these results, the researcher addressed the needs of the ethnically diverse populations that were disproportionally affected by diabetes (African Americans, Hispanic Americans, American Indians and Asian Americans). Several case managers were chosen from the same ethnic groups as the participants to tailor programs and allow flexibility for the different types of foods,

cooking methods, and needs of various ethnic populations. Findings from this study have been used as a foundation for future diabetes prevention programs.

The Finnish Diabetes Prevention Study (DPS) has also been used as a foundational study for diabetes prevention involving a lifestyle intervention. This study recruited and randomized overweight/obese 522 individuals aged 40-64 years into either a lifestyle intervention or control group (Saaristo, et al, 2010). The main goal of the five-year (2003-2008) study implemented in five Finland based hospitals was to determine the feasibility and effect of lifestyle modification through individualized counseling, weight reduction, improved eating behaviors (decrease fat and increase fiber), and increased physical activity. Participants in the intervention group received one-on-one consultation, printed health material, cooking classes, weekly weight charts, and individually tailored circuit training. Participants were encouraged to complete a food record and physical activity questionnaire at baseline and follow-up. The control participants only received general health information in a single one hour session. The researcher noted that "at follow-up the intervention group had a weight loss of at least 5%, a decrease in fat intake, and an a improved fiber density measure" (Saaristo, et al, 2010, p.2149). The researchers concluded that lifestyle interventions can prevent or postpone diabetes and should be implemented in primary health care settings. The researchers also suggested that in order for the intervention to be effective, it should be individualized, continual, and performed by skilled professionals.

These two major diabetes studies (DPP and DPS) suggest that diabetes prevention can occur in different settings. Former U.S. Surgeon General, Dr. David Satcher, recommended that faith-based organizations can serve a vital role in public health

programming and research (Satcher, 1999). He stated that "through partnerships with faith organizations and the use of health promotions and disease prevention sciences, we [federal public agencies] can form a mighty alliance to build strong, healthy, and productive communities" (page 3). During President George W. Bush's term in office in 2001, he proposed a faith-based and community initiative. This initiative, later called the President's Advisory Council for Faith-Based and Neighborhood Partnerships, was created to "expand opportunities for faith-based and other community organizations and to strengthen their capacity to better meet social needs in American's communities" (Bush, 2001, p. 2).

> The mission of this council was to bring together religious leaders, neighborhood organizations, and experts to: Identify best practices and successful modes of delivering social services; evaluate the need for improvements in the implementation and coordination of public policies relating to faith-based and other neighborhood organizations; and make recommendations to the President, through the Executive Director, for changes in policies, programs, and practices that affect the delivery of services by such organizations and the needs of low-income and other underserved persons in communities at home and around the world (Bush, 2001, p. 2).

To date, this initiative remains a bridge between the federal government and nonprofit organizations to help serve the needs of the American public. However at its inception, little information was known about how this collaboration would work. In 2009, President Obama amended several sections of Bush's executive order and changed the name to the White House Office of Faith-Based and Neighborhood Partnerships

Council. As a result of Bush's initial order, and Obama's amended order, the initiative has formed additional partnerships between government and nonprofit organizations to serve the needs of the people, and has been largely successful. To date, the council has an active blog site highlighting the numerous initiatives between faith-based and community organizations, ranging from My Brother's Keeper, a Philadelphia-based food program, to public safety awareness.

Researchers at the University of Chicago conducted a study to examine if health centers and congregational collaborations could exist and if they were effective, and to understand if any barriers were associated with a partnership with health care professionals (Gee, Smucker, Chin, & Curlin, 2005). Key informants from five community-based health centers (CHC) from Chicago, Dallas, Indianapolis, and Los Angeles were recruited through the Christian Community Health Fellowship. There were a total of 23 participants: 19 pastors, 1 priest, 1 church council president, and 1 community director. A one-on-one semi-structured interview format was conducted using open-ended "grand tour" describe-to-me questions to generate hypotheses and provide descriptive information on the need for partnerships. The researchers found that the collaboration with health centers and congregations results in sharing resources, personnel and a useful avenue for health promotions programs. In so much that the researchers further suggest that forming stable, ongoing "faith partnerships" remains a desirable goal (Gee, Smucker, Chin, & Curlin, 2005).

Collaboration with faith -based organizations to promote health awareness is a valuable ally for public health program development (Levin & Hein, 2012). One well known study that involves the faith-based community and designed based on data from

the Diabetes Prevention Program is the Fit Body and Soul program, originally called The Body and Soul program. Results of the original program, suggested that health promotion efforts, delivered by community and health related agencies can be effectively implemented under real world conditions and in the African-American (AA) community (Dodani, Kramer, Williams, Crawford, and Krisha, 2009). The Fit Body and Soul program was later developed as a church based intervention that utilized community based participatory research and the objective of the study was to integrate two evidence-based lifestyle interventions (DPP and Body and Soul) into a socio-culturally, ethnically preferred intervention. This integration involved three steps: (a) form a partnership with local Georgia churches to design, initiate and manage the program and focus group meetings with trained health advisors; (b) create a church Advisory Board consisting of participating churches, representatives of the medical community and the research team; and (c) conduct workshops to adopt the 12-Session Fit Body and Soul (FBS) intervention (Dodani et al., 2009). The major themes for the 12 sessions focused on healthy eating, increased physical activity, and nutrition.

The 12-session FBS utilized three different levels (Dodani et al., 2009). The first level was church level which was led by the pastor to endorse the intervention and motivate the congregation to get involved. The second level was group level which was led by expert community health advisors (CHAs) for 12 weeks. The third level was individual level which was led by CHAs who contacted participants on an as-needed basis to assess progress and coach participants to achieve lifestyle goals. For this pilot study, 87% of participants attended at least 10 sessions, and 48% lost at least 5% of weight at the conclusion of the 12-week program (Williams, et al., 2013; Dodani et al.,

2009). The authors concluded that future interventions in churches may benefit from taking a faith-based approach that embraces how faith informs health-related perceptions, beliefs, and behaviors. The authors further concluded that African-American churches make an ideal setting for health-related programs, because churches are the "center" of many communities, especially for ethnically diverse and minority groups. African-American churches are also a great foundational setting to further assess the effectiveness of a behavioral lifestyle program in reducing risk of diabetes in the African-American population (Dodani et al., 2009).

The Fit Body and Soul program was further implemented in a larger randomized control trial consisting of 20 African-American churches to test the efficacy and cost utility of the adapted diabetes program implemented by church health advisors compared to a health education program and determine if there were any changes in participants' weigh reduction and physical activities (Williams et al., 2013). The researchers found that having all sessions and evaluations at the participant church enhanced participation in the program and cost. The researchers suggested that utilizing investigators and trusted health leaders who are well known in the faith community helps with implementation and recruitment efforts. The researchers also recommended that although financial incentives are good, used of monetary incentives for general dissemination and sustainability is not likely in most programs.

Several health studies have utilized the church community to distribute information to congregants to improve their overall physical health. These health studies included topics such as mammography, hypertension, nutrition, cancer prevention, and physical activity (Barnes, 2005; Campbell et al., 2007; Caldwell, Chatters, Billingsley, &

Taylor, 1995). Newlin and colleagues (2012) suggest that religious leaders who endorse health programs are critical in influencing recruitment efforts and participant enrollment. Butler-Ajibade, Booth, and Burwell (2012) also suggest that partnering with Black churches is vital in the success of the creation and sustainably of health promotion programs, especially those targeting cardiovascular disease. Components of a successful church-based cardiovascular prevention program include the integration of prayer, scripture, and testimonies that are relevant and serve as a reinforcement to the mind, body and spiritual growth for participants (Barnes, 2005). Incorporating church representatives throughout the planning, implementation, and evaluation stages has also provided great success in reaching the targeted at-risk population (AHA, 2013a; Bopp et al., 2007

One program in particular, sponsored by the American Heart Association's (AHA) *Search Your Heart* program, is a faith-based curriculum focused on the health areas of heart disease and stroke, nutrition, and physical activity in African-American congregations (AHA, 2013a). The congregations utilized the *Search Your Heart* 9-session curriculum guide and toolkit provided by the American Heart Association. This program encouraged members to participate in *Go Red Sunday* during the month of February and *Power Sunday* events that provided congregants information on risk factors, signs, symptoms of heart disease and stroke, and increased awareness (AHA, 2013a). Similarly to the *Power to Prevent* curriculum (to be discussed later in this chapter), the *Power Sunday Toolkit* includes a wealth of information in a package/CD format designed to aid preachers in raising awareness about stroke in the community through speech, pulpit announcement, Litany, personal stories of congregation members, brochures, posters, and bulletin inserts. However, there is no documented statistical data on the

success of this program, although it has been used in numerous venues such as church and community centers.

The Magic City Stroke Prevention Project is another successful stroke prevention project targeted for African Americans (Allen, Telfair, & Bishop, 2008). This project focused on reducing stroke through education, identifying signs and symptoms of a stroke, and find ways to reduce the burden and prevent a stroke from occurring. It targeted African-Americans living in and around the Birmingham/Jefferson County area. The effectiveness of the project is best explained through the funding of mini grants to nonprofit community organizations, churches, and neighborhood associations. With the numerous educational outlets and mini grant partnerships formed with nonprofits, churches, and neighborhood associations, the Magic City Stroke Prevention Project proved very successful by funding 22 community-based stroke programs totaling $220,000 over a 3 year period and impacting 1744 households in Birmingham, AL (Allen, Telfair, & Bishop, 2008). However, this program was terminated early due to lack of federal funding.

Churches as a Venue for Health Promotion

Churches and other faith-based organizations have become popular universal settings to implement and conduct health promotion programs studies. Numerous programs have focused on Black churches as a venue to reduce disparities that exist between African-Americans and other racial/ethnic groups (Campbell, et al., 2007). Newlin, Dyess, Allard, Chase, and Melkus (2012) reviewed 19 studies that utilized faith-based health interventions targeted towards diabetes education. The researchers found that recruitment efforts, research approach, and retention strategies were similar among

the studies, and showed positive health outcomes in weight reduction, blood pressure, an increase in disease related knowledge, physical activity, and fruit and vegetable intake. Churches are a part of an existing social structure in African-American communities to capture the attention of its members, especially when raising health awareness. Church-based interventions assist in eliminating health disparities by eliminating barriers to access, creating collective participation from the community, and recognizing the link between faith and health in African Americans (Kotechi, 2002). In addition to churches being a convenient way to reach a target population, the church-based intervention can provide health-related educational and nutritional classes for members to decrease unhealthy habits and improve positive lifestyle choices, especially in the African-American Baptist churches.

The book of 1st Timothy 3:15 states that the purpose of the church is to be "the pillar and support of the truth" (New King James Version, 2005). In 2007, the U.S. Religious Landscape Survey conducted by The Pew Forum on Religion and Public Life (2008) found that 87% of African Americans are more likely to have a religious affiliation when compared to other racial and ethnic groups. The survey also found that 8 in 10 African-Americans (79%) consider religion important in their lives, compared to 56% of U.S. adults, with 70% of women and 55% of men citing religion as very important. The Pew Forum also reported that the racial divide is even larger - religion is considered very important by 87% of African Americans, compared to 61% of Caucasians.

The Baptist tradition, formed in the early 1600s, is one of the largest Christian denominations. This tradition believes that Jesus Christ died for the sins of the people,

the bible is foundation for its faith, and that believers should go through the sacrificial ritual of being baptized (Pastor Kevin Bryant, personal communication, January, 1, 2013). As an institution, the African-American church, especially the Baptist church, has a long and rich history as the center of spiritual, social, and political life for many African-Americans (Braithwaite & Taylor, 2001; Campbell et al., 2007). Historically, African-American the church's mission encompasses more than worship services and spiritual growth. Many African-American churches also contribute to the family, social, economic, and political welfare of their congregants, as well as the community at large, and they have been involved in health outreach programs such as free health clinics (Campbell et al., 2007; Markens, Fox, Taub, & Gilbert, 2002).

Diabetes prevention education is vital in reducing the prevalence of diabetes. Prevention education aids in early detection that can lessen the likelihood of complications associated with diabetes. Although studies were found examining the design and implementation of diabetes prevention bible school classes, there are health programs that use scriptures to encourage healthy living. One such program entitled *Project Joy* incorporated group prayer and health messages enriched with scriptures during weekly sessions for its faith based cardiovascular health program for African-American women (Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001). Churches have numerous functions within the community and offer open spaces and amenities for promoting health behaviors programs among African-Americans. African-American churches still include the health of their members and the community in their mission. In African-American communities, church (religion) is a major part of the community's

social fabric. It is the foundation of understanding family hierarchy, how to live right in the eyes of God, and how to follow leadership (Parmer & Rogers, 1997).

Many church-based health interventions and programs have shown promise for promoting the health of African-Americans (Holt, Lukwago, & Kreuter, 2003). The American Heart Association and American Cancer Society have found that working with churches to provide health information, education, and screenings offers a unique opportunity to work with high risk Americans at various socio-economic levels (Butler-Ajibade, Booth, & Burwell, 2012). African-American churches have served as the life-center of the community, providing services that nourish the mind, body, and soul (Pastor Gregory Clarke, personal communication, November 19, 2013). Many African-Americans families value the church as a foundation for building a family and a valuable part of one's lifestyle to grow as a family. Pastors provide congregational leadership not only for spiritual matters but also for social action and community outreach (Campbell et al., 2007; Thomas, Quinn, Billingsley, & Caldwell, 1993). The church is considered a respected and credible agency in the African-American community which may lead to improved partnerships with educational and public health agencies for church-based health education and interventions.

There are several health behavior interventions that have shown success in the church (Campbell, Hudson, Resnicow, Blakeney, Paxton, & Baskin, 2007). Several of these studies are highlighted in Appendix B. Erwin, Spatz, Stotts, and Hollenberg (1999) implemented a quasi-experimental design with a 6 month follow-up in 11 African-American churches in the Lower Mississippi Delta. The researcher found that utilizing breast cancer survivors to talk to church congregations about breast self-examinations

and the importance of mammography increased screenings. The Healthy Body/Healthy Spirit Trial provided 16 randomized African-American churches in Atlanta with monthly culturally targeted self-help material focused on nutrition and physical activity for a one year period (Resnicow, Jackson, Blissett, Wang, McCarty, Rahoteop, & Periassamy, 2005). Results from this study found that the intervention groups increased their physical activities and fruit and vegetable intake at follow-up. In North Carolina, The Black Churches United for Better Health implemented church lead educational activities, coalitions, and events in 50 African-American rural churches in 10 eastern counties (Campbell et al., 1999). This 2 year program reported an average weight loss of 10 pounds and an average decrease in 2.5 inches among the intervention group at follow-up compared to an increase in the control group. However, Young and Stewart (2006) found no statistically significant difference in aerobic exercise or health stretches over a 6 month period among participants in the intervention or control group in 11 African-American churches in the Baltimore area. Although there was no difference among the groups, the program provided participants with proper aerobic and stretching techniques.

Physical activity and Quality of Life

Mikus and colleagues (2012) found that physical activity is an important part of the daily maintenance of glucose levels. The ADA and CDC have created programs aimed at weight reduction, incorporating at least 30 minutes of physical activity, and improved eating habits to prevent the onset of diabetes (ADA, 2013; CDC, 2011b). The ADA currently promotes four diabetes awareness programs geared toward African Americans to increase the awareness, seriousness, and prevention of diabetes. These

programs provide participants with useful resources, monthly activities to be used in a church or community setting. The four programs are *Choose to Live, ID Day, Project Power, and the Diabetes Complication Series* (ADA, 2012a). More specifically, the Diabetes Prevention Program concluded that intensive lifestyle interventions such as individual counseling, physical activity, personalized advice by a trained health professional, and food diaries are useful in preventing diabetes (Penn et al, 2009). This study shows that lifestyle changes can directly impact health issues that are preventable.

The standard of comfort of life encompasses an individual's quality of life. When individuals are diagnosed with diabetes, their quality of life can affect their family and social functioning. Findings by researchers at Grenoble University Hospital suggest that education in adult management of diabetes and quality of life improved from baseline to follow-up (Debaty, et al., 2008). University of California and Northern California Kaiser Permanente Researchers further suggested that family togetherness and social acceptance were positively associated with diabetes quality of life (satisfaction) (Chesla et al., 2004). Research on health and behavior identifies family relationships, including church, social, or extended family relationships, as great targets for interventions to produce positive and significant improvements in health behavior compared to those on an individual level (Bradley, 2009; CDC, 2011; Chelsa et al., 2004).

Power to Prevent

The *Power to Prevent* program was developed by the National Diabetes Education Program (NDEP, n.d.) and designed especially for African-Americans who are at risk for type 2 diabetes. This program was developed in part as a companion piece to

the NDEP *Small Steps, Big Rewards Type 2 Diabetes* campaign which included tip sheets, booklets, and information on taking small steps to improve health and prevent diabetes in the African-American community. The *Power to Prevent* program is designed to encourage African-Americans to become more physically active, while learning to incorporate healthier eating habits to prevent and delay diabetes. The curriculum consists of 12 sessions that cover information on diabetes, healthy eating, importance of physical activity, and building core support. Sessions may last 90 minutes or more depending on participant questions. Each session consists of a welcome, session overview, discussion, activity, pre and post questionnaires, a weekly pledge, affirmation, and a reminder for the next session. Each session has learning objectives that correspond to the session topic. The entire *Power to Prevent* program guide is electronically available at no cost and offers step-by-step lesson plans for each session, links to additional resources, time frame for conducting each class, preparation techniques for conducting the class, and assessments tools. The material is easy to understand and encourages participants to get involved in the classes by use of open-ending questions, hands-on activities, and a sense of empowerment through weekly pledges and affirmations. Unlike other diabetes programs, the *Power to Prevent* curriculum was designed exclusively for the African-American community. The foreword, written by Dr. James Gavin III, past chair of the National Diabetes Education Program (NDEP), advocates that in order to make a difference in African-American communities, researchers and advocates need to reach the people where they live, work, and play. Although the curriculum was not specified to be used in a church setting, based on prior studies utilizing the church for various health programs, the church would make an ideal

venue to incorporate the *Power to Prevent* curriculum. The *Power to Prevent* curriculum presented several advantages that aligned with the proposed dissertation research.

The program guide is divided into several sections: Program Leader's Guide, Group Participant's Guide, Learning Sessions, and Appendices. The Program Leader's Guide provides all the information and necessary step-by-step instructions to implement the program, whereas the Learning Sessions provide the lesson plan for each session. The Group Participants' Guide gives participants an overview of the program. Details of the 12-sessions outline of topics are located on the National Diabetes Education website.

In early 2013, there were no published evaluation studies on the *Power to Prevent* curriculum (Alexis Williams, personal communication, August 13, 2014; & NDEP, n.d.). However, during the implementation of this dissertation in late 2013, researchers from the University of North Carolina at Chapel Hill conducted a feasibility study for the *Power to Prevent* curriculum (Cene et al., 2013). This feasibility study conducted by Cene and colleagues (2013) was through an established academic community partnership across three community settings in North Carolina – consisting of two churches and one nonprofit community organization facility. The established partnership included pastors, nonprofits, community-based organizations, a consulting company, and physician researchers working collectively in planning and implementing all phases of the research. A total of 104 African-American men and women were recruited with 43% completing at least 75% of the 12-session *Power to Prevent* curriculum. Participants were recruited through churches, public service announcements on the radio, community organizations, and word of mouth. Participants received non-monetary incentives such as water bottles, exercise bands, and cookbooks for healthy cooking options. Community Health

Ambassadors lived, and were recruited, in communities where the study occurred. Of the 15 CHAs trained, only four served as *Power to Prevent* curriculum facilitators. In addition to pre and post data collections described by the *Power to Prevent* curriculum, qualitative data was collected to assess the feasibility of the program – demand, acceptability, and implementation. Blood pressure, blood glucose level, and BMI data were also collected. The feasibility indicator for demand suggested that participating churches and 12 additional churches were on board to incorporate health-promoting changes at future church-sponsored events and worship services. The feasibility indicator for acceptability indicated that the material was easy to understand and the time for each session was optimal for delivering the curricular content. However, utilization of the fat and calorie counter and food and activity tracker were overwhelming to participants and were not accurately and continually updated. The feasibility indicator for implementation demonstrated that facilitators administered pre and post curriculum questionnaires and several of the optional curriculum activities as planned. However, the pre and post individual session questionnaires were not administered due to time constraints and literacy concerns.

The researchers concluded that it was difficult to retain participants for the entire study due to the length of time required for the *Power to Prevent* curriculum that was delivered over 7½ months, compared to other studies lasting 3-4 months. Due to the small sample size and high dropout rate, there was a lack of statistical power to demonstrate a true difference. To ensure participants' retention, the researchers suggested increasing incentives, decreasing the session time, and maintaining continual contact with participants between monthly sessions. The researchers also suggested that

improvement to the food and activity trackers and fat and calorie counters tool may increase utilization among participants. Use of CHAs was beneficial in delivering the *Power to Prevent* curriculum. The findings from this feasibility study indicate that *Power to Prevent* curriculum is a very useful educational tool and can be successfully facilitated by CHAs in both faith-based and non-faith-based settings. Furthermore, the researchers suggested that future implementation of the curriculum should be adapted to suit the educational needs and low literacy concerns for the target population.

Several partners of NDEP have utilized some aspect of the *Power to Prevent* curriculum along with other diabetes educational material (NDEP, 2012). For example, a community-based nonprofit in New York, NY, named Health Education on Wheels (HEOW), partnered with community organizations, including churches, to promote outreach events and discuss the health effects of diabetes. The mission statement for HEOW is "to provide free health services, educational services and diagnostic services to individuals with preventable disease" (NDEP, 2012, p.1). Recognizing that diabetes is a growing health concern, HEOW incorporated the 12-session *Power to Prevent* program and additional sponsored materials to help participants learn about diabetes, risk factors, and preventive measures. There were no documented reports of the outcomes.

The World Diabetes Day campaign State Capitol lighting event, in the state of California, utilized many NDEP resources to promote diabetes awareness (NDEP, 2012). Among the resources featured were the *Power to Prevent* curriculum information, *Small Steps, Big Rewards Type 2 Diabetes,* and *Choose More than 50 Ways to Prevent Type 2 Diabetes*. The target population for this campaign consisted of people at risk for diabetes, guardians, local policy makers, and various media outlets. With more than 300

people in attendance, the event combined health fairs, informational brochures on diabetes, healthy food sampling, physical activity options, and inspirational messages. The campaign received so much support that California's governor issued a proclamation recognizing diabetes awareness. Again, there were no documented data on the outcome of this campaign.

Another use of *Power to Prevent* and other NDEP resources is at the Diabetes Treatment Center at Howard University Hospital (NDEP, 2012). In 2010, this treatment center utilized medical mobile units to screen, treat, and educate people living with, and at risk for, diabetes in Washington, DC. The target audience was primarily African-Americans living in the metropolitan area. The mobile unit, which serviced 141 patients, was equipment with trained health care professionals who used several resources for educational workshops, offered additional links to resources (paper and electronically), and provided medical advice. These outreach efforts resulted in an increase in patients' diabetes care knowledge and a decrease in A1C numbers by 1.33%.

The Frederick County Health Department in Maryland was recognized in 2011 by NDEP as the March Partner Spotlight for the use of NDEP's *Power to Prevent* curriculum (NDEP, 2012). Along with the goals of the curriculum for participants to lose 5-7% of weight and increase physical activities by 30 minutes a day, the Frederick County Health Department also encouraged all participants to see a health professional for follow-ups. There were a host of support and in-kind services for 10 different community organizations and groups. A few modifications were made to the curriculum. The sessions were taught by a lay community leader and a registered dietitian, and participants were offered two nutrition counseling sessions with a registered dietitian and

were provided with a website to track physical activities and food eaten. With a total of 57 participants for the pre and post weight measurements, 18% reached the goal of losing 5-7% of weight. Of the 68 participants who completed the pre/post survey for physical activity, 35% of participants engaged in 30 minutes of physical activity at the end of the program.

Although many different outcomes and methodologies are used in diabetes studies, the efficacy of diabetes education is well accepted. One study suggests that there is a great need in the African-American population for diabetes education and management skills (Blanchar, Rose, Taylor, EcEntee, & Latchaw, 1999).

THEORETICAL FRAMEWORK

The use of theory has been discussed in many health education/health behavior/health communication fields. Theory presents a systematic way of understanding events or situations, and explaining health behaviors on an individual, interpersonal, community, group, and organizational level (Glanz & Rimer, 2005). They have also been useful in identifying the four stages of program development: planning, implementation, evaluation, reformation, and generalization (Glanz & Rimer, 2005).

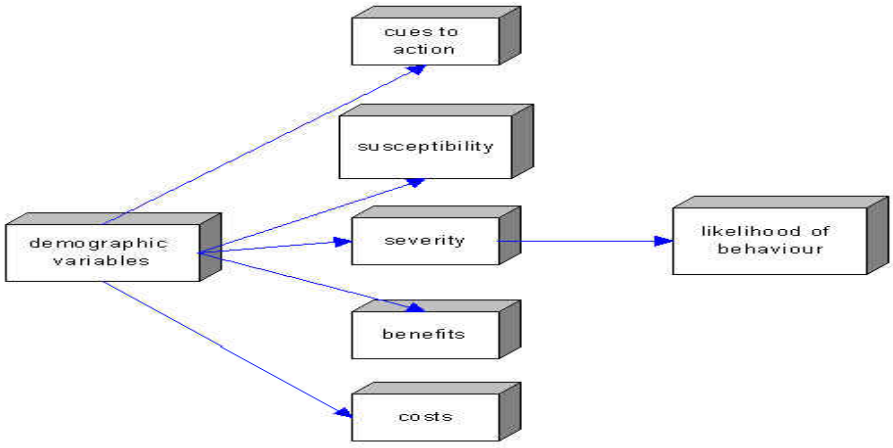
The Health Belief Model (HBM) was developed to explain and predict health behavior that focused on the attitudes and beliefs of an individual (Janz & Baker, 1984). HBM was developed and introduced in the 1950s by Hochbaum and to explain the unsuccessful rates of preventive medical screening programs (tuberculosis) by the U.S. Public Health Service (Becker, 1974; Glanz, Rimer, & Lewis, 2002; Janz & Becker, 1984; National Cancer Institute, 2005). Since its inception, the HBM has been adapted to recognize and understand preventive health behaviors. The Health Belief Model has

been important in understanding behaviors and beliefs related to individual health. It has been a useful framework to examine a range of health behaviors concerns. The HBM consists of the following constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Glanz et al., 2002; Rosenstock, Strecher, & Becker, 1988).

The four main constructs of the HBM are: 1) perceived susceptibility, 2) perceived severity, 3) perceived benefits, and 4) perceived barriers. The theory also includes cues to action and self-efficacy, both of which can affect behavior change. Perceived susceptibility is defined as the belief about the chances of getting a disease or health issue. Perceived severity is defined as the belief about seriousness and consequence of getting a disease or health issue. Perceived benefit is defined as the belief that the effectiveness of taking actions to reduce the risk of a disease or health issue. Perceived barrier is defined as an issue or concern affecting an individual's likelihood of taking action to prevent a disease or health issue (National Cancer Institute [NCI], 2005). Perceived barriers are the strongest predictors across most studies in determining behavior change (Glanz, Rimer & Viswanath, 2008; Janz & Becker, 1984). In order for a new behavior to be adopted, a person must believe that the benefits of the new behavior outweigh the consequence of the old behavior (CDC, 2011b). A person's confidence in his/her ability to perform a given health behavior in the presence of various situations may strongly affect the desired action. Although cues to action and self-efficacy will not be measured in this study, they are very useful. Cues to action are actions or events that prompt individuals to make a change. Self-efficacy can be defined

as a person's confidence in their ability to make a change (NCI, 2005). Figure 1 is a graphic representation of the HBM.

Figure 1. *The Health Belief Model* (Rosenstock, 1966, revised by Becker et al., 1974, 1984)



Individual perception is very important in this theory and in African-American communities. Whether it is about health, education status, or lifestyle and financial status; how people perceive different areas of their life helps to mold their future. Although no theory was identified in this study's diabetes prevention curriculum, the HBM theory allowed the researcher explore how perceived susceptibility, perceived severity, perceived benefits, and perceived barriers affect their health in preventing the onset of diabetes.

Champion and colleagues first developed an instrument based on the Health Belief Model constructs of perceived susceptibility, perceived severity, perceived benefits and perceived barriers in self-examination for breast cancer (Champion, 1984). A questionnaire was developed, and the researcher tested the reliability and validity of a

set of items based on the constructs. Items were formatted to use a Likert scale ranging in value from 5-1. The researcher collected demographic data, developed scales, calculated internal consistency and test-retest reliabilities, and used factor analysis to test the construct validity of the scales. Champion found that the Health Belief Model scales for susceptibility (Cronbach's alpha .78), seriousness (Cronbach's alpha .78), benefits (Cronbach's alpha .61), and barriers (Cronbach's alpha .76) were internally consistent and demonstrated stability with a test-retest correlation coefficient above .7 ($p<.001$).

In 1997, Champion and colleagues adapted the Health Belief Model constructs for an African-American population based on focus group feedback to breast cancer screening behaviors (Champion & Scott, 1997). Scales were tested during a mammography promotion study on 344 African-American women. The adapted scales had internal consistency reliabilities ranging from 0.73 to 0.94 and test-retest reliabilities ranging from 0.40 to 0.68. There were several minor revisions to the wording of several sentences so that the audience would understand the questions asked. Wording changes were made to items related to belief of getting breast cancer in the near future versus the distant future. Also, the item asking about getting cancer in the next 10 years was changed to developing breast cancer is currently a possibility for me.

The Health Belief Model recognizes that wanting to make a health behavior change is not always easy. If an individual believes he or she is not at risk (susceptibility) or does not take maintaining his/her health seriously (severity), the likelihood of taking a proactive approach to a healthier lifestyle is very low. Individuals who perceive themselves to be susceptible to having diabetes based on family history and

believe it to be a serious health concern should be motivated to take proactive preventive measures.

There have been limited studies utilizing the Health Belief Model in the diabetes field. Researchers in one study evaluated the effect of combining an educational program focusing on sugar control and jogging for patients with type 2 diabetes (Kashfi, Jeihooni, Rezaianzadeh & Amini, 2012). The researchers held 3 one-hour sessions on jogging and control of sugar. Participants completed a standard questionnaire, and researchers recorded participants' fasting blood sugar and glycoside hemoglobin before and three months after the jogging intervention. The researchers found that the experimental group showed improvement in jogging as well as improved fasting blood sugar and glycoside hemoglobin levels. The researcher also found that the mean score for perceived susceptibility increased from 52.87 at baseline to 73.71 at the conclusion of the study; perceived severity increased from 50.98 to 74.16; perceived benefits increased from 62.72 to 94.46; and the perceived barriers decreased from 55.52 to 33.40. These findings were statistically significant ($p<0.001$). This study confirmed that using the Health Belief Model was useful in showing changes as a result of an educational jogging program for individuals with diabetes.

Another study focused on family history of first-degree relatives (brother, sister, or child) (Whitford, McGee, & O'Sullivan, 2009). A positive family history of diabetes is a major risk factor and highly associated with individuals developing diabetes. It is also a question asked on the *Diabetes Risk Test*. The aim of this study was to determine how first-degree relatives intervened as health promoters with their family members. In this study, first degree relatives of 607 patients diagnosed with diabetes were invited to

participate in a postal survey questionnaire. A total of 364 questionnaires were returned. The questionnaire consisted of nine sections with constructed answer questions and Likert scale questions about demographics, prevention, perception of family risk, knowledge of risk factors, perception of seriousness, and items similar to those on the *Diabetes Risk Test*. The questionnaire also included the *Health Value Scale* and *Diabetes Onset Locus of Control Scale*.

These scales were used to assess individuals' concerns about developing diabetes and the value they place on their health. Higher scores on both scales indicated a high degree of control for self and a higher value placed on one's health.

The researcher found that 55% of respondents believed that they would develop diabetes some time in their life, and participants ranked diabetes 3rd as a serious condition among cancer, AIDS, arthritis, and flu. The study also showed that respondents placed a high value on health and indicated a high degree of control for self and others in determining development of diabetes with a mean score of 37.6 (95% CI 36.5-38.7). Although respondents identified obesity and little or no exercise as a risk for diabetes, only 52% identified having parents with diabetes or sibling with diabetes as a known risk factor for developing diabetes. Most respondents identified time, lack of motivation, and low desire to prepare healthy food as barriers. The authors concluded that patients with type 2 diabetes should discuss risks and interventions to reduce their relatives' chances of developing diabetes. Although the questionnaire was based on questions using the HBM, they were geared toward first degree family members' experience of a family member having diabetes and did not provide in-depth questions on the major constructs for the HBM.

Conclusion

In this chapter, diabetes types and an overview of milestone diabetes studies among the United States and African-American populations were discussed. Diabetes facts and risk factors in the African-American population were discussed and included information on the newly identified Diabetes Belt. An overview of the American Diabetes Association's *Diabetes Risk Test*, the National Diabetes Education Program *Power to Prevent* program, and the theoretical framework used for this study was also discussed.

CHAPTER THREE

RESEARCH METHODOLOGY

The purpose of this study was to determine if the National Diabetes Education Program *Power to Prevent* curriculum improved diabetes prevention perceptions and behaviors among participants receiving the curriculum. The study tested the effectiveness of *Power to Prevent* specifically designed for African-Americans, paired with scripture in a bible school format, for diabetes prevention in local Baptist churches in Birmingham, AL. Specifically, the study examined diabetes risk levels of participants (*Diabetes Risk Test*); Health Belief Model constructs (perceived susceptibility, perceived severity, perceived benefits, and perceived barriers); and risk management behaviors (exercise, health behaviors, and nutrition) as they relate to diabetes prevention for an intervention and a comparison group.

The researcher submitted this study to the Institutional Review Board (IRB) of The University of Alabama at Birmingham for review and was approved on August 27, 2013. The project was assigned protocol number X130821003 (Appendix C). The researcher began the recruitment in November 2013 and data collection concluded in January 2014. The required consent forms for participants were signed prior to beginning the study.

Research Question

The research study addressed the following research questions derived from the HBM.

1. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease the diabetes risk levels of participants, as evidenced by the

Diabetes Risk Test scores, when compared to levels of participants in a comparison bible study group?

2. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived susceptibility scores of participants when compared to scores from participants in a comparison bible study group?
3. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived severity scores of participants when compared to scores from participants in a comparison bible study group?
4. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived benefits scores of participants when compared to scores from participants in a comparison bible study group?
5. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease perceived barriers scores of participants when compared to scores from participants in a comparison bible study group?
6. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum change risk management behaviors measured (exercise, health behaviors, and nutrition) of participants when compared to measures from participants in a comparison bible study group?

Study Setting

The study was conducted at two Baptist churches in Birmingham, AL. One is a well-established Baptist church (Church A) in the city of Birmingham. Church A was established in 1892 from a prayer band of dedicated Christians. Since its inception,

Church A has been under the leadership of 10 pastors, all dedicated to the work of the Lord. Church A has made numerous accomplishments during the current pastor's leadership. Such accomplishments include, but are not limited to: establishment of the Christian Board of Education; a community based Federal Credit Union; Senior Citizen Housing and Recreational Facility; Christian School (K-5); Membership Revitalization Committee; the establishment of the a prison ministry; several scholarship funds; and an economic development ministry. The church, which has two locations in the West End and South Avondale communities of Birmingham, AL, has a membership of more than 1,500 African-American men, women, and children. During the time of this study, the church offered three Sunday services, four bible study classes and a host of ministry outreach programs. In 2011, a Bible School was established for members to gain a deeper understanding of the bible. The bible school graduated 108 students aged 19 to 75 years in 2012, and 100 students in September 2013. The bible school classes offered undergraduate and master-level classes for six months on Sundays, Tuesdays, and Wednesdays at both campuses. The undergraduate classes offer a basic understanding of the bible from Genesis to Revelation. The master-level classes discuss the major characters in the bible and their importance. The classes are free, and members received a bible scholar degree awarded by the church.

The comparison group consisted of members who attended a separate church in the North Birmingham area (Church B). This church has a membership of 400 African-American men, women, and children. This church is a well-known African-American church in the North Birmingham area and is seeing a steady growth in membership under its newly installed pastor. The church offers two Sunday services, two bible study

classes, and a host of ministry outreach activities. The bible study classes are offered on Wednesdays at 12 noon with 20 participants and at 7 p.m. with 50 participants aged 20 to72 years.

Church A and Church B were selected based on similar bible class structure and regular participation of its members. To prevent cross contamination of information received in the comparison and intervention bible study classes, the selected churches were intentionally located in different geographical areas in Birmingham, Alabama. Although the two churches are different in total membership sizes, the biblical foundations are the same - both pastors have similar teaching styles. The similarities of these teaching styles stem from more than 10 years of working together at Church A.

Study Participants

This study utilized a convenience sample of 63 (n=31 in the comparison group and n= 32 in the intervention group) African-American men and women aged 20 years and older, who are self-identified as members of a bible study program in one of the two churches. This age group is similar to the age group in the CDC studies of diabetes incidence and prevalence (CDC, 2011b). The intervention focused on individuals who are able to make their own health decisions and incorporate steps to diabetes prevention. Although most African-American churches are composed of 60-80% of women and 30% men (Lincoln & Mamiya, 1990), the researcher did attempt to over recruit for male participants by asking the pastors to encourage male participation.

The comparison and intervention group participants were assigned based on the church they attended. The intervention group met on Tuesdays at Church A at the West End campus and received the *Power to Prevent* program. The comparison group met on

Wednesdays at Church B and received diabetes health tips. Based on the normal bible study participants, there is an average of 50 individuals who attend weekly classes in the comparison and intervention group. Sample size was determined for each group based on the attendance of church members who volunteered to participate and attend bible study classes.

Assessment Battery

The assessment battery consisted of the *Diabetes Risk Test* (a measure of risk levels); demographic items (race, education level, marital status, employment status, and income level); revised HBM construct scales (perceived susceptibility, severity, benefits, and barriers); and risk management behavior items. The sections below provide further details.

Diabetes Risk Test

The *Diabetes Risk Test* was included as the first seven items on the questionnaire. Developed by the American Diabetes Association (ADA, 2012a), the *Diabetes Risk Test* is composed of seven items to identify an individual's risk of developing type 2 diabetes. Items include age group, gender, weight status, personal history of gestational diabetes (for women), family history of diabetes, blood pressure status, and physical activity level. Each item receives a score, and item scores are summed to obtain a total score. The risk level is based on the total score, with a score of 5 or more indicating increased risk. Individuals whose score indicates increased risk are instructed to talk to their doctor for additional tests to become aware of their risk.

Revised Susceptibility, Severity, Benefits, and Barriers Scales for Diabetes Screening

The Health Belief Model Scale was developed primarily for breast cancer screening in 1984 and later revised in 1997 by Champion for an African-American population based on focus group feedback (Champion & Scott, 1997). Items from the scale were adapted for this study, modified specifically for diabetes prevention, and tested for content validity using an expert review panel (described later). The modified scale contained 21 items (questionnaire items 13-33) and utilized a 5-point Liker scale ranging from 1, "strongly agree," to 5 "strongly disagree." However, questionnaire items 30-33 were recoded to 1, "strongly disagree," to 5 "strongly agree," to reflect a positive response. The modified scale is comprised of four subscales – three from the revised Champion scale in 1997 (5 items related to susceptibility, 6 items related to benefits of diabetes prevention, and 4 items related to barriers associated with diabetes awareness) and one subscale from the original Champion scale in 1984 (6 items related to seriousness).

The Health Belief Model constructs deal with an individual's perception of a problem. Perceived susceptibility is defined as the subjective risks of contracting a given health condition. Perceived severity is defined as the degree of emotional arousal created by the thought of a disease and the difficulties the disease will create. Perceived benefits are defined as the action(s) believed to be available to an individual and believed to be effective. Perceived barriers are defined as an individual's belief about the physical and psychological cost of taking or engaging in the action (Glanz et al., 2002).

For this study, perceived susceptibility is defined as an individual's belief about the chances of getting diabetes in the near and distant future. Perceived severity is

defined as an individual's belief about the seriousness and consequences of diabetes in the near and distance future. Perceived benefits are defined as an individual's belief in the effectiveness of taking actions to reduce the risk of developing diabetes in the future. Perceived barriers are defined as an individual's belief about potential concerns affecting his/her taking action to prevent diabetes (NCI, 2005). Perceived barriers are the strongest predictors across all studies (Glanz, Rimer, & Viswanath, 2008). This study utilized the HBM constructs to help understand the use of educational interventions as a means to increase knowledge and understanding of diabetes.

Risk Management Behaviors

The pretest-posttest assessments included 11 general items derived from the *Power to Prevent* classes. These items consisted of 6 multiple choice or multiple response items and 5 yes/no items. They included measures of activity level, types of activities, weight status, diabetes status and medication management behaviors, and nutrition behaviors.

Expert Panel Review

An expert panel review was used to assess the content validity of the questionnaire. Content validity was examined to ensure the items on the pretest – posttest questionnaire covered the content that it was expected to measure related to diabetes. The panel consisted of five individuals with diverse backgrounds in survey development, diabetes research, Health Science, and African-American community advocacy. The researcher sent a letter to each member of the panel to explain the study and provide support material to complete the review (Appendix D). A content validity

ratio was obtained using a three point rating scale (Lawshe, 1975). The three point rating scale assessed each item with the following criteria: Essential =2, Useful, but not essential = 1, and Not necessary = 0. As suggested by Lawshe, items with a mean of 1.5 remained on the questionnaire, items with a mean of 1.4-1.0 were reexamined, and items with a mean of 1.0 were removed from the questionnaire. The expert panel suggested that item 44 on the pretest-posttest should list possible answer choices rather than have the more open–ended fill-in response format. The multiple-choice format would allow for easier data analysis. Overall, the panel review indicated that the questions were essential based on their understanding of the research. After receiving feedback from the panel, the researcher made modifications to the pretest- posttest instrument item 44 as recommended. The assessment battery can be found in Appendix E.

Survey Pretesting

The survey was pretested among a convenience sample of 9 African-American women aged 25-45 years attending a sorority committee meeting to determine the internal consistency reliability. The researcher asked each participant to complete the pretest-posttest questionnaire and to identify any concerns or questions. The researcher recorded how much time it took to complete each questionnaire. After completion of the questionnaire, the sample was debriefed and asked to provide feedback on the directions, wording of the questions, wording of the answers, and response categories. It was determined that the survey in its entirety will take an estimated 10 minutes to complete and no revisions were needed.

Procedures

Once permission was obtained from both church pastors, the researcher began to recruit participants during regular bible study class on Tuesday nights at Church A and on Wednesday nights at Church B. The researcher provided each church with recruitment fliers about the 10-week Diabetes Bible Study. Recruitment was conducted over two consecutive weeks at each church. The announcement flier for the comparison group stated that participants will receive weekly health tips on preventing diabetes. The intervention group announcement fliers stated that a series of sessions will be offered to help make changes toward preventing diabetes. The Pastor of each church also announced the 10-week bible study classes during regular church services for members who were not present at the regular bible study. The recruitment fliers used at both churches were developed as part of the *Power to Prevent* curriculum and can be found as Appendix F.

Recruitment for the study began the first week in November 2013 during the regular bible study time for both the intervention and comparison group. Data collection concluded in January 2014. The researcher introduced herself at the beginning of each class and gave a brief overview of the classes. During the first class, the consent forms (Appendix G) were read to the participants and signatures were obtained. The researcher also signed and dated the consent forms and provided each participant with a copy. Only after the participants gave their written consent was the pretest questionnaire administered.

No survey respondents were identified. Each participant used a unique ID assuring that no personal identifiable information was collected. This unique ID was

used to match participant's pre and post responses. Upon completion of the questionnaires, participants placed the questionnaires in a closed box where it was transported to the researcher's office at UAB and stored in a locked file cabinet until data analysis. After data entry of all surveys, all questionnaires were shredded and destroyed to ensure confidentiality.

The potential risks participants may feel include uneasiness with some questions regarding their health status and discomfort disclosing sensitive issues such as income. However during the consent process, participants were informed that they are free to omit answering any questions that may make them uncomfortable.

Both the intervention and comparison groups were assessed twice - once at baseline at the beginning of the 10-week class and again at the conclusion of the 10-week class. The researcher offered to read the questions to participants, and/or allow them to answer the questions on their own. This helped with time management for the class and reduced missing data from the assessments.

The comparison group received weekly diabetes health tips from existing printed material from the National Diabetes Education Program and the American Diabetes Association (Appendix H) during the first 15 minutes of regular bible study on Wednesday nights. Comparison group participants received the weekly health tips in a one sheet handout format.

The intervention group met on Tuesday night and received the *Power to Prevent* program adapted to include biblical scripture (Appendix I) during the discussion portion of each class. The content for the bible study classes for the intervention group included diabetes overview, physical activity, portion size, healthy eating, talking to a health care

provider, and celebrating rewards. The objectives of the classes were to explain diabetes, its risk factors, and preventive measures; to educate participants on physical inactivity and risk associated with obesity; and to educate participants on nutrition and preventive measures to reduce diabetes risk. Each intervention class consisted of a welcome, session overview, review of previous sessions, questionnaires, discussion, and activities. Intervention group activities for each class consisted of a game plan fat and calorie counter, food and activity tracker, weekly pledge, and an individual progress chart to be used and kept by participants. There was also a physical activity for each class that participants were asked to complete before the next session.

The National Diabetes Educational *Power to Prevent* program's content and structure are clearly outlined in the online guide book. The guide provided a "read along" script to help facilitate the sessions and transition to the next class objectives. For example, during Session 1: Introduction to *Power to Prevent*, the discussion points introduced were: "what is diabetes," "what are some complications of diabetes," "who's at risk," "and how to reduce risk" (NDEP, 2010).

Sample Bible Study Class Outline

Each class followed the basic outline detailed below, with the exception of the consent process, pretest, and posttest.

Comparison group – general outline

Step 1 – The pastor or designee opened with a scripture and prayer.

Step 2 – Completion of consent process and pretest at the beginning of intervention and posttest at the conclusion of the intervention.

Step 3 – Introduction of researcher and weekly health tips.

At the beginning of each comparison class, the researcher read the following script before distributing the survey and/or weekly health tips. Each week the health tip information changed. Below is a sample of the week 1 class.

"Good evening everyone. My name is LaToya Bishop and I am a graduate student in the Department of Human Studies at the University of Alabama at Birmingham. I am here to provide you with weekly health tips to prevent diabetes. Today's health tip will focus on the "Diabetes Risk Test"(the tips will change weekly). I'm going to distribute to each of you a copy of this week's tip. I will review its content and answer any questions you have.

(Discuss health tip content here)
"The Diabetes Risk Test consists of seven questions that require your personal response about your age, gender, family history of diabetes, blood pressure, physical activity and weight status. Depending on your response to each question, you will write a 0, 1, 2 or 3 in the box. Once you complete each question, take the sum of your scores. If you score 5 or higher, you are at an increased risk for developing type 2 diabetes and I encourage you to talk to your health professional for a more accurate testing. The good news is that you can reduce your risk, by taking smalls steps, which I will provide to you over a few weeks.

"Remember small steps can lead to big rewards. Thank you for taking the time to receive this health tip on diabetes prevention. If you have any questions about this week's health tip, I will entertain that now. If not, thank you, Pastor, for allowing me to share this information. Again, thank you for your time and your participation."

Intervention group – general outline
Step 1 – The pastor or designee opened with a scripture and prayer.
Step 2 – Completion of consent process and pre-test and the beginning of intervention and posttest at the conclusion of the intervention.

Step 3 – Introduction of researcher and weekly *Power to Prevent* material as outlined in the *Power to Prevent* manual.

At the beginning of each intervention class, the researcher read the structured script as outlined in the *Power to Prevent* manual. Below is a sample of the week 1 class.

"Good evening everyone. My name is LaToya Bishop and I am a graduate student in the Department of Human Studies at the University of Alabama at Birmingham.

Welcome to Power to Prevent. This program is designed to help participants learn HOW to live more healthily, HOW to prevent or delay getting diabetes, and HOW to make changes that will help control diabetes. The program includes health tips on nutrition and physical activity as well as resources and suggestions for simple, fun activities that

you can do individually or with your whole family. Let's begin by getting to know each other." Please introduce yourself.

Session Overview

"Before we begin, I'd like to know more about why you signed up for this program so that I can make it work better for you and can help you achieve your goals. I have a brief questionnaire I would like you to fill out." (Hand out the Pre–Session Questionnaire. Read each question and each answer choice aloud to the group. Offer assistance if needed as the questionnaires are handed out. Collect questionnaires when completed)

"The objectives for today's session are for us to: (1) Describe the goals of this program, which is called Power to Prevent; (2) Discuss the impact that small steps can make in preventing or delaying getting diabetes and in controlling diabetes; and (3) Use tools to take small steps in food choices and in physical activity levels. In future sessions, we'll learn behavioral changes that can help prevent, delay, or control diabetes. In this session we'll spend time learning about tools that we can use to help us make changes in eating and in physical activity levels."

"Now, I will introduce a few questions during the discussion. First, however, I would like to point out what the Bible says about a healthy body. First Corinthians 6:19-20 states that your body is a temple of the Holy Spirit who is in you, whom you have from God, and that you are not your own? In 3 John 1:2 states, Beloved, I pray that in all respects you may prosper and be in good health, just as your soul prospers. We want to have a healthy body mentality when we go into our discussions. So, ponder these questions:

- *What is diabetes? (Discuss the types of diabetes as outlined in Power to Prevent.)*
- *What are some of the complications of diabetes? (Discuss the complications of diabetes as outlined in Power to Prevent.)*
- *Who is at high risk for diabetes? (Discuss individuals at risk for diabetes as outlined in Power to Prevent.)*
- *What can I do to reduce my risk? (Discuss how to reduce risk for diabetes as outlined in Power to Prevent.)*

"After discussion, each participant will receive the Group Participants' Guide, the GAME PLAN Food and Activity Tracker, the Weekly Pledge form, and the Individual Progress Chart. In brief, The Group Participants' Guide gives an overview of the program, describes your role as a group member, and explains the weekly pledge you will make to work toward a goal. The Food and Activity Tracker is an important part of taking small steps in keeping track of everything you eat and drink and your activity levels. You should complete the tracker every day bring it to every session. The Weekly Pledge form is your individual pledge about food, activity, or some other topic that we've discussed during the session. We will discuss sample pledges and allow each of you to make your own.

"We will end this class with the Power of Positive Thinking Affirmation. An affirmation is a motivational quote that you can use to remind yourself of your inner strength and it will keep you on track until our next session.

Preparation and Reminders for the Next Session

"Next week we'll discuss the National Diabetes Education Program theme "Small Steps. Big Rewards." Be sure to use your GAME PLAN Food and Activity Tracker to get a baseline idea about your eating and physical activity this week. Please bring it to our next session. And don't forget to use the affirmation to help you keep your pledge by repeating it to yourself while you walk or in whatever way it helps you the most."

Modifications to *Power to Prevent* for this Intervention

The original *Power to Prevent* program consists of 12 sessions: 6 weekly sessions and 6 monthly sessions. The 6 monthly classes are designed as follow-up sessions to help reinforce topics discussed in the first 6 classes. Due to time constraints for completing this study, the researcher completed the sessions weekly for 10 weeks and condensed 4 sessions into 2 sessions. Also, due to inclement weather in January, there was a two-week gap between classes. The revised 10-week program used for this study is listed in Table 1. (Note that sessions 8 and 9 each had two topics; these were the combined sessions.) The 10-week format includes the first seven weeks of sessions taught as directed by the *Power to Prevent* guide, sessions 8 and 9 both taught as combined sessions, and session 10 as the final session. The maximum amount of time for each session as described in the guide is 90 minutes. However, time was limited to an hour for this study; which is the normal time allotted for bible studies at both selected churches. This was accomplished by keeping the discussion time to a set limit and providing participants with note cards for additional questions to be answered after class. For the two sessions that were combined, these sessions lasted approximately 70 minutes. Attendees who were absent from a particular session received materials in a handout

format as take-home material. They were not excluded from subsequent lessons for the *Power to Prevent* program.

Table 1

Outline of Tips and Topics by Week used in this study

Week	Comparison group	Intervention Group
1	Tips on the Diabetes Risk Test	Intro to *Power to Prevent*
2	Tips on small steps to take for prevention	Small Steps Lead to Big Rewards
3	Tips on Healthy Eating	Strategies For Healthy Eating
4	Tips on Physical Activity	Physical Activity – Get moving today
5	Tips on Healthy Eating	Make Healthy Food Choices one day at a time
6	Tips on Diabetes facts	Diabetes overview
7	Tips on Physical Activities	Physical Activity for the families
8	Tips on portion size & eating out	Portion Size & Navigating Around Eating Out (**combined sessions**)
9	Tips on talking to the doctor and friends & family involvement	Partner w/Health Care Provider & Getting Your Family & Friends involved (**combined sessions**)
10	Overview of weekly tips	Celebrate Big Rewards

Data Entry

Upon completion of the pretest and posttest, the researcher entered all data in an Excel file for both the comparison and intervention group and coded appropriately. The initial step in data cleaning involved the researcher removing any survey for which there was no matching pretest and posttest. The researcher estimated a total of 50 surveys to be collected at pretest and posttest for each group. Initially a total of 41 surveys were collected from the comparison group and 39 surveys collected from the intervention group. Of those, 10 from the comparison group and 7 from the intervention group were

removed from the study due to the absence of either pretest or posttest data. Consequently, a total of 31 comparison and 32 intervention surveys were used in the analysis.

Statistical Analysis

Participants in both the comparison and intervention group had to complete a pretest and a posttest questionnaire to be included in the analysis. All analyses were performed using SPSS Statistics (version 22). Descriptive statistics (frequencies and percentages) were used to summarize *Diabetes Risk Test* items (items 1-7 of the questionnaire) and demographic variables for the study sample, including race, education level, marital status, employment status, and income level (items 8-12 of the questionnaire). Descriptive statistics (means and standard deviations) were computed for *Diabetes Risk Test* scores and for the scales measuring constructs of the Health Belief Model (perceived susceptibility, severity, benefits, and barriers – items 13-33 of the questionnaire). Frequencies and percentages were computed for the items assessing risk management behaviors (physical activity, health behaviors, and nutrition – items 34-44 of the questionnaire).

In addition to descriptive statistics, alpha coefficients were computed to examine the internal consistency reliability of the Health Belief Model construct scales. Reliability is used to determine if scores from an instrument are stable and consistent (Cresswell, 2005). Cronbach's alpha is used to measure the internal consistency among a set of items (Cronbach, 1951). A reliability coefficient of .70 or higher is considered to be acceptable in social science research (Daniel, 1999). For each scale with an alpha coefficient that reached the accepted level, item scores for the scale were summed and

then divided by the number of items to get a score for the construct. In Champion's breast cancer instrument, the benefits construct was below the accepted level, but was used in the study. This construct was identified as a split scale item with another measure and when combined yield an acceptable Cronbach alpha. An option to consider when the alpha coefficient is below the acceptable range is to remove that group of items from the instrument or otherwise modify the scale. However, due to the original instrument reporting and utilizing an alpha coefficient of 0.61, this study proceeded with the items on the questionnaire with the alpha coefficient of .64. A possible explanation for this low alpha coefficient may be due to having only four measureable items and two items were recoded on the answer choices. Questionnaire items 32-33 were recoded to 1, "strongly disagree," to 5 "strongly agree," to reflect a positive response choice.

To answer research questions 1-5, a 2-by-2 repeated measures ANOVA analysis was performed to determine if a difference existed between groups at pretest or at posttest. Repeated measures ANOVA extends the basic ANOVA procedure to a within subject variable. This is a more sensitive test for a treatment effect because it eliminates the influence of individual differences from the analysis (Vogt, 1993). Between-subjects factors test if there is a mean change for groups, whereas within-subjects factors test if there is a mean change difference over time.

The assumptions associated with a two-way repeated measures ANOVA include observations must be independent, populations within each group must be normally distributed, and populations must have equal variance. Shapiro-Wilk's test of normality and Levene's test were used to assess normality and to assess the equality of variances of the two groups. Mauchly's sphericity test was used to test sphericity of the different

levels of the repeated measure factors. The ANOVA results of interest for this study were the group-by-test interaction. A significant interaction indicates that differences between the control and intervention group are not consistent over time. A significant group-by-test interaction required additional analysis to explore the effect of one factor separately at each level of the other factor.

Chi-square analysis was used to answer research question 6. This analysis involved several items on the pretest and posttest. Item 6 from the *Diabetes Risk Test* and item 34 both assessed physical activity. However item 34 provided more detailed responses from participants compared to item 6 from the *Diabetes Risk Test*, and was used to answer research question 6. Weight status was also assessed on item 7 from the *Diabetes Risk Test* and item 37 on pretest and posttest. Because the *Diabetes Risk Test* item 7 provided more detail, it was used as one of the items to answer research question 6. Items 34, 35, and 36 were used to further address physical activity; and items 37 and 38 examined health behaviors related to weight management. Items 41-44 dealt with nutrition behaviors of understanding and use of food labels. Chi-square analysis was considered for items 3, 4, 5, 39, and 40- but was not done due to the low number of "yes" responses.

Several items on the pretest and posttest required recoding of data for statistical analysis. HBM perceived barriers items 32 and 33 were recoded to reflect a positive response. In addition, items 35, 36, 38 and 44 were analyzed to reflect a yes or no responses to each item choice. Items 35, 36, and 38 were further recoded by summing the number of yes responses and collapsing to reflect fewer categories for Chi-square analysis. Response categories for items 9, 11, and 12 were collapsed into fewer groups

because of very low or no responses in some of the categories for education level, marital status, and total household income. Table 2 shows the collapsed items used for Chi-square analysis for questions 35, 36, and 38.

Table 2

Collapsed items using Chi-square analysis

Item	Measuring	Collapsed items used for Chi-square analysis
Item 35	Number of Activities (0-5)	Chi-square analysis used 2 levels: 0-1, and 2 or more responses
Item 36	Number of Activities (0-5)	Chi-square analysis used 3 levels: 0, 1, and 2 or more responses
Item 38	Number of Behaviors (0-5)	Chi-square analysis used 3 levels: 0-1, 2, and 3 or more responses

Conclusion

This chapter described the research design and methods used in this study. Descriptions of the sample, setting, recruitment, and data collection methods, and the modified *Power to Prevent* classes were also provided.

CHAPTER FOUR

RESULTS

The purpose of this study was to determine if the National Diabetes Education Program *Power to Prevent* curriculum improved diabetes prevention perceptions and behaviors among participants receiving the curriculum. The study tested the effectiveness of *Power to Prevent* specifically designed for African-Americans, paired with scripture in a bible school format, for diabetes prevention in local Baptist churches in Birmingham, AL. Specifically, the study examined diabetes risk levels of participants (*Diabetes Risk Test*); Health Belief Model constructs (perceived susceptibility, perceived severity, perceived benefits, and perceived barriers); and risk management behaviors (exercise, health behaviors, and nutrition) as they relate to diabetes prevention for an intervention and a comparison group. This study utilized a self-reporting questionnaire that included (a) the American Diabetes Association's *Diabetes Risk Test*, (b) demographic items, (c) an adaptation of Champion's breast cancer screening (1984 and 1999), and (d) items covering aspects of the National Diabetes Education Program *Power to Prevent* that address risk management behaviors. Chapter Four includes the description of the sample and results of data analysis to answer research questions.

Description of the Sample

The comparison group included 31 participants who attended weekly bible study class on Wednesday nights at a Baptist church in Birmingham, AL (Church B). The intervention group included 32 participants who attended weekly bible study class on Tuesday nights at a Baptist church in Birmingham, AL (Church A). Initially, a total of

41 surveys were collected from the comparison group and 39 surveys collected from the intervention group. Of these, 10 from the comparison group and 7 from the intervention group were removed from the study due to the absence of either pretest or posttest data. This decrease in participation was partly due to the unforeseen severe weather experienced in Birmingham in January 2014. Consequently, a total of 31 comparison and 32 intervention surveys were used in the analysis.

Demographics and diabetes risk characteristics of the two participant groups were compared using demographic items (8-12) and the Diabetes Risk Test (items 1-7). Demographic items included race, educational level, marital status, employment status, and income level. This information for study participants at pretest is presented in Table 3 and 43.

Posttest demographics yielded the same information. Both groups were all self-identified as Black or African American participants. Majority of the participants in both the comparison and intervention group had an Associated/Bachelor degree, employed for wages, and had an income of $26,000 - $59,000 at pretest. However, majority of participants in the comparison group were married (n=15; 48.3%) compared to majority participants in the intervention group was self-identified as single (n=15; 46.8%). There was no difference from pretest to posttest in the demographics for either group.

Additional data for study participants were obtained from the *Diabetes Risk Test* from pretest questionnaires. These results included age group, gender, history of gestational diabetes, family history of diabetes, history of high blood pressure, physical activity, and weight status. Typical participants were women, less than 40 years of age, self-identified as overweight, with a family history of diabetes, and who were not

physical active. Four respondents (12.9%) in the comparison group and two respondents (6.25%) in the intervention group reported being diagnosed with diabetes. The six respondents who were diagnosed with diabetes managed the disease through medication, healthy eating, and exercise. One respondent in the comparison group and three respondents in the intervention group reported having a history of gestational diabetes. There was no difference from pretest to posttest for either group.

Table 3

Demographic Characteristics of the Study Sample at Pretest (Items 8-12)

	Comparison (n=31)		Intervention (n=32)	
Respondent Characteristics	*f*	%	*f*	%
Race**:**				
Black or African American	31	100.0%	32	100.0%
White/Caucasian	0	0.0%	0	0.0%
American Indian or Alaskan Native	0	0.0%	0	0.0%
Hispanic or Latino	0	0.0%	0	0.0%
Native Hawaiian/Pacific Islander	0	0.0%	0	0.0%
Other	0	0.0%	0	0.0%
Education Level:				
Diploma/GED	6	19.3%	3	9.3%
Some College	11	35.4%	7	21.8%
Associate/ Bachelor	12	38.7%	19	59.3%
Masters/Professional/Doctorate	2	6.4%	3	9.3%
Marital Status:				
Single	11	35.4%	15	46.8%
Married	15	48.3%	13	40.6%
Separated/divorced/widowed	5	16.1%	4	12.5%
Employment Status:				
For wages	22	70.9%	29	90.6%
Self employed	3	9.6%	1	3.1%
Out of work/looking	1	3.2%	0	0.0%
Student	3	9.6%	1	3.1%
Retired	3	9.6%	1	3.1%
Unable to work	3	9.6%	1	3.1%
Other	0	0.0%	0	0.0%
Income Level:				
< $25,999	9	29.0%	2	6.2%
$26,000 - $59,999	12	38.7%	17	53.1%
$60,000 +	10	32.2%	13	40.6%

Note: Percentages represent percentages of respondents for the group. Percentages for "Employment" do not sum to 100% because multiple responses were possible.

Table 4

*Participant Responses to **Diabetes Risk Test** Items at Pretest (Items 1-7)*

	Comparison (n=31)		Intervention (n=32)	
Items and Responses	*f*	%	*f*	%
Age group:				
Less than 40 years	13	41.9%	18	56.2%
40-49 years	9	29.0%	9	28.1%
50-59 years	4	12.9%	4	12.5%
60 years or older	5	16.1%	1	3.1%
Gender:				
Man	9	29.0%	8	25.0%
Woman	22	70.9%	24	75.0%
Gestational Diabetes history				
Yes	1	3.2%	3	9.3%
No	30	96.7%	29	90.6%
Family History of Diabetes				
Yes	13	41.9%	14	43.7%
No	18	58.0%	18	56.2%
History of high BP				
Yes	13	41.9%	14	43.7%
No	18	58.0%	18	56.2%
Physical Active				
Yes	9	29.0%	15	46.8%
No	22	70.9%	17	53.1%
Weight Status				
Normal	12	38.7%	13	40.6%
Overweight	15	48.3%	13	40.6%
Obese	4	12.9%	6	18.7%

Research Questions

The following section contains a discussion of each of the research questions addressed during this study.

1. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease the diabetes risk levels of participants, as evidenced by the Diabetes Risk Test scores, when compared to levels of participants in a comparison bible study group?
2. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived susceptibility scores of participants when compared to scores from participants in a comparison bible study group?
3. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived severity scores of participants when compared to scores from participants in a comparison bible study group?
4. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived benefits scores of participants when compared to scores from participants in a comparison bible study group?
5. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease perceived barriers scores of participants when compared to scores from participants in a comparison bible study group?
6. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum change risk management behavior measures (exercise, health behaviors, and nutrition) of participants when compared to measures from participants in a comparison bible study group?

Research Question #1: Does a bible study class based on the Power to Prevent diabetes prevention curriculum decrease the diabetes risk levels of participants, as evidenced by the Diabetes Risk Test scores, when compared to levels of participants in a comparison bible study group?

As previously discussed, the *Diabetes Risk Test* (DRT) is composed of 7 items to identify an individual's risk of developing type 2 diabetes. Each item receives a score, and these scores are summed to get a total score. Risk level is based on the total score, with a score of 5 or more indicating increased risk. Risk score means and standard deviations are displayed in Table 5. In the intervention group, the mean DRT score was 4.09, with a standard deviation of 1.65 at pretest. At posttest, the intervention participants had a mean DRT score of 4.03 with a standard deviation of 1.63. The comparison participants had a mean pretest DRT score of 4.23 with a standard deviation of 2.06; at posttest, the comparison group had a mean DRT score of 4.25 with a standard deviation of 2.08. Figure 2 shows these findings graphically.

Table 5

*Descriptive Statistics for **Diabetes Risk Test** Scores for Intervention and Comparison Participants at Pre-intervention and Post-intervention*

	Pre-Intervention			Post-Intervention		
Group	*N*	*M*	*SD*	*N*	*M*	*SD*
Comparison	31	4.23	2.06	31	4.25	2.08
Intervention	32	4.09	1.65	32	4.03	1.63

Figure 2

Mean Diabetes Risk Test scores of Intervention and Comparison Participants at Pretest and Posttest

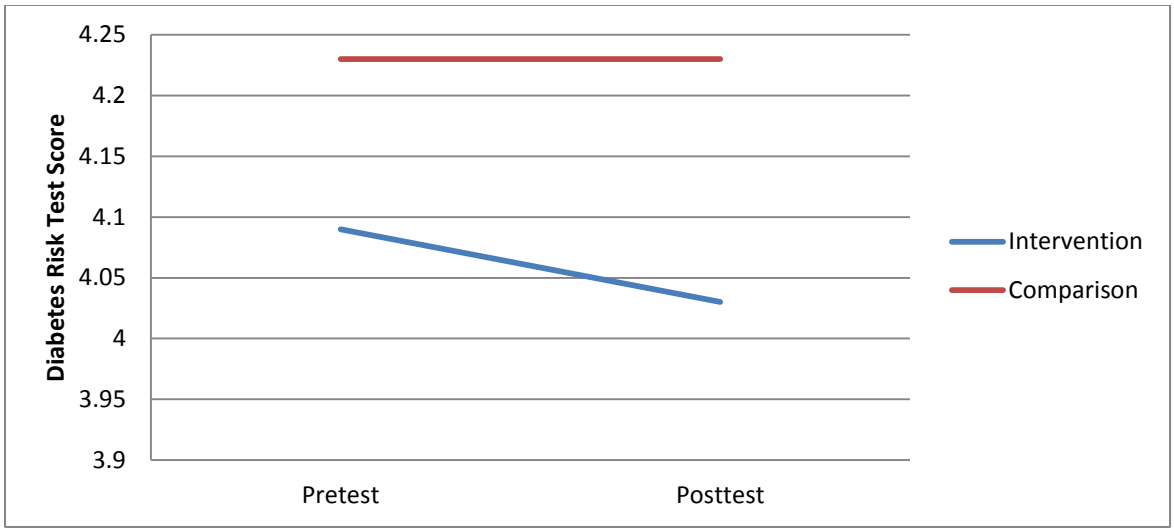


Table 6 presents the ANOVA summary results for the *Diabetes Risk Test* scores. The effect of interest is the interaction. No significant effect was found for the group-by-test interaction (F=.975, p=.327). The diabetes risk levels of the *Power to Prevent* curriculum participants were not different from those of the comparison group at posttest.

Table 6

Diabetes Risk Test *Score ANOVA Summary Table*

Source	*df*	*SS*	*MS*	*F*	*p*
Group (intervention/comparison)	1	1.014	1.014	.147	.703
Error Between	61	420.621	6.895		
Test (pre/post)	1	.007	.007	.099	.754
Group * Test Interaction	1	.071	.071	.975	.327
Error Within	61	4.421	.072		

Research Question 2

Research question #2 - Does a bible study class based on the Power to Prevent diabetes prevention curriculum increase perceived susceptibility scores of participants when compared to scores from participants in a comparison bible study group?

Cronbach's alpha coefficients were calculated for the five items for perceived susceptibility. Descriptive statistics (item means and standard deviations) and item analysis statistics are presented for these five items in Tables 7 and 8. A Cronbach's alpha of .919 was found for susceptibility items 13, 14, 15, 16, and 17. A reliability coefficient of .70 or higher is considered to be an acceptable range. Therefore, item scores were summed and then divided by the number of items to arrive at a score for perceived susceptibility.

Table 7

*Descriptive Statistics for Perceived **Susceptibility** Items for All Participants at pre-intervention (n=63)*

Item	*M*	*SD*
Susceptibility 1	3.365	1.2482
Susceptibility 2	3.571	1.1460
Susceptibility 3	3.508	1.2296
Susceptibility 4	3.381	1.1699
Susceptibility 5	3.159	1.2852

Table 8

*Cronbach's Alpha Item-Total Statistics for Perceived **Susceptibility** Items*

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Pre item 1	13.619	17.724	.822	.714	.894
Pre item 2	13.143	18.537	.818	.714	.895
Pre item 3	13.476	17.641	.849	.727	.888
Pre item 4	13.603	18.953	.746	.584	.909
Pre item 5	13.828	18.308	.724	.568	.914

The means and standard deviations for perceived susceptibility scores are displayed in Table 9. In the intervention group, the mean score was 3.26, with a standard deviation of 1.01 at pretest. At posttest, the intervention participants had a mean score of 3.31 with a standard deviation of 1.19. The comparison participants had a mean pretest score of 3.54 with a standard deviation of 1.10; at posttest, the comparison group had a mean score of 3.58 with a standard deviation of 1.04. Figure 3 shows these findings graphically.

Table 9

*Descriptive Statistics for Perceived **Susceptibility** Scores for Intervention and Comparison Participants at Pre-intervention and Post-intervention*

	Pre-Intervention			Post-Intervention		
Group	*N*	*M*	*SD*	*N*	*M*	*SD*
Comparison	31	3.54	1.10	31	3.58	1.04
Intervention	32	3.26	1.01	32	3.31	1.19

Figure 3

Mean Susceptibility Construct scores of Intervention and Comparison Participants at Pretest and Posttest

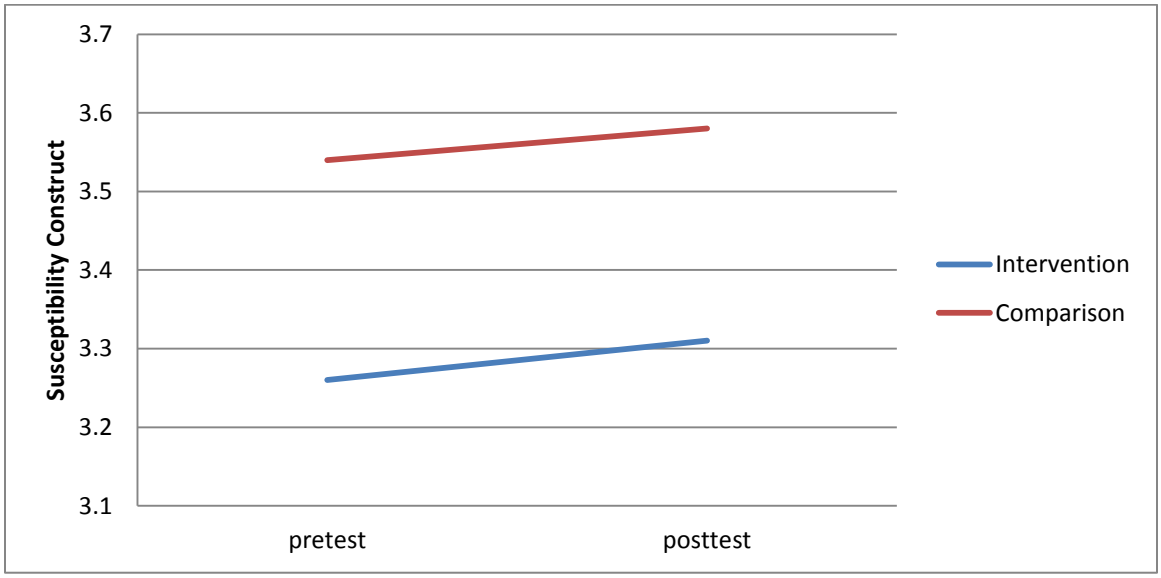


Table 10 presents the ANOVA summary results for the Health Belief Model perceived susceptibility score. The effect of interest is the interaction. No significant effect was found for the group-by-test interaction (F=.028, p=.869). The perceived susceptibility scores of the *Power to Prevent* curriculum participants were not different from those of the comparison group at posttest.

Table 10

HBM Perceived Susceptibility Score *ANOVA Summary Table*

Source	*df*	*SS*	*MS*	*F*	*p*
Group (intervention/comparison)	1	2.415	2.415	1.064	.306
Error Between	61	138.391	2.269		
Test (pre/post)	1	.071	.071	.810	.372
Group * Test Interaction	1	.002	.002	.028	.869
Error Within	61	5.346	.088		

Research Question 3

Research question #3 - Does a bible study class based on the Power to Prevent diabetes prevention curriculum increase perceived severity scores of participants when compared to scores from participants in a comparison bible study group?

Cronbach's alpha coefficients were calculated for the six items for perceived severity. Descriptive statistics (item means and standard deviations) and item analysis statistics are presented for these six items in Tables 11 and 12. A Cronbach's alpha of .728 was found for severity items 18, 19, 20, 21, 22, and 23. A reliability coefficient of .70 or higher is considered to be an acceptable range. Therefore, item scores were summed and then divided by the number of items to arrive at a score for perceived severity.

Table 11

*Descriptive Statistics for Perceived **Severity** Items for All Participants at pre-intervention (n=63)*

Item	*M*	*SD*
Severity 1	2.952	1.2880
Severity 2	3.286	1.2499
Severity 3	4.079	0.9722
Severity 4	3.794	1.0497
Severity 5	3.476	1.1758
Severity 6	3.143	1.1480

Table 12

*Cronbach's Alpha Item-Total Statistics for Perceived **Severity** Items*

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Pre item 1	17.778	15.401	.304	.293	.738
Pre item 2	17.444	13.380	.568	.416	.651
Pre item 3	16.651	16.134	.391	.375	.706
Pre item 4	16.937	15.544	.422	.429	.698
Pre item 5	17.254	14.251	.506	.516	.673
Pre Item 6	17.587	13.795	.589	.484	.647

The means and standard deviations for perceived severity scores are displayed in Table 13. In the intervention group, the mean score was 3.51, with a standard deviation of 0.59 at pretest. At posttest, the intervention participants had a mean score of 3.86 with a standard deviation of 0.48. The comparison participants had a mean pretest score of 3.50 with a standard deviation of 0.78; at posttest, the comparison group had a mean score of 3.48 with a standard deviation of 0.89. Figure 4 shows these findings graphically.

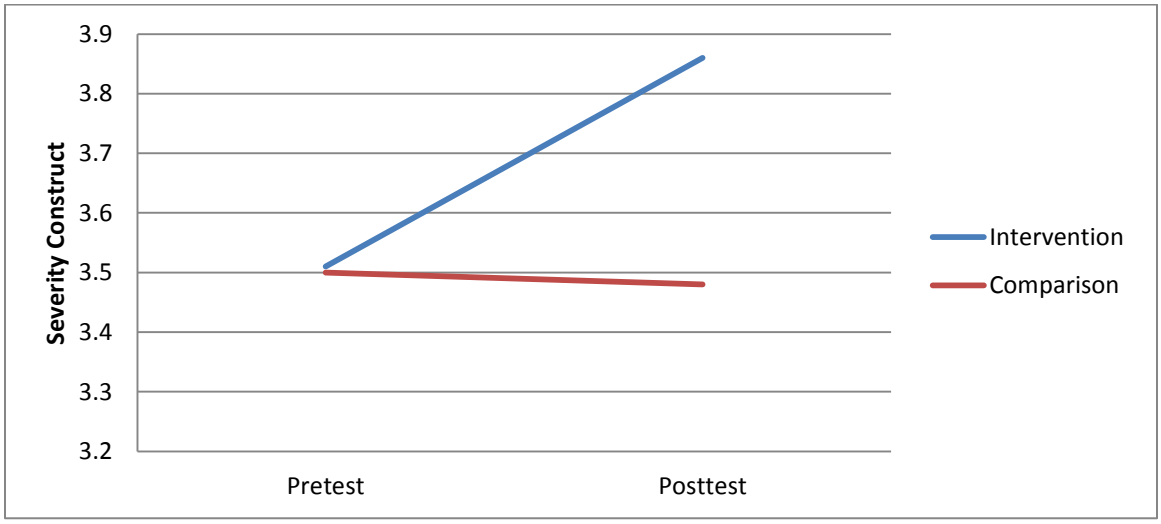
Table 13

*Descriptive Statistics for Perceived **Severity** Scores for Intervention and Comparison Participants at Pre-intervention and Post-intervention*

	Pre-Intervention			Post-Intervention		
Group	*N*	*M*	*SD*	*N*	*M*	*SD*
Comparison	31	3.50	0.78	31	3.48	0.89
Intervention	32	3.51	0.59	32	3.86	0.48

Figure 4

Mean Perceived Severity Scores of Intervention and Comparison Participants at Pretest and Posttest



ANOVA summary results for the Health Belief Model perceived severity score are shown in Table 14. The effect of interest is the interaction. A significant effect was found for the group-by-test interaction (F=9.163, p<.004). Therefore, simple main effects were examined, as presented in Table 15. As the results reveal, there was a significant difference from pretest to posttest for the intervention group (an increase in severity scores), but there was no significant difference from pretest to posttest for the

comparison group. Furthermore, the intervention and comparison groups differed significantly at posttest. Figure 4 depicts these findings.

Table 14

HBM Perceived Severity Score *ANOVA Summary Table*

Source	*df*	*SS*	*MS*	*F*	*p*
Group (intervention/comparison)	1	1.214	1.214	1.395	.242
Error Between	61	53.079	.870		
Test (pre/post)	1	.872	.872	7.698	.007
Group * Test Interaction	1	1.038	1.038	9.163	.004
Error Within	61	6.909	.113		

Table 15

Perceived Severity *Simple Effects Summary Table*

Source	**SS**	**df**	**MS**	**ET**	**F**	F_{crit} **0.05**	F_{crit} **0.01**		
Test@Intervention	2.07	1	2.07	0.113	18.35	3.84	6.63	(df 1,inf)	**
Test@Comparison	0.01	1	0.01	0.113	0.12	3.84	6.63	(df 1,inf)	
Gp @ Pretest	0.00	1	0.00	0.113	0.01	3.84	6.63	(df 1,inf)	
Gp @ Postest	2.27	1	2.27	0.113	20.12	3.84	6.63	(df 1,inf)	**

**=p<.01

Research Question 4

Research Question 4 - Does a bible study class based on the Power to Prevent diabetes prevention curriculum increase perceived benefits scores of participants when compared to scores from participants in a comparison bible study group?

Cronbach's alpha coefficients were calculated for the six items for perceived benefits. Descriptive statistics (item means and standard deviations) and item analysis statistics are presented for these six items in Tables 16 and 17. A Cronbach's alpha of .808 was found for benefits items 24, 25, 26, 27, 28, and 29.A reliability coefficient of

.70 or higher is considered to be an acceptable range. Therefore, item scores were summed and then divided by the number of items to arrive at a score for perceived benefits.

Table 16

*Descriptive Statistics for Perceived **Benefits** Items for All Participants at pre-intervention (n=63)*

Item	*M*	*SD*
Benefit 1	2.048	0.9907
Benefit 2	2.365	1.0821
Benefit 3	2.222	0.8696
Benefit 4	2.095	0.9108
Benefit 5	2.190	0.8773
Benefit 6	2.143	0.8773

Table 17

*Cronbach's Alpha Item-Total Statistics for Perceived **Benefits** Items*

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Pre item 1	11.016	11.726	.480	.360	.792
Pre item 2	10.698	10.859	.552	.391	.777
Pre item 3	10.841	11.716	.586	.447	.768
Pre item 4	10.968	11.612	.567	.465	.771
Pre item 5	10.873	11.564	.608	.763	.763
Pre item 6	10.921	11.655	.591	.786	.767

Displayed in Table 18 are the means and standard deviations for perceived benefits scores. In the intervention group, the mean score was 2.13, with a standard deviation of 0.57 at pretest. At posttest, the intervention participants had a mean score of 2.20 with a standard deviation of 0.43. The comparison participants had a mean pretest score of 2.26 with a standard deviation of 0.70; at posttest, the comparison group had a mean score of 2.30 with a standard deviation of 0.74. Figure 5 shows these findings graphically.

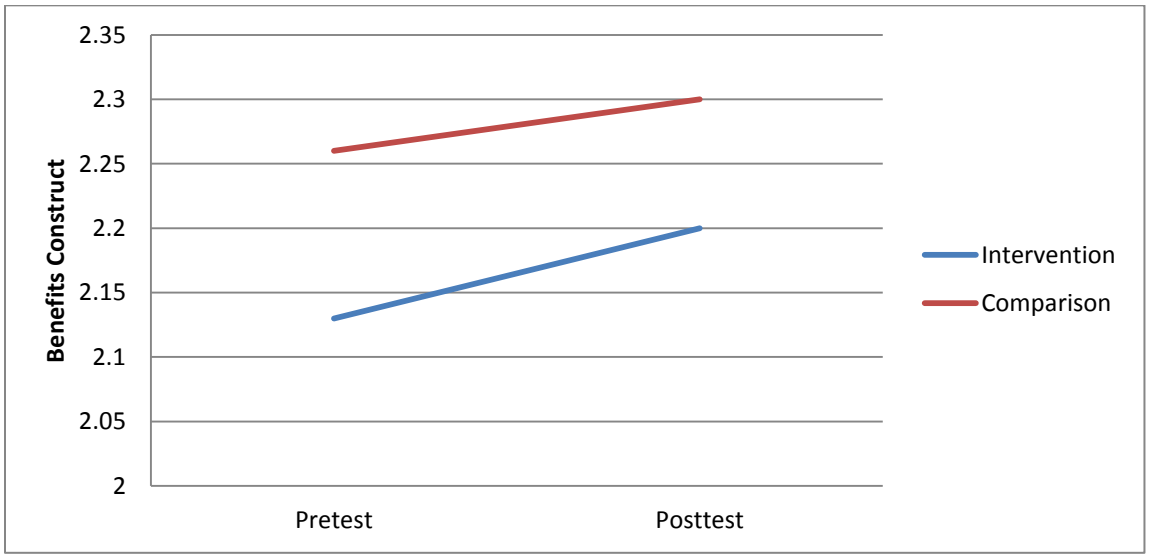
Table 18

*Descriptive Statistics for Perceived **Benefits** Scores for Intervention and Comparison Participants at Pre-intervention and Post-intervention*

	Pre-Intervention			Post-Intervention		
Group	*N*	*M*	*SD*	*N*	*M*	*SD*
Comparison	31	2.26	0.70	31	2.30	0.74
Intervention	32	2.13	0.57	32	2.20	0.43

Figure 5

Mean Perceived Benefits Scores of Intervention and Comparison Participants at Pretest and Posttest



ANOVA summary results for the Health Belief Model perceived benefits scores are shown in Table 19. The effect of interest is the interaction. No significant effect was found for the group-by-test interaction (F=.047, p=.829). Perceived benefits scores of the *Power to Prevent* curriculum participants were not different from those of the comparison group at posttest.

Table 19

HBM Perceived Benefits Score *ANOVA Summary Table*

Source	*df*	*SS*	*MS*	*F*	*p*
Group (intervention/comparison)	1	.446	.446	.654	.422
Error Between	61	41.604	.682		
Test (pre/post)	1	.101	.101	1.211	.275
Group * Test Interaction	1	.004	.004	.047	.829
Error Within	61	5.077	.083		

Research Question 5

Research Question 5 - Does a bible study class based on the Power to Prevent diabetes prevention curriculum decrease perceived barriers scores of participants when compared to scores from participants in a comparison bible study group?

Cronbach's alpha coefficients were calculated for the four items for barriers. A Descriptive statistics (item means and standard deviations) and item analysis statistics are presented for these four items in Tables 20 and 21. Cronbach's alpha of .646 was found for barriers items 30, 31, 32, and 33. A reliability coefficient of .70 or higher is considered to be an acceptable range. As previously discussed, barriers items with a Cronbach's alpha of .64 were used in this study.

Table 20

Descriptive Statistics for Perceived Barriers Items for All Participants at pre-intervention (n=63)

Item	*M*	*SD*
Barriers 1	1.841	0.8074
Barriers 2	2.063	0.9817
Barriers 3	2.397	1.0707
Barriers 4	1.889	0.8819

Table 21

Cronbach's Alpha Item-Total Statistics for Perceived Barriers Items

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Pre item 1	6.349	4.457	.516	.437	.528
Pre item 2	6.127	4.145	.440	.423	.568
Pre item 3	5.794	4.070	.382	.226	.618
Pre item 4	6.302	4.601	.390	.213	.600

Displayed in Table 22 are the descriptive statistics means and standard deviations for perceived barriers scores. In the intervention group, the mean score was 2.06, with a standard deviation of 0.66 at pretest. At posttest, the intervention participants had a mean score of 2.05 with a standard deviation of 0.52. The comparison participant had a mean pretest score of 2.03 with a standard deviation of 0.66; at posttest, the comparison group had a mean score of 1.99 with a standard deviation of 0.62. Figure 6 shows these findings graphically.

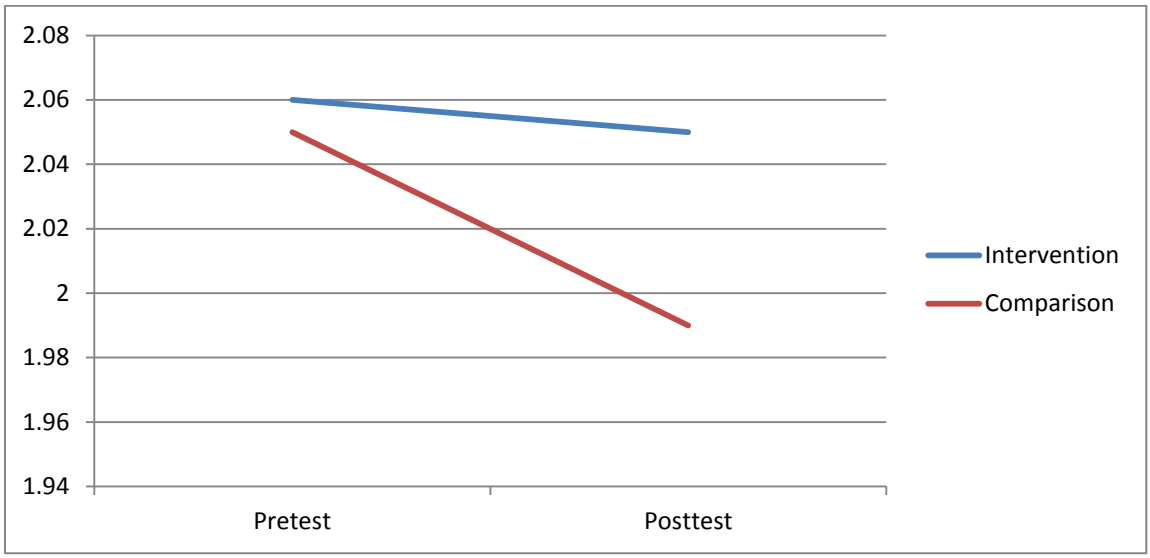
Table 22

*Descriptive Statistics for Perceived **Barriers** Scores for Intervention and Comparison Participants at Pre-intervention and Post-intervention*

	Pre-Intervention			Post-Intervention		
Group	*N*	*M*	*SD*	*N*	*M*	*SD*
Comparison	31	2.03	0.66	31	1.99	0.62
Intervention	32	2.06	0.66	32	2.05	0.52

Figure 6

Mean Barriers Construct scores of Intervention and Comparison Participants at Pretest and Posttest



ANOVA summary results for the Health Belief Model perceived barrier scores are shown in Table 23. The effect of interest is the interaction. No significant effect was found for group-by-test interaction (F=.070, p=.792). The perceived barriers scores of the *Power to Prevent* curriculum participants were not different from those of the comparison group at posttest.

Table 23

HBM Perceived Barriers Score *ANOVA Summary Table*

Source	*df*	*SS*	*MS*	*F*	*p*
Group (intervention/comparison)	1	.057	.057	.083	.775
Error Between	61	42.143	.691		
Test (pre/post)	1	.025	.025	.359	.551
Group * Test Interaction	1	.005	.005	.070	.792
Error Within	61	4.190	.069		

Research Question 6

Research Question 6 - Does a bible study class based on the Power to Prevent diabetes prevention curriculum change risk management behavior measures (exercise, health behaviors, and nutrition) of participants when compared to measures from participants in a comparison bible study group?

Exercise Behaviors

The exercise risk management measures included items 34, 35, and 36 from the questionnaire. These questions are similar in nature to item 6 from the *Diabetes Risk Test* but have more specifically defined response choices for physical activity.

Item 34: In the comparison group, most participants identified having a moderate level of physical activity at pretest and posttest. The intervention group at pretest indicated that the greatest percentage of participants were inactive (31.25%), but changed to moderately physical active at posttest. Results of these findings are in Table 24. A Pearson chi-square was calculated comparing the activity levels for the two groups at pretest and at posttest. Chi-square results for this item revealed no significant relationship at pretest (chi-square (3) = 3.866, $p > .05$), and at posttest (chi-square (4) = 4.510, $p>.05$). Activity level at posttest was not related to group membership (intervention versus comparison).

Table 24

Participant Self-identified Activity Level (Item 34)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
Response	*f*	%	*f*	%	*f*	%	*f*	%
Inactive	6	19.36%	10	31.25%	5	16.13%	9	29.03%
Minimal	7	22.58%	9	28.12%	8	25.80%	10	31.25%
Moderate	15	48.38%	8	25.00%	14	45.16%	11	34.38%
High	3	9.68%	5	15.63%	4	12.90%	2	6.25%
Total	31	100.00%	32	100.00%	31	100.00%	32	100.00%

Item 35: Participants were asked the types of physical activity they were currently doing. Walking was listed as the primary physical activity currently engaged in by both the comparison and intervention group at both pretest and posttest as showed in Table 25. Results for this item were also analyzed by summing the number of activities participants reported. Table 26 indicates that in both the comparison and intervention groups, the majority of participants engaged in one or two physical activities at both pretest and posttest. The greatest percentage engaged in one activity.

Table 25

Physical Activities in Which Participants Currently Engage (Item 35)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
Response	*f*	%	*f*	%	*f*	%	*f*	%
Walking	22	71.0%	15	46.9%	22	71.0%	22	71.0%
Running	7	22.6%	5	15.6%	7	22.3%	5	12.5%
Dancing	4	12.9%	8	25.0%	4	12.9%	7	21.9%
Exercising	14	45.2%	7	21.9%	12	38.7%	6	18.8%
Playing sports	0	0.0%	2	6.3%	0	0.0%	0	0.0%
Other	0	0.0%	7	21.9%	0	0.0%	3	12.5%

Note: Percentages represent percentages of respondents for the group. Percentages do not sum to 100% because multiple responses were possible.

Table 26

Number of Physical Activities in Which Participants Currently Engage (Item 35)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
# of Activities	*f*	%	*f*	%	*f*	%	*f*	%
No Activities	4	12.90%	4	12.50%	1	3.22%	0	0.00%
1 Activity	13	41.94%	15	46.83%	21	67.74%	23	71.88%
2 Activities	8	25.81%	6	18.75%	9	29.03%	7	21.88%
3 Activities	6	19.36%	6	18.75%	0	0.00%	3	9.38%
4 Activities	0	0.00%	0	0.00%	0	0.00%	0	0.00%
5 Activities	0	0.00%	0	0.00%	1	3.22%	0	0.00%
Total	31	100.00 %	3 1	100.00 %	32	100.0%	33	100.00 %

Item 36: Table 27 shows that the majority of the comparison group participants indicated exercise as the activity they would most enjoy at pretest and posttest. The intervention group indicated walking as the primary activity they would enjoy at pretest and exercising as the primary activity at posttest. Results were also analyzed by summing the number of activities participants might enjoy. The majority of participants in both the comparison and intervention groups did not list any activities that they would enjoy at pretest as shown in Table 28. At posttest, the greatest percentage of the comparison group listed two activities and the majority of the intervention group listed one activity that they would enjoy.

Table 27

Physical Activities Participants Indicate They Would Enjoy (Item 36)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
Response	*f*	%	*f*	%	*f*	%	*f*	%
Walking	6	19.3%	15	46.8%	8	25.8%	4	12.5%
Running	8	25.8%	6	18.7%	10	32.3%	9	28.1%
Dancing	18	58.1%	11	34.3%	18	58.1%	5	15.6%
Exercising	31	100.0%	12	37.5%	31	100.0%	12	37.5%
Playing sports	0	0.0%	2	6.2%	0	0.0%	2	6.2%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Note: Percentages represent percentages of respondents for the group. Percentages do not sum to 100% because multiple responses were possible.

Table 28

Number of Physical Activities Participants Indicate They Would Enjoy (Item 36)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
# of Activities	*f*	%	*f*	%	*f*	%	*f*	%
No Activities	19	61.29%	18	56.25%	8	25.81%	5	15.63%
1 Activity	5	16.13%	4	12.5%	9	29.03%	24	77.42%
2 Activities	3	9.68%	5	15.63%	11	35.48%	3	9.38%
3 Activities	3	9.68%	2	6.25%	2	6.45%	0	0.00%
4 Activities	1	3.23%	2	6.25%	1	3.23%	0	0.00%
5 Activities	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Total								

Note: Percentages do not sum to 100% because multiple responses were possible.

Pearson chi-square was calculated using the number of physical activities for items 35 and 36 for both groups at pretest and posttest. For item 35, response choices were collapsed to 0-1 activities and 2 or more activities. The response choices for item 36 were collapsed to 0 activities, 1 activity, and 2 or more activities. Chi-square analysis for item 35 revealed no significant relationship at pretest (chi-square (1)=1.29, $p>.05$) or posttest (chi-square (1)=.794, $p>.05$). Similar results were found for item 36 at pretest (chi-square (2)=8.520, $p>.05$ and posttest (chi-square (2)=4.520, $p>.05$). Data used for chi-square analyses for these items are shown in Tables 29 and 30. Exercise behavior at posttest was not related to group membership (intervention versus comparison).

Table 29.1

Chi-Square Analysis Statistics – Physical Activities Participants are currently doing Item 35 – Pre-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
0-1 Activities	17	.548	22	.688	39	.619
2+ activities	14	.452	10	.313	24	.381
Total	31	1	32	1	63	1

Table 29.2

Chi-Square Analysis Statistics – Physical Activities Participants are currently doing Item 35 – Post intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
0-1 Activities	19	.613	23	.719	42	.667
2+ activities	12	.387	9	.281	21	.333
Total	31	1	32	1	63	1

Table 30.1

Chi-Square Analysis Statistics – Physical Activities Participants would enjoy doing Item 36 – Pre intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
0 activities	19	.613	8	.250	27	.429
1 activity	5	.161	9	.281	14	.222
2+ activities	7	.226	15	.469	22	.349
Total	31	1	32	1	63	1

Table 30.2

Chi-Square Analysis Statistics – Physical Activities Participants would enjoy doing Item 36 – Post intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
0 activities	18	.581	5	.156	23	.365
1 activity	4	.129	24	.750	28	.444
2+ activities	9	.290	3	.094	12	.190
Total	31	1	32	1	63	1

Health Behaviors

DRT Item 7 and questionnaire Item 37: Health Behavior risk management measures included items 37 and 38 from the questionnaire and item 7 from the *Diabetes*

Risk Test. Item 37 and DRT item 7 are similar in nature, but DRT item 7 has more specifically defined response choices for current weight.

DRT Item 7 and Questionnaire Item 37: For item 7, a Pearson chi-square was calculated comparing the results of weight status. Data used for chi-square analyses for these items are shown in Tables 31.1 and 31.2. No significant relationship was found at pretest and posttest (chi-square (2) = .567, $p > .05$. These results indicate that weight status at posttest was not related to group membership (intervention versus comparison). . Descriptive statistics (frequencies and percentages) for item 37 can be found in Tables 32.1 and 32.2.

Table 31.1

*Chi-Square Analysis Statistics –Participant Weight Status from **Diabetes Risk Test** Item 7 – Pre-intervention*

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Normal weight	12	(.38)	13	(.40)	25	(.39)
Overweight	15	(.48)	13	(.40)	28	(.44)
Obese	4	(.12)	6	(.18)	10	(.15)
Total	31	1.00	32	1.00	63	1.00

Table 31.2

*Chi-Square Analysis Statistics –Participant Weight Status from **Diabetes Risk Test** Item 7 – Post-intervention*

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Normal weight	12	(.38)	13	(.40)	25	(.39)
Overweight	15	(.48)	13	(.40)	28	(.44)
Obese	4	(.12)	6	(.18)	10	(.15)
Total	31	1.00	32	1.00	63	1.00

Table 32.1

Descriptive Statistics–Participant that Maintain a Healthy Weight Item 37 – Pre-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Yes	16	.516	23	.718	25	.396
No	15	.483	9	.281	38	.603
Total	31	1.00	32	1.00	63	1.00

Table 32.2

Descriptive Statistics –Participant that Maintain a Healthy Weight Item 37 – Post-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Yes	17	.548	12	.375	29	.460
No	14	.451	20	.625	34	.539
Total	31	1	32	1	63	1

Item 38: Table 33 presents results for item 38. Participants identified healthy eating and exercise as the primary responses to activities that can help maintain a healthy weight. Responses were also analyzed by summing the number of behaviors participants identified. These findings can be found in Table 34. A Pearson chi-square analysis was conducted on the number of healthy behaviors identified by participants at pretest and at posttest. Items were collapsed to 0-1 activities, 2 activities, and 3 or more activities. The results were not statistically significant at pretest (chi-square (2)=.260, $p>.05$) or at posttest (chi-square (2)=.253, $p>.05$). Data used for chi-square analysis are found in Table 35. These results indicate that the number of health behaviors at posttest was not related to group membership (intervention versus comparison).

Table 33

Behaviors Participants Identify That Can Help Maintain a Healthy Weight (Item 38)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
Response	*f*	%	*f*	%	*f*	%	*F*	%
Healthy Eating	28	90.3%	31	96.8%	30	96.7%	29	90.6%
Exercise	27	87.1%	29	90.1%	28	90.3%	31	96.9%
Adherence to Medication	11	35.4%	6	18.7%	10	32.2%	3	9.4%
Regular Check-up	12	38.7%	11	34.3%	14	45.1%	17	53.1%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Note: Percentages represent percentages of respondents for the group. Percentages do not sum to 100% because multiple responses were possible.

Table 34

Number of Behaviors Participants Identify That Can Help Maintain a Healthy Weight (Item 38)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
# of Behaviors	*f*	%	*F*	%	*f*	%	*f*	%
No Behaviors	2	6.4%	1	3.3%	0	0.0%	0	0.0%
1 Behavior	2	6.4%	1	3.3%	3	9.6%	3	9.3%
2 Behaviors	14	45.1%	14	43.7%	16	51.6%	13	40.6%
3 Behaviors	4	12.9%	7	21.8%	10	32.2%	13	40.6%
4 Behaviors	9	29.0%	8	25.0%	3	9.6%	3	9.3%
5 Behaviors	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Totals	31	100.0%	32	100.0%	31	100.0%	32	100.0%

Table 35.1

Chi-Square Analysis Statistics – Number of Behaviors Participants Identify that Can Help Maintain a Healthy Weight - Item 38– Pre-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
0-1 behaviors	4	.129	3	.094	7	.111
2 behaviors	14	.452	16	.500	30	.476
3+ behaviors	13	.419	13	.406	26	.413
Total	31	1	32	1	63	1

Table 35.2

Chi-Square Analysis Statistics – Number of Behaviors Participants Identify that Can Help Maintain a Healthy Weight - Item 38 – Post-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
0-1 behaviors	2	.065	3	.094	5	.079
2 behaviors	14	.452	13	.406	27	.429
3+ behaviors	15	.484	16	.500	31	.492
Total	31	1	32	1	63	1

Items 39 and 40: In response to item 39, a total of four participants in the comparison group and two participants in the intervention group self-identified as being diagnosed with diabetes at pretest and posttest as identified in Table 36. In response to item 40, medication and eating healthy were identified by both groups as the top responses to managing diabetes. Responses to item 39 were also analyzed by summing the number of behaviors as shown in Table 37. Participants identified one to three behaviors they used to manage their diabetes. No chi-square analyses were calculated for responses to items 39 and 40 due to the very small number of participants who self-identified as having diabetes.

Table 36

Participant Self-identified Diagnosis of Diabetes (Item 39)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
Response	*f*	%	*F*	%	*f*	%	*f*	%
Yes	4	12.9%	2	6.2%	4	12.9%	2	6.2%
No	27	87.1%	30	93.7%	27	87.1%	30	93.7%
Total	31	100.0%	32	100.0%	31	100.0	32	100.0%

Table 37.1

Behaviors Participants Use to Manage Their Diabetes (Item 40)

	Pre-intervention				Post-intervention			
	Comparison (n=4)		Intervention (n=2)		Comparison (n=4)		Intervention (n=2)	
Response	*f*	%	*F*	%	*f*	%	*f*	%
Medication	3	75.0%	2	100.0%	3	75.0%	2	100.0%
Eating Healthy	3	75.0%	1	50.0%	3	75.0%	1	50.0%
Exercise	2	50.0%	1	50.0%	2	50.0%	1	50.0%
Nothing	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Note: Percentages do not sum to 100% because multiple responses were possible.

Table 37.2

Number of Behaviors Participants Use to Manage Their Diabetes (Item 40)

	Pre-intervention				Post-intervention			
	Comparison (n= 4)		Intervention (n=2)		Comparison (n=4)		Intervention (n=2)	
# of Behaviors	*f*	%	*f*	%	*f*	%	*f*	%
No Behaviors	0	0.0%	0	0.0%	0	0.0%	0	0.0%
1 Behavior	2	6.4%	1	3.1%	2	6.4%	1	3.1%
2 Behaviors	2	6.4%	0	0.0%	2	6.4%	0	0.0%
3 Behaviors	1	3.2%	1	3.1%	1	3.2%	1	3.1%
4 Behaviors	0	0.0%	0	0.0%	0	0.0%	0	0.0%
5 Behaviors	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Note: Percentages do not sum to 100% because multiple responses were possible.

Nutrition

Nutrition risk management behavior measures included items 41, 42, 43, and 44. These items ask questions related to food labels. The majority of participants read and understood food labels, and found them useful at pretest and posttest. The participants identified food that is healthy as the primary factor when grocery shopping. A Pearson chi-square was calculated comparing the results of food label usage and usefulness. Data used for chi-square analyses are shown in Tables 38 - 41. For item 41, no significant relationship was found at pretest (chi-square (1) = 1.921, $p > .05$) or posttest (chi-square

(1) = 0.016, $p > .05$) for reading food labels when shopping. For item 42, a significant relationship was found at pretest (chi-square (1) = 17.280, $p<.05$) and posttest (chi-square (1) =41.286, $p< .05$) for understanding fool labels. Items 43 also had a significant relationship at pretest (chi-square (1) = 17.286, $p < .05$) and posttest (chi-square (1) = 38.11, $p < .05$) for the usefulness of food labels. For item 44, no significant relation was found at pretest (chi-square (1) = .143, $p > .05$) or posttest (chi-square (1) = .016, $p > .05$) for important factors when buying food. Nutrition behaviors at posttest were not related to group membership (intervention versus comparison).

Table 38.1

Chi-Square Analysis Statistics – Participant Self-identified as reading food labels Item 41 – Pre-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Yes	15	(.577)	11	(.423)	26	(.412)
No	16	(.516)	21	(.568)	37	(.587)
Total	31	1.00	32	1.00	63	1.00

Table 38.2

Chi-Square Analysis Statistics – Participant Self-identified as reading food labels 41 – Post-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Yes	22	(.710)	6	(.188)	28	(.444)
No	9	(.290)	26	(.813)	35	(.555)
Total	31	1.00	32	1.00	63	1.00

Table 39.1

Chi-Square Analysis Statistics – Participant Self-identified as understanding food labels Item 42 – Pre-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Yes	22	(.710)	26	(.813)	48	(.761)
No	9	(.290)	6	(.188)	15	(.238)
Total	31	1.00	32	1.00	63	1.00

Table 39.2

Chi-Square Analysis Statistics – Participant Self-identified as understanding food labels Item 42 – Post-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Yes	22	(.710)	26	(.813)	48	(.761)
No	9	(.290)	6	(.188)	15	(.238)
Total	31	1.00	32	1.00	63	1.00

Table 40.1

Chi-Square Analysis Statistics – Participant Self-identified food labels usefulness Item 43 – Pre-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Yes	24	(.774)	24	(.750)	48	(.761)
No	7	(.226)	8	(.250)	15	(.238)
Total	31	1.00	32	1.00	63	1.00

Table 40.2

Chi-Square Analysis Statistics – Participant Self-identified food labels usefulness Item 43 – Post-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Yes	24	(.774)	24	(.750)	48	(.761)
No	7	(.226)	8	(.250)	15	(.238)
Total	31	1.00	32	1.00	63	1.00

Table 41.1

Chi-Square Analysis Statistics – Participant Self-identified important factors when buying food Item 44 – Pre-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Affordable	5	(.161)	4	(.125)	9	(.142)
Taste Good	8	(.258)	8	(.250)	16	(.253)
Healthy	17	(.548)	13	(.400)	30	(.476)
Quick to prepare	1	(.032)	7	(.219)	8	(.126)
Total	31	1.00	32	1.00	63	1.00

Table 41.2

Chi-Square Analysis Statistics – Participant Self-identified important factors when buying food Item 44 – Post-intervention

	Comparison		Intervention		Total	
Response	N	(Prop)	N	(Prop)	N	(Prop)
Affordable	5	(.161)	10	(.313)	15	(.238)
Taste Good	6	(.194)	8	(.250)	14	(.222)
Healthy	20	(.645)	11	(.344)	31	(.492)
Quick to prepare	0	(.000)	3	(.094)	3	(.047)
Total	31	1.00	32	1.00	63	1.00

Table 42

Participant Self-identified as reading food labels (Item 41)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
Response	*f*	%	*F*	%	*f*	%	*f*	%
Yes	15	57.7%	11	42.3%	22	71.0%	6	18.8%
No	16	51.6%	21	56.8%	9	29.0%	26	81.3%
Total	31	100.0%	32	100.0%	31	100.0%	32	100.0%

Item 42: In response to item 42, majority of participants in the comparison group and intervention group self-identified as understanding food labels at post pretest and posttest as identified in Table 43. A Pearson chi-square was calculated comparing the results of understanding food labels. For item 42, a significant relation was found at

pretest (chi-square (1) = 17.280, $p<.05$) and posttest (chi-square (1) =41.286, $p< .05$) for understanding fool labels.

Table 43

Participant Self-identified as understanding food labels (Item 42)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
Response	*F*	%	*F*	%	*f*	%	*f*	%
Yes	22	71.0%	26	81.3%	22	71.0%	26	81.3%
No	9	29.0%	6	18.8%	9	29.0%	6	18.8%
Total	31	100.0%	32	100.0%	31	100.0%	32	100.0%

Item 43: In response to item 43, majority of participants in the comparison group and intervention group self-identified food labels as useful at both pretest and posttest. As identified in Table A Pearson chi-square was calculated comparing these results. Items 43 also had a significant relation at pretest (chi-square (1) = 17.286, $p < .05$) and posttest (chi-square (1) = 38.11, $p < .05$) for the usefulness of food labels.

Table 44

Participant Self-identified for food labels usefulness (Item 43)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
Response	*F*	%	*F*	%	*f*	%	*f*	%
Yes	24	77.4%	24	75.0%	24	77.4%	32	100.0%
No	7	22.6%	8	25.0%	7	22.6%	0	0.00%
Total	31	100.0%	32	100.0%	31	100.0%	32	100.0%

Item 44: In response to items 44, participants indicated food that is health as an important factor when buying food at pretest and posttest as identified in Table 45. A Pearson chi-square was calculated comparing these results. For item 44, no significant

relation was found at pretest (chi-square (1) = .143, $p > .05$) and posttest (chi-square (1) = .016, $p > .05$) for important factors when buying food.

Table 45

Participant Self-identified importance factors when buying food (Item 44)

	Pre-intervention				Post-intervention			
	Comparison (n=31)		Intervention (n=32)		Comparison (n=31)		Intervention (n=32)	
Response	*F*	%	*F*	%	*f*	%	*f*	%
Affordable	5	16.1%	4	12.5%	5	16.1%	10	31.3%
Taste good	8	25.8%	8	25.0%	6	19.4%	8	25.0%
Healthy	17	54.8%	13	40.6%	20	64.5%	11	34.4%
Quick to prepare	1	3.2%	7	21.9%	0	0.0%	3	9.4%
Total	31	100.0%	32	100.0%	31	100.0%	32	100.0%

Summary

This research consisted of primary analysis for the *Power to Prevent* intervention and comparison bible study churches to determine if a difference exists in *Diabetes Risk Test Scores*, the Health Belief Model constructs, and risk management behaviors (exercise, health behaviors, and the nutrition) of participants. The results of this data analysis may be useful in implementing a diabetes prevention program, such as the *Power to Prevent* curriculum, in a bible study setting to identify its effectiveness.

CHAPTER 5

DISCUSSION AND RECOMMENDATION

Chapter five reintroduces the purpose and study design, summarizes findings and conclusions, discusses study limitations, and offers implications for diabetes prevention programs and recommendations for future research.

Introduction

Diabetes Mellitus (DM) is a metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both (ADA, 2009). When glucose levels fluctuate and the body cannot utilize it properly, individuals are at an increased risk for developing diabetes. Diabetes Mellitus still remains the seventh leading cause of disease-related deaths and is very prominent in the African-American populations (CDC. 2014). Furthermore, it can cause serious health complications such as kidney failure, heart disease, and blindness (CDC, 2014; CDC, 2011b).

Diabetes prevention education is vital in reducing the prevalence of diabetes. Prevention education aids in early detection that can lessen the likelihood of complications associated with diabetes. The purpose of this study was to determine if the National Diabetes Education Program *Power to Prevent* curriculum improved diabetes prevention perceptions and behaviors among participants receiving the curriculum. The study tested the effectiveness of *Power to Prevent* specifically designed for African-Americans, paired with scripture in a bible school format, for diabetes prevention in local Baptist churches in Birmingham, AL. Self-reported data for this research was collected at pretest and posttest for the comparison and intervention groups. The study measured participants' diabetes risk levels (*Diabetes Risk Test*); HBM constructs (perceived

susceptibility, severity, benefits and barriers); and risk management behaviors (exercise, health behaviors, and nutrition) as they relate to diabetes prevention. Studies evaluating a diabetes prevention curriculum specifically designed for the African-American population have not been reported.

All participants in the intervention and comparison groups were self-identified as Black or African-American. Typical participants were women less than 40 years of age, self-identified as overweight, had a family history of diabetes, and were not physical active. Four respondents in the comparison group and two respondents in the intervention group reported being diagnosed with diabetes.

This study investigated the following research questions:

1. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease the diabetes risk levels of participants, as evidenced by the *Diabetes Risk Test* scores, when compared to levels of participants in a comparison bible study group?
2. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived susceptibility scores of participants when compared to scores from participants in a comparison bible study group?
3. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived severity scores of participants when compared to scores from participants in a comparison bible study group?
4. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived benefits scores of participants when compared to scores from participants in a comparison bible study group?

5. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease perceived barriers scores of participants when compared to scores from participants in a comparison bible study group?
6. Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum change risk management behavior measures (exercise, health behaviors, and nutrition) of participants when compared to measures from participants in a comparison bible study group?

Findings and Conclusions

The following summary discusses the central findings and conclusions from each research question.

Research Question 1

Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease the diabetes risk levels of participants, as evidenced by the *Diabetes Risk Test* scores, when compared to levels of participants in a comparison bible study group?

The most widely used self-administered screening test to determine an individual's risk for diabetes is the *Diabetes Risk Test* (DRT) developed by the American Diabetes Association (ADA, 2012a). Risk level is based on the total score, with a score of 5 or more indicating increased risk. In the intervention group, the mean DRT score was 4.09 at pretest, and 4.03 at posttest. The comparison participants had a mean pretest DRT score of 4.23 and a 4.25 at posttest. Results from this study indicated the mean risk

scores for both groups at pretest and posttest were below 5, although African-Americans are considered to have a higher risk for developing diabetes (CDC, 2012). No statistically significant differences were observed in diabetes risk scores between the two groups at pretest or at posttest. No reportable data was found in the literature to compare results of the *Diabetes Risk Test* scores. However, several researchers have suggested that regular exercise may reduce obesity in African-American men and women which would result in decreased health problems (Reed & Henert, 2009; Rosenberg, Kippling-Ruane, Boggs, & Palmer, 2013; Whitt-Glover, Keith, Ceaser, Virgil, Ledford, & Hasson, 2013). One possible explanation for the finding of no significant differences in the Diabetes Risk Test is that most of the items on the test are either based on personal or family history (family history of diabetes) or are not amenable to change in the short term (weight and blood pressure).

Research Question 2

Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived susceptibility scores of participants when compared to scores from participants in a comparison bible study group?

Perceived susceptibility is defined as an individual's beliefs in his/her chance of being vulnerable to getting diabetes (NCI, 2005). For this study, perceived susceptibility score differences between the intervention and comparison groups were not statistically significant at pretest or at posttest. However, research indicated that perceived susceptibility, benefits, and barriers have been found to have a significant correlation

with diabetes behavior and management (Bayat, Shojaeezadeh, Baikpour, Heshmat, Bailkpour, & Hosseini, 2013; Jalilian, Motlagh, Solhi, & Gharibanavaz, 2014). Although results from this study did not find perceived susceptibility to be significant, other researchers found significant results for this construct.

Research Question 3

Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived severity scores of participants when compared to scores from participants in a comparison bible study group?

Perceived severity is the belief that an individual has about the seriousness and consequences of getting diabetes (NCI, 2005). Analysis indicated a significant group-by-test interaction effect for perceived severity, with the intervention group scores increasing from pretest to posttest and the intervention group higher than the comparison group at posttest. These findings suggest that lifestyle interventions, such as *Power to Prevent*, may help reduce an individual's perceived severity related to developing diabetes (DDP, 2002; DDP, 2009). Additionally, some studies suggest that educational interventions involving severity and susceptibility construct measures will produce favorable health behavior changes (Bayat, Shojaeezadeh, Baikpour, Heshmat, Bailkpour, & Hosseini, 2013; Jalilian, Motlagh, Solhi, & Gharibanavaz, 2014).

Research Question 4

Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum increase perceived benefits scores of participants when compared to scores from participants in a comparison bible study group?

Perceived benefit is defined as an individual's belief of the effectiveness of taking actions to reduce the risk of diabetes (NCI, 2005). Perceived benefits scores of the intervention and comparison groups did not differ at pretest or posttest. Although this study did not report significant findings, the *Power to Prevent* curriculum provided useful information for individuals to know their diabetes risk and learn about tools to take action. However, Bayat, Shojaeezadeh, Baikpour, Heshmat, Bailkpour, and Hosseini, (2013) observed a positive and significant impact on HBM constructs following an educational intervention.

Research Question 5

Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum decrease perceived barriers scores of participants when compared to scores from participants in a comparison bible study group?

A perceived barrier is defined as issues or concerns affecting an individual's ability to take action to prevent diabetes (NCI, 2005). Glanz and colleagues inferred that perceived barriers are the strongest predictors across all studies (Glanz, Rimer, & Viswanath, 2008). Similar finding were suggest by Evenson, Moos, Carrier, and Siega-

Riz (2008). However, results for the present study showed no significant differences between the intervention comparison groups for perceived barriers at pretest or posttest.

Research Question 6

Does a bible study class based on the *Power to Prevent* diabetes prevention curriculum change risk management behavior measures (exercise, health behaviors, and nutrition) of participants when compared to measures from participants in a comparison bible study group?

There was no significant difference detected between the comparison and intervention groups at pretest or posttest for risk management behaviors. Although no reportable data was found in the literature to compare results of specific to the *Power to Prevent* diabetes prevention curriculum, the National Association of Chronic Disease (2014) and the National Diabetes Statistics (2011) reported that lifestyle intervention to lose weight and increase physical activity reduced the development of type 2 diabetes by 58%. Nutrition knowledge and physical activity increased among students receiving an intervention (Amaro, Viggiano, DiCostanzo, Madeo, Viggiano, & DeLuca, 2006).

Conceptual Framework

This study involving the implementation of the *Power to Prevent* curriculum found that the intervention and comparison groups did not differ significantly on the HBM constructs of perceived susceptibility, perceived benefits, and perceived barriers at pretest or posttest in both groups. However, the HBM construct of perceived severity

did reveal a statistically significant difference for the intervention group from pretest to posttest and between the two groups at posttest.

Limitations

The church has been a useful setting for promoting health related programs. For this study, the church provided a convenient, familiar, and welcoming environment to receive health tips and the *Power to Prevent* curriculum. Several potential study limitations were discussed in Chapter One

Possible retention challenges did not pose as much of a limitation as expected. Over-all, participant attendance during the 10-week bible study classes remained stable in both groups each week with the exception of those traveling for the holiday or unforeseen weather conditions toward the end of the 10-week classes. Although the retention rate at posttest decreased due to unforeseen weather conditions, findings from the study suggest that the church is an appropriate setting for health education geared toward the African-American population (Newlin, 2012; Kotechi, 2002).

This study implemented the *Power to Prevent* curriculum over a 10-week period versus the original implementation design for 6 weekly session followed by 6 monthly sessions. It is possible, that noticeable change may not occur in a 10-week time period.

Another limitation discussed was data collection through self-reporting. Self-reported data is limited by the fact that it rarely can be independently verified.

Small sample size and convenience sampling were other limitations. Even though this study utilized two different churches, a small sample size still occurred. The small sample size of this study could have contributed to the lack of statistically significant

findings, as statistical tests normally require a larger sample size to ensure both sufficient power and representativeness. Multiple site implementations and larger sample size may adjust for these limitations.

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Recommendations

Implications for Practice or Implementation

Diabetes is a disease that affects many people in our society and is continuing to increase in incidence; therefore, creative educational interventions are needed to decrease diabetes, especially in African-Americans (CDC, 2011a). To reduce the risk of diabetes, individuals must make the necessary lifestyle changes (i.e., increasing fruit and vegetable intake and physical activity). If necessary changes are not made, diabetes will remain a serious health concern with increased complications. Although the majority of the findings for this study were not statistically significant (the HBM severity construct was significant), culturally appropriated interventions may positively influence an individual's perception about diabetes prevention. This study presented the *Power to Prevent* curriculum as an organized diabetes education intervention tool to help reduce the onset of diabetes among participants who attended the 10-week classes in a bible study setting.

Churches have been shown to be a central part of African-American communities. It is easy to capture the attention of many people through their church, especially by raising diabetes awareness and offering creative educational classes. The *Power to Prevent* is a comprehensive educational tool for teaching diabetes prevention techniques. The feasibility study conducted by Cene (2013) indicated that the curriculum can be

successfully implemented by community members with a health background in a faith-based and non-faith based setting.

The teaching tools used in the *Power to Prevent* intervention group were very useful, but may need to be modernized. For example, the food and activity trackers and fat and calorie counters used were administered as directed by the *Power to Prevent* curriculum. These were key teaching tools to help track daily activity and food intake. The researcher may implement the utilization of modern free electronic food and calorie trackers/apps such as My Fitness Pal, MyPlate Calorie Tracker, and Lose it!. The feasibility study conducted by Cene and colleagues (2014) also identified challenges in the utilization of the fat and calorie counters and food and activity trackers as they relate to the literacy level of participants. Although this dissertation did not address any literacy issues, there may be a need to assess health literacy level as suggested by Cene and colleagues.

Due to time constraints, the study was implemented during the holiday months of November, December, and January. Expected holiday travel, family gatherings, and traditional holiday cooking may cause participants not to adhere to learned behaviors from the *Power to Prevent* curriculum. Future implementation of the *Power to Prevent* curriculum classes for the beginning of the year is suggested when New Years goals focus on becoming healthier.

Another suggestion for implementation may include the use of 3 groups instead of the two groups used in this study. In addition to the comparison and intervention group used for this study, the third groups should consist of a true control where no health

materials are shared with participants. This may assist in determining the true impact of *Power to Prevent.*

Recommendations for Future Research

The *Power to Prevent* curriculum is a well-designed tool to encourage African-Americans to become more physically active while learning to incorporate healthier eating habits to prevent and delay diabetes. Diabetes is the seventh leading cause of deaths in the United States and African Americans have a 77% higher rate for developing diabetes than Caucasians. In addition, physical inactivity is a modifiable risk factor in preventing and delaying the onset of diabetes. Although this study modified the time frame of the curriculum and had a small sample size, future studies implementing the curriculum should actively enroll a larger number of participants in *Power to Prevent* in more churches in both urban and rural areas. This expansion will require researchers to start building lasting partnerships with community members. Minor changes to the curriculum may be needed; nevertheless, reducing the rate of diabetes is an important step to improving the health of those at risk.

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APPENDIX A

HEALTH PEOPLE 2020 DIABETES OBJECTIVES

D-1	Reduce the annual number of new cases of diagnosed diabetes in the population
D-2	(Developmental) Reduce the death rate among persons with diabetes
D-3	Reduce the diabetes death rate
D-4	Reduce the rate of lower extremity amputations in persons with diagnosed diabetes
D-5	Improved glycemic control among person with diabetes
D-6	Improved lipid control among persons with diagnosed diabetes
D-7	Increase the proportion of persons with diagnosed diabetes whose blood pressure is under control
D-8	Increase the proportion of persons with diagnosed diabetes who have at least an annual dental examination
D-9	Increase the proportion of adults with diabetes who have at least an annual foot examination
D-10	Increase the proportion of adults with diabetes who have an annual dilated eye examination
D-11	Increase the proportion of adults with diabetes who have a glycosylated hemoglobin measurement at least twice a year
D-12	Increase the proportion of persons with diagnosed diabetes who obtain an annual urinary microalbumin measurement
D-13	Increase the proportion of adults with diabetes who perform self-blood glucose-monitoring at least once daily
D-14	Increase the proportion of persons with diagnosed diabetes who receive formal diabetes education
D-15	Increase the proportion of persons with diabetes who condition has been diagnosed
D-16	Increase prevention behaviors in persons at high risk for diabetes with prediabetes D-16.1 – Increase the proportion of persons at high risk for diabetes with prediabetes who report increasing levels of physical activity D-16.2 – Increase the proportion of persons at high risk for diabetes with prediabetes who report trying to lose weight. D-16.3 – Increase the proportion of persons at high risk for diabetes with prediabetes who report reducing the amount of fat or calories in their diet.

APPENDIX B

SAMPLE OF SUCCESSFUL STUDIES IMPLEMENTED IN A CHURCH SETTING

Sample	Outcomes	Intervention	Results
11 African-American churches in Mississippi Delta	BSE & mammography	Have breast cancer survivors talk to churches	Intervention group increased BSE & mammography screening No change in control group
50 African-American rural churches in 10 eastern North Carolina counties	Fruits & Veggie consumption using frequency questionnaire,	Church led educational activities Community coalition and events	Intervention group lost 10lbs & waist circumference decreased 2.5inches Control group gain 1.9lbs & waist stayed the same
16 African-American churches in Atlanta–	Fruit & veggie intake by food questionnaire; physical activity logs	Culturally targeted self-help Nutrition & physical activity materials	Increase in F&V Consumption and Physical Activity among participants
11 African-American churches in the Baltimore city and county	Physical activity	Aerobic exercise or health Stretch	No difference between intervention groups.

* Campbell, M.K., Hudson, M.A., Resnicow, K., Blakeney, N., Paxton, A., and Baskin, M. (2007). Church-based health promotion interventions: Evidence and Lessons Learned. *Annual Review of Public Health.* 28:213-234.

APPENDIX C

REQUEST FO THE APPROVAL OF RESEARCH INVOLVING HUMAN SUBJECTS

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Institutional Review Board for Human Use

Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The Assurance number is FWA00005960 and it expires on January 24, 2017. The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56.

Principal Investigator:	BISHOP, LATOYA R
Co-Investigator(s):	
Protocol Number:	**X130821003**
Protocol Title:	*Educational Bible Study Classes Focusing on Diabetes – Just Having C.H.U.R.C.H. Controlling How Unhealthy Regimen Can Hurt*

The IRB reviewed and approved the above named project on 8-27-13. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 8-27-13

Date IRB Approval Issued: 8-27-13

IRB Approval No Longer Valid On: 8-27-14

Marilyn Doss

Marilyn Doss, M.A.
Vice Chair of the Institutional Review
Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

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APPENDIX D

EXPERT PANEL REVIEW

Educational Bible Study Classes Focusing on Diabetes – Just Having C.H.U.R.C.H. Controlling How Unhealthy Regimen Can Hurt **IRB PROTOCOL # X130821003**

Dear Panelist,
You are being asked to review survey questions to be used for a pre/post test for a diabetes study entitled "Educational Bible Study Classes Focusing on Diabetes – Just Having C.H.U.R.C.H. Controlling How Unhealthy Regimen Can Hurt". The UAB Institutional Review Board approved the study protocol.

Diabetes prevention education is vital in reducing the incidence and prevalence of diabetes. The purpose of this study is to assess the effectiveness of presenting a well-developed diabetes program specifically designed for African Americans paired with scripture text in a bible school format. The results of this study will assist the researcher in understanding and planning intervention to reduce the onset of diabetes in the African American population.

The items used in this survey are adapted from a breast cancer instrument, which was based on the Health Belief Model, and was validated (Champion, 1984 & 1997). I would like to determine if I have correctly applied diabetes prevention content to my instrument that is also grounded in the Health Belief Model and is relevant for a diabetes study. I specifically adapted questions for the constructs of susceptibility, seriousness, benefits, and barriers from the Health Belief Model.

Your opinion is important to improve the content of the survey before administration to a random sample of African American adults aged 19 and above who attend two local Baptist churches in Birmingham, Alabama. Your estimated time to complete this task is 15 minutes. You may be contacted to discuss your responses in more detail.

Your tasks include:

1) Copy the link to the online survey, below, and paste into your web browser http://www.surveymonkey.com/s/LBexpertreview
2) Mark one response as you preview each survey item.
    a. Indicate whether each item is: Essential; Useful, but not essential; or Not necessary for diabetes prevention in African-Americans.
3) Write your suggestions for improvement beneath the item number.
4) Please click "submit" when done.
5) Please return your completed response to Ms. LaToya Bishop via email at LRBishop@uab.edu, or fax 205-934-5355 by *October 10, 2013*.

Your participation is completely voluntary. I do not anticipate any risk to you if you decide to participate in this review of content exercise, and your responses will be kept confidential. If you have specific questions or concerns about completing the questionnaire, you may contact me via e-mail.

The Institutional Review Board (IRB) at the University of Alabama at Birmingham has approved this study. If you have questions about your rights as a research participant, or

concerns or complaints about the research, you may contact the UAB Office of the IRB (OIRB) at (205) 934-3789 or toll free at 1-855-860-3789. Regular hours for the OIRB are 8:00 a.m. to 5:00 p.m. CT, Monday through Friday. You may also call this number in the event the research staff cannot be reached or you wish to talk to someone else.

Sincerely,
LaToya R. Bishop, MPH
Doctoral Student

APPENDIX E

ASSESSEMENT BATTERY

ASSESSMENT BATTERY

First & last initial, birth day & month

ID# _____

ARE YOU AT RISK FOR TYPE 2 DIABETES?

American Diabetes Association.

Diabetes Risk Test

1. **How old are you?**
   Less than 40 years (0 points)
   40—49 years (1 point)
   50—59 years (2 points)
   60 years or older (3 points)

2. **Are you a man or a woman?**
   Man (1 point) Woman (0 points)

3. **If you are a woman, have you ever been diagnosed with gestational diabetes?**
   Yes (1 point) No (0 points)

4. **Do you have a mother, father, sister, or brother with diabetes?**
   Yes (1 point) No (0 points)

5. **Have you ever been diagnosed with high blood pressure?**
   Yes (1 point) No (0 points)

6. **Are you physically active?**
   Yes (0 points) No (1 point)

7. **What is your weight status?** *(see chart at right)*

Write your score in the box.

Height	Weight (lbs.)		
4′ 10″	119-142	143-190	191+
4′ 11″	124-147	148-197	198+
5′ 0″	128-152	153-203	204+
5′ 1″	132-157	158-210	211+
5′ 2″	136-163	164-217	218+
5′ 3″	141-168	169-224	225+
5′ 4″	145-173	174-231	232+
5′ 5″	150-179	180-239	240+
5′ 6″	155-185	186-246	247+
5′ 7″	159-190	191-254	255+
5′ 8″	164-196	197-261	262+
5′ 9″	169-202	203-269	270+
5′ 10″	174-208	209-277	278+
5′ 11″	179-214	215-285	286+
6′ 0″	184-220	221-293	294+
6′ 1″	189-226	227-301	302+
6′ 2″	194-232	233-310	311+
6′ 3″	200-239	240-318	319+
6′ 4″	205-245	246-327	328+
	(1 Point)	(2 Points)	(3 Points)

You weigh less than the amount in the left column (0 points)

Adapted from Bang et al., Ann Intern Med 151:775-783, 2009.
Original algorithm was validated without gestational diabetes as part of the model.

Add up your score.

If you scored 5 or higher:
You are at increased risk for having type 2 diabetes. However, only your doctor can tell for sure if you do have type 2 diabetes or prediabetes (a condition that precedes type 2 diabetes in which blood glucose levels are higher than normal). Talk to your doctor to see if additional testing is needed.

Type 2 diabetes is more common in African Americans, Hispanics/Latinos, American Indians, and Asian Americans and Pacific Islanders.

For more information, visit us at www.diabetes.org or call 1-800-DIABETES

Visit us on Facebook
Facebook.com/AmericanDiabetesAssociation

Lower Your Risk

The good news is that you can manage your risk for type 2 diabetes. Small steps make a big difference and can help you live a longer, healthier life.

If you are at high risk, your first step is to see your doctor to see if additional testing is needed.

Visit diabetes.org or call 1-800-DIABETES for information, tips on getting started, and ideas for simple, small steps you can take to help lower your risk.

STOP DIABETES.

Directions: Please place a check mark beside your answer for each question.

8) What is your race?
   - ☐ Black or African American
   - ☐ White/Caucasian
   - ☐ American Indian or Alaska Native
   - ☐ Hispanic or Latino
   - ☐ Native Hawaiian/Pacific Islander
   - ☐ Other

9) What is the highest level of education you have **completed**? If currently enrolled, mark the previous grade or highest degree received.
   - ☐ Less than 12^{th} grade
   - ☐ High school diploma/GED
   - ☐ Some college
   - ☐ Associate degree
   - ☐ Bachelor's degree
   - ☐ Master's degree
   - ☐ Professional degree
   - ☐ Doctorate degree

10) What is your current marital status?
   - ☐ Single, Never Married
   - ☐ Married
   - ☐ Separated
   - ☐ Divorced
   - ☐ Widowed
   - ☐ Other

11) What is your employment status? (check all that apply)
   - ☐ Employed for wages
   - ☐ Self-employed
   - ☐ Out of work and looking for work
   - ☐ Out of work and not currently looking for work
   - ☐ A homemaker
   - ☐ A student
   - ☐ Retired
   - ☐ Unable to work
   - ☐ other

12) What is your total household income?
   - ☐ Less than $10,999
   - ☐ $11,000 to $25,999
   - ☐ $26,000 to $35,999
   - ☐ $36,000 to $45,999
   - ☐ $46,000 to $59,999
   - ☐ $60,000 to $99,999
   - ☐ $100,000 or more

Directions: Please read each statement and PLACE A CHECK MARK UNDER YOUR CHOICE to show how strongly you agree or disagree with each statement.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
13) It is extremely likely that I will get diabetes.					
14) My chances of getting diabetes in the next few years are great.					
15) I feel that I will get diabetes sometime in my life.					
16) Developing diabetes is currently a possibility for me.					
17) I am concerned about the likelihood of developing diabetes in the near future.					
18) The thought of diabetes scares me.					
19) My feelings about myself would change if I got diabetes.					
20) Diabetes is a hopeless disease.					
21) My financial security would be endangered if I got diabetes.					
22) Problems I would experience from diabetes would last a long time.					
23) If I had diabetes, my whole life would change.					
24) When I take the Diabetes Risk Test, I'm doing something to take care of myself.					
25) Completing the Diabetes Risk Test often may help reduce my risk for developing diabetes.					
26) If I find that I have diabetes, my treatment for diabetes may not be so bad.					
27) I have a lot to gain by taking the diabetes-at-risk test.					
28) I would not be so anxious about diabetes if I increase my physical activity.					
29) I would not be so anxious about diabetes if I ate healthier.					
30) I am willing to make necessary changes to prevent diabetes					

from occurring.					
31) I will exercise more.					
32) Taking the diabetes risk test is time consuming.					
33) Because of my family history, I don't want to know my risk for developing diabetes.					

Directions: Please place a check mark beside your answer for each question

34) In general how would you describe your activity level
- ☐ Inactive
- ☐ Minimal
- ☐ Moderate
- ☐ High

35) What physical activities are you currently doing (check all that apply)?
- ☐ Walking
- ☐ Running
- ☐ Dancing
- ☐ Exercising
- ☐ Playing sports
- ☐ Other _____

36) If you are not active, what type of activity do you think you would enjoy doing (check all that apply)?
- ☐ Walking
- ☐ Running
- ☐ Dancing
- ☐ Exercising
- ☐ Playing sports
- ☐ Other _____

37) Do you maintain a healthy weight? ___ Yes ___No

38) What can you do to help maintain a healthy weight (check all that apply)?
- a. Healthy Eating
- b. Exercise
- c. Adherence to medication
- d. Regular Check up
- e. Other _____

39) Do you have diabetes? ___ Yes ___No

40) If yes to having diabetes, what are you doing to manage it?

a. Medication
b. Eating Healthy
c. Exercise
d. Nothing
e. Other _____

41) Do you read food labels when shopping? ___ Yes ___No

42) Do you understand the food labels on food products ___ Yes ___No

43) Are food labels useful? ___ Yes ___No

44) Which factor is the most important when buying food (check **one** answer)?

a. Food that is affordable
b. Food that taste good
c. Food that is healthy
d. Food that is quick to prepare

APPENDIX F

RECRUITMENT FLIER

Are you concerned about your Health? Register for a different type of bible study class..

Get the upper hand on diabetes! Beginning in November, your church is offering a series of sessions that can help you and your family make changes towards preventing diabetes.

Come learn more about the program, called A Healthy Plate and a Healthy Weight: A New Program for Diabetes Prevention. The sessions are free, and everyone is encouraged to attend.

Tuesdays from 6-7pm

For more information, call LaToya at [redacted]. Come to the sessions and help prevent diabetes in yourself and your family.

Would you like to receive weekly health tips..

Get the upper hand on diabetes! Beginning in November during Bible Study on Wednesday nights, your church is offering a series of weekly health tips towards preventing diabetes.

The weekly tips are free, and everyone is encouraged to attend.

For more information, call LaToya at [redacted]. Come to the sessions and help prevent diabetes in yourself and your family.

APPENDIX G

PARTICIPANTS INFORMATION SHEET/INFORMED CONCENT

CONSENT FORM

TITLE OF RESEARCH:	Educational Bible Study Classes Focusing on Diabetes – Just Having C.H.U.R.C.H. Controlling How Unhealthy Regimen Can Hurt
IRB PROTOCOL:	**X130821003**
INVESTIGATOR:	LaToya R. Bishop, MPH
SPONSOR:	UAB Human Studies Department

Purpose of the Research

We are asking you to take part in a research study. Diabetes prevention education is vital in reducing the incident and prevalence of diabetes. Early detection and treatment can lessen the likelihood of complication associated with diabetes. The purpose of this study will measure the effectiveness of utilizing diabetes health tips during bible study. The results of this study will assist the researcher in understanding and planning intervention to reduce the onset of diabetes in the African American population. The study will enroll 100 participants in Birmingham, AL.

Explanation of Procedures

You are being asked to participate in a research study. If you participate, you will receive weekly health tips focused on diet, nutrition and physical activity. If you enter the study, you will be placed in the comparison group. The study will last for 10 weeks. Weekly tips will be given during the first 15 minutes of bible study classes. You will also be asked to complete a questionnaire at the beginning and end of the 10 week program about your health, eating habits, physical activity and demographic. The researcher will either read the questions or you may answer the questions on your own.

Risks and Discomforts

The potential risks you may feel include loss of confidentiality, uneasiness with some questions regarding your health status and discomfort disclosing sensitive issues such as income.

Benefits

You may not benefit directly from taking part in this study. However, you may learn to create a healthy lifestyle through proper nutrition and physical activity. In addition, your participation will allow the researcher to design and implement future diabetes educational classes. Your participation will provide valuable information that will be used in helping those working on programs and services. This study may help us better understand how to prevent diabetes in the future.

Alternatives

You may choose not to participate in this study.

Confidentiality

Information obtained about you for this study will be kept confidential to the extent allowed by law. However, research information that identifies you may be shared with the UAB Institutional Review Board (IRB) and others who are responsible for ensuring compliance with laws and regulations related to research, including people on behalf of UAB Department of Human Studies and the Office for Human Research Protections (OHRP). The results of the study may be published for scientific purposes. These results could include your church name. However, your identity will not be revealed.

Voluntary Participation and Withdrawal

Whether or not you take part in this study is your choice. There will be no penalty if you decide not to be in the study. If you decide not to be in the study, you will not lose any benefits you are otherwise owed. You are free to withdraw from this research study at any time.

Cost of Participation

There will be no cost to you for taking part in this study.

Payment for Participation in Research

There will be no cost to you for taking part in this study.

Significant New Findings

Any significant new findings that develop during the course of the class that may affect your willingness to continue in the class will be provided to you by the researchers.

Questions

If you have any questions, concerns, or complaints about the research, you may contact LaToya R. Bishop. She will be glad to answer any of your questions. LaToya's number is.

If you have questions about your rights as a research participant, or concerns or complaints about the research, you may contact the UAB Office of the IRB (OIRB) at (205) 934-3789 or toll free at 1-855-860-3789. Regular hours for the OIRB are 8:00 a.m. to 5:00 p.m. CT, Monday through Friday. You may also call this number in the event the research staff cannot be reached or you wish to talk to someone else.

Legal Rights

You are not waiving any of your legal rights by signing this informed consent document.

Signatures

Your signature below indicates you agree to participate in this study. You will receive a copy of this signed consent form.

Signature of Participant Date

Signature of Principal Investigator Date

Signature of Witness Date

CONSENT FORM

TITLE OF RESEARCH: Educational Bible Study Classes Focusing on Diabetes – Just Having C.H.U.R.C.H. Controlling How Unhealthy Regimen Can Hurt

IRB PROTOCOL: **X130821003**

INVESTIGATOR: LaToya R. Bishop, MPH

SPONSOR: UAB Human Studies Department

Purpose of the Research

We are asking you to take part in a research study. Diabetes prevention education is vital in reducing the incident and prevalence of diabetes. Early detection and treatment can lessen the likelihood of complication associated with diabetes. The purpose of this study will measure the effectiveness of utilizing a well-developed diabetes program specifically designed for African Americans paired with scripture text in a bible school format. The results of this study will assist the researcher in understanding and planning intervention to reduce the onset of diabetes in the African American population. The study will enroll 100 participants in Birmingham, AL.

Explanation of Procedures

You are being asked to participate in a research study designed to evaluate a 10 week diabetes education program to improve the health of your community. If you enter the study, you will be placed in the intervention group. Each class is designed to last 1 hour. If you participate, you will receive weekly tips focused on diet, nutrition and physical activity. You will be asked to participate in discussions, activities and answer questions related to the weekly objectives. You will also be asked to complete a questionnaire at the beginning and end of the 10 week program about your health, eating habits, physical activity and demographic. The researcher will either read the questions or you may answer the questions on your own.

Risks and Discomforts

The potential risks you may feel include loss of confidentiality, uneasiness with some questions regarding your health status and discomfort disclosing sensitive issues such as income.

Benefits

You may not benefit directly from taking part in this study. However, you may learn to create a healthy lifestyle through proper nutrition and physical activity. Your participation will allow the researcher to design and implement future diabetes educational classes. Your participation will provide valuable information that will be used in helping those working on programs and services. This study may help us better understand how to prevent diabetes in the future.

Alternatives

You may choose not to participate in this study.

Confidentiality

Information obtained about you for this study will be kept confidential to the extent allowed by law. However, research information that identifies you may be shared with the UAB Institutional Review Board (IRB) and others who are responsible for ensuring compliance with laws and regulations related to research, including people on behalf of UAB Department of Human Studies and the Office for Human Research Protections (OHRP). The results of the study may be published for scientific purposes. These results could include your church name. However, your identity will not be revealed.

Voluntary Participation and Withdrawal

Whether or not you take part in this study is your choice. There will be no penalty if you decide not to be in the study. If you decide not to be in the study, you will not lose any benefits you are otherwise owed. You are free to withdraw from this research study at any time.

Cost of Participation

There will be no cost to you for taking part in this study.

Payment for Participation in Research

There will be no cost to you for taking part in this study.

Significant New Findings

Any significant new findings that develop during the course of the class that may affect your willingness to continue in the class will be provided to you by the researchers.

Questions

If you have any questions, concerns, or complaints about the research, you may contact LaToya R. Bishop. She will be glad to answer any of your questions. LaToya's number is .

If you have questions about your rights as a research participant, or concerns or complaints about the research, you may contact the UAB Office of the IRB (OIRB) at (205) 934-3789 or toll free at 1-855-860-3789. Regular hours for the OIRB are 8:00 a.m. to 5:00 p.m. CT, Monday through Friday. You may also call this number in the event the research staff cannot be reached or you wish to talk to someone else.

Legal Rights

You are not waiving any of your legal rights by signing this informed consent document.

Signatures

Your signature below indicates you agree to participate in this study. You will receive a copy of this signed consent form.

Signature of Participant Date

Signature of Principal Investigator Date

Signature of Witness Date

APPENDIX H

COMPARISON GROUP – WEEKLY HEALTH TIPS BY TOPICS

Week	Comparison group	Links to weekly health topics
1	Tips on the Diabetes Risk Test	Diabetes Risk test & Pre test
2	Tips on small steps to take for prevention	http://ndep.nih.gov/media/NDEP71_Choose50Ways_4c_508.pdf http://www.ndep.nih.gov/media/ten-ways-african-americans.pdf
3	Tips on Healthy Eating	http://ndep.nih.gov/resources/ResourceDetail.aspx?ResId=189
4	Tips on Physical Activity	http://ndep.nih.gov/resources/ResourceDetail.aspx?ResId=202
5	Tips on Healthy Eating	http://ndep.nih.gov/resources/ResourceDetail.aspx?ResId=207
6	Tips on Diabetes facts	http://ndep.nih.gov/media/fs_gensnapshot.pdf
7	Tips on Physical Activities	http://ndep.nih.gov/resources/ResourceDetail.aspx?ResId=203
8	Tips on portion size & eating out	http://www.choosemyplate.gov/healthy-eating-tips/tips-for-eating-out.html http://www.choosemyplate.gov/print-materials-ordering/graphic-resources.html
9	Tips on talking to the doctor and friends & family involvement	http://ndep.nih.gov/resources/ResourceDetail.aspx?ResId=333 http://ndep.nih.gov/resources/ResourceDetail.aspx?ResId=302
10	Overview of weekly tips	

APPENDIX I

SCRIPTURES USED DURING DISUCSSION OF INTERVENTION GROUP

1 Corinthians 3:16	Do you not know that you are God's temple and that God's Spirit dwells in you?
1 Corinthians 6:19-20	Or do you not know that your body is a temple of the Holy Spirit within you, whom you have from God? You are not your own, for you were bought with a price. So glorify God in your body.
1 Corinthians 10:31	So, whether you eat or drink, or whatever you do, do all to the glory of God.
3 John 1:2	Beloved, I pray that all may go well with you and that you may be in good health, as it goes well with your soul.
Genesis 1:29	And God said, "Behold, I have given you every plant yielding seed that is on the face of all the earth, and every tree with seed in its fruit. You shall have them for food.
Romans 12:1-2	I appeal to you therefore, brothers, by the mercies of God, to present your bodies as a living sacrifice, holy and acceptable to God, which is your spiritual worship. Do not be conformed to this world, but be transformed by the renewal of your mind, that by testing you may discern what is the will of God, what is good and acceptable and perfect.
Isaiah 1:19	If you are willing and obedient, you shall eat the good of the land;
Philippians 4:13	I can do all things through him who strengthens me.
Philippians 4:19	And my God will supply every need of yours according to his riches in glory in Christ Jesus.
Mark 11:24	Therefore I tell you, whatever you ask in prayer, believe that you have received it, and it will be yours.
Ecclesiastes 11:10	Remove vexation from your heart, and put away pain from your body, for youth and the dawn of life are vanity.
Revelations 14:12	Here is a call for the endurance of the saints, those who keep the commandments of God and their faith in Jesus.