

THE EFFECTS OF PROJECTPOWER DIABETES EDUCATION PROGRAM ON
ADULT AFRICAN AMERICANS' DIABETES KNOWLEDGE,
EMPOWERMENT, AND READINESS TO CHANGE

A DISSERTATION

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BY

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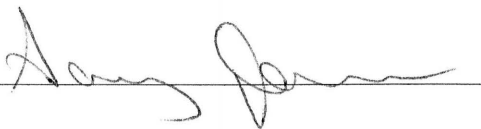
To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Sherry Grover entitled "The Effects of ProjectPower Diabetes Education Program on Adult African Americans' Diabetes Knowledge, Empowerment, and Readiness to Change." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Health Studies.

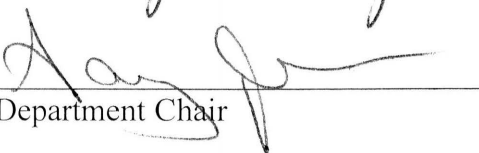


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We have read this dissertation and recommend its acceptance:







Department Chair

Accepted:



Dean of the Graduate School

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I would like to first thank God for giving me the opportunity to pursue this doctoral dissertation. Not only did He hold true to His Word that He would give me the desires of my heart but He also held true to His Word that “I can do all things through Christ which strengthens me” (Philippians 4:13, New King James Version).

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ABSTRACT

SHERRY GROVER

THE EFFECTS OF PROJECTPOWER DIABETES EDUCATION PROGRAM ON ADULT AFRICAN AMERICANS' DIABETES KNOWLEDGE, EMPOWERMENT, AND READINESS TO CHANGE

MAY 2009

The primary purpose of this study was to assess whether a faith-based diabetes education program (ProjectPower) would significantly influence African American's knowledge, readiness to change, and feelings of empowerment about diabetes care. A secondary purpose of this study was to examine the ecological factors that would affect knowledge, readiness to change, and feelings of empowerment about diabetes care. A volunteer convenience sample of 48 church members, family and friends participated in the study. The inclusion criteria were: African American male and females ages 18 years and older that lived in Houston/Harris County, Texas and surrounding areas. Those with or without diabetes participated. The majority of the participants were female (79.2%), and 20.8% were males. Participants were, on average, 60 years of age ($M = 60.52$, $SD = 15.00$) and ranged from 18 years to 82 years of age. The study used a pre-test/post-test survey design that included both open-ended and closed-ended questions. Participants were tested both before and after a three-module workshop. Participants were also invited to participate in a one-month follow-up survey. Data analyses included frequencies, ANOVA, and Pearson's Product Moment correlations. Results indicated

that the diabetes knowledge test scores were significantly higher at the time of post-test compared with results at the time of pre-test, while neither the readiness-to-change scores nor the diabetes empowerment change scores were significantly different between the pre-test and post-test. There was a significant trend between all the pre-test and post-test scores as participants who had higher scores on the pre-test tended to have higher scores on the post-test.

The results of this study may be used to refine the process that is currently being used by the American Diabetes Association (ADA) to implement programs in churches. Although the results of this study cannot be generalized, education does seem to have a significant impact on diabetes knowledge. ProjectPower programs are currently being held year-round; and based on the results of this study ProjectPower modules can increase participants' knowledge when conducted in 45 minutes. Goal-setting components built into the program such as the "commitment cards" could be used to empower participants to change. Finally, additional program planning efforts could include components such as resilience education and support groups based upon available funds and volunteers.

TABLE OF CONTENTS

	Page
COPYRIGHT	iii
ACKNOWLEDGMENTS	iv
ABSTRACT.....	v
LIST OF TABLES	xi
Chapter	
I. INTRODUCTION	1
Purpose of the Study	2
Hypotheses.....	3
Research Questions.....	3
Delimitations.....	4
Limitations	4
Assumptions.....	5
Definitions of Terms	5
Significance of the Study	6
II. LITERATURE REVIEW	7
Prevalance of Type 2 Diabetes	7
Epidemiology and Complications.....	9
Risks.....	9
Symptoms	10
Financial Impact.....	11
Diabetes and Healthy People 2010	11
Health Education.....	12
Use of Church-based Programs	13
Pastor and Members Views	13
Impact of Tuskegee.....	14
Culturally Competent Research with African Americans	15
Ecological Model	16

Intrapersonal Influencers.....	16
Interpersonal Influencers.....	17
Community Influencers.....	17
Policy Influencers	20
Dietary Patterns and the Ecological Model.....	20
Exercise and the Ecological Model	21
ProjectPower	22
Module 1 – Diabetes Day & Power Over Diabetes (Introduction to Diabetes).....	23
Module 2 – O Taste and See (Healthy Eating).....	25
Culturally Competent/Diet.....	25
Focus Groups: African Americans’ Perceptions about Diet.....	28
Results from African Americans’ Participation in Diet Studies	28
Module 3 – Fit for the Master’s Use (Physical Activity).....	29
What are African Americans’ Perceptions about Physical Activity?	29
African American Participation in Physical Activity Studies Related to Diabetes	30
Health Education Theories and Diabetes.....	31
Empowerment.....	31
Stages of Change	32
Other Participation in ProjectPower	35
Diabetes Health in Faith-based Organizations Including African Americans.....	36
Diabetes Health in the Community.....	37
Conclusion and Gaps	37
III. METHODOLOGY	39
Study Design	39
Sampling	39
Data Collection Process	39
Informed Consent	40
Study Instruments.....	41
Instrument Reliability	42
Workshop Procedure	43
Data Analysis	45
IV. RESULTS	46
Demographics.....	46
Instrument Reliability	52

Primary Analysis	63
Qualitative Data.....	65
Follow-up Data.....	70
Summary	73
V. DISCUSSION	75
Implications.....	75
Knowledge Test Scores.....	76
Empowerment Scores	77
Readiness to Change Scores.....	77
One Month Follow-up.....	79
Ecological Assessment and Project Power	80
Intrapersonal	80
Interpersonal	81
Community	81
Policy.....	82
Limitations	83
Future Research.....	85
Conclusion	86
REFERENCES.....	88
APPENDICES	
A. FLYER FOR DISTRIBUTION.....	104
B. SCRIPT FOR CHURCH TV AND BULLETINS	106
C. SCRIPT FOR PRAISE 92.1.....	108
D. WORKSHOP MODULES	110
E. COVER LETTER.....	112
F. DEMOGRAPHIC SHEET PRE-TEST.....	114
G. DIABETES KNOWLEDGE PRE-TEST.....	116
H. PRE-TEST ATTITUDES TOWARDS DIABETES (DES)	118
I. ADDITIONAL QUESTIONNAIRE POST-TEST	120

J. CONSENT TO PARTICIPATE.....	122
K. SCRIPT FOR PARTICIPANTS.....	126
L. DIABETES KNOWLEDGE POST-TEST FOR PROJECTPOWER.....	128
M. POST-TEST ATTITUDES TOWARDS DIABETES (DES)	130

LIST OF TABLES

Table	Page
1. Frequencies and Percentages for Gender, Marital Status, Number of Children, Education Level, and Income Level	47
2. Descriptive Statistics for Age, Height, Weight, Total Minutes Exercised per Week	48
3. Frequencies and Percentages for Diabetes Diagnosis, Years since Diagnosis, Diabetes Education, Years since Diabetes Education, and Diabetes Support Group Attendance	49
4. Frequencies and Percentages for Exercise, Exercise per Week, Exercise per Day, Examine Feet	51
5. Frequencies and Percentages for Diabetes Knowledge Item Answers for Pre-test.....	53
6. Frequencies and Percentages for Diabetes Knowledge Item Answers for Post-test	56
7. Frequencies and Percentages for Diabetes Knowledge Item Correct Versus Incorrect Answers for Pre-test	59
8. Frequencies and Percentages for Diabetes Knowledge Item Correct Versus Incorrect Answers for Post-test.....	61
9. Means and Standard Deviations for Pre and Post Diabetes Knowledge Test Scores, Readiness to Change Scores, and Diabetes Empowerment Scale Scores	64
10. Pearson's Product Moment Correlations for Pre and Post Diabetes Knowledge Test, Readiness to Change Scores, and Diabetes Empowerment Scale Scores.....	65
11. Ecological Assessment of Factors That May Affect Diabetes Care	68

12. Frequencies and Percentages for Follow-Up Test of Diabetes Knowledge Items	70
13. Frequencies and Percentages for Follow-Up Diabetes Empowerment Scale Items	71
14. Summary of Null Hypotheses: Rejected or Not Rejected	75

CHAPTER I

INTRODUCTION

African Americans are disproportionately affected by diabetes. Approximately 3.2 million African Americans over the age of 18 have diabetes, and 95% of these cases are type 2 (American Diabetes Association [ADA], n.d.a). Furthermore, African Americans are 1.8 times more likely to have diabetes than non-Hispanics and Caucasians. In addition, among people with diabetes, African Americans are 1.5 to 2.5 times more likely than other ethnic groups to suffer from lower limb amputation (ADA).

Approximately 724,258 or 18.6% of the population in Harris County, Texas, which has been targeted for diabetes education, are African American (U. S. Census Bureau [USCB], 2006). According to the 2005 Texas Behavioral Risk Factor Surveillance System Survey (BRFSS), 16.3% of Harris County residents participating in the survey reported they had been told by a doctor they had diabetes (Houston Department of Health and Human Services and Harris County Public Health & Environmental Services, 2006). Two Congressional Districts in Harris County reported having the largest populations of African Americans with diabetes. In 2006, approximately 262,256 or 38.2 % of the population in Congressional District 18 were African American compared to 250,167 or 35.9% of the population in Congressional District 9 (USCB). In 2007, 6% of the population in Congressional District 18 was

diagnosed with diabetes compared to 5.2 % of the population in Congressional District 9 (ADA, n.d.b).

In an effort to address these diabetes health outcomes in the African American community, the ADA has implemented a faith-based diabetes education program to be conducted through churches. As Carter-Edwards, Fisher, Vaughn, and Svetkey (2002) reported, “it is well established that religious institutions have served as channels for delivery of health and education services” (p. 42). In fact, African American churches have a long history in supporting health care, which dates back to the Negro Health Movement in 1915 (Thomas, Quinn, Bilingsley, & Caldwell, 1993). In a study conducted by Thomas et al., data collected from over 600 churches indicated that the churches had conducted some type of health program. Health programs, especially those utilizing social support, are a “natural arena of the church” (Thomas et al., p. 576).

For this reason, the ADA developed ProjectPower, a year-round diabetes awareness program targeted at African American churches. The church can promote awareness messages and healthy family living by participating in a three-module course (ADA, n.d.c). The program goals are to raise awareness about diabetes, to establish collaboration with churches, to increase knowledge about diabetes, and increase feelings of empowerment toward increasing healthy eating and exercise (Wade, 2005).

Purpose of the Study

The primary purpose of this study was to assess whether a faith-based diabetes education program (ProjectPower) will significantly impact African Americans’ knowledge, readiness to change, and feelings of empowerment about diabetes care. A

secondary purpose of this study was to examine the ecological factors that may affect knowledge, readiness to change, and feelings of empowerment about diabetes care. The results will assist in refining program content to improve participant outcomes.

Hypotheses

The following null hypotheses were tested at .05 alpha level of significance in this study:

1. There is no significant difference between participants' pre-test diabetes knowledge scores and participants' post-test knowledge scores following the intervention.
2. There is no significant difference between participants' pre-test readiness to change scores and post-test readiness to change scores following the intervention.
3. There is no significant difference between participants' feelings of empowerment pre-test and feelings of empowerment post-test scores following the intervention.
4. There is no statistically significant difference in participants' post-test knowledge, readiness to change, and feelings of empowerment scores one month after the intervention compared to the first post-test.

Research Questions

The following research questions were addressed:

1. How do African Americans with type 2 diabetes perceive the disease?
2. What factors do African Americans with type 2 diabetes report impact their diabetes care (positive or negative)?
3. What are the concerns of African Americans with type 2 diabetes?
4. How do African Americans perceive faith-based diabetes education programs?

5. What do African Americans participating in ProjectPower perceive to be strengths and weaknesses of the program?

Delimitations

This study had the following delimitations:

1. Only African American participants recruited through churches in Houston/Harris County and surrounding areas participated.
2. Only African American participants age 18 years and older participated.
3. Only African American participants who could read, write, and speak English participated.

Limitations

This study had the following limitations:

1. The volunteer sample only included African Americans living in Houston/Harris County and surrounding areas. Program outcomes cannot be generalized to the entire African American U.S. population.
2. ProjectPower program outcomes cannot be generalized to one particular church denomination.
3. The diabetes education program is designed by the ADA for African Americans. Program outcomes cannot be generalized to all ethnic groups.
4. This study did not control for the threats of history or the school bus effect, which may impact post-test results.

Assumptions

In this study, the following assumptions were made:

1. Participants will complete all instruments to the best of their knowledge.
2. Participants will be able to read, write, and comprehend English.

Definition of Terms

Below are definitions of terms that were used in this study:

African American—In the federal government, the category “Black or African American” refers to people having origins in any of the Black racial groups of Africa. It includes people who indicated their race or races as “Black, African American or Negro,” or wrote in entries such as African American, Afro American, Nigerian, or Haitian. (USCB, 2007, p.1)

Diabetes—“Diabetes is a disease in which the body does not produce or properly use insulin. Insulin is a hormone that is needed to convert sugar, starches, and other food into energy needed for daily life” (ADA, n.d.d, ¶ 1). In type 1 diabetes, the body fails to produce insulin. In type 2 diabetes, the body becomes insulin resistant and does not properly use insulin (ADA).

Ecological Model — A model that addresses both behavior and its individual and environmental determinants (McLeroy, Bibeau, Steckler, & Glanz, 1988).

Empowerment Theory—“The ability of individuals to gain control socially, politically, economically and psychologically through access to information, knowledge and skills, decision-making, individual self-efficacy, community participation and perceived control” (Zimmerman, 1988, as cited in Harris & Veinot, 2004, p. 3).

ProjectPower—An African American diabetes awareness program developed by the ADA (ADA, n.d.c).

Transtheoretical Model and Stages of Change—According to this model, behavior change involving a troubled behavior involves individuals proceeding through six distinct stages: (a) precontemplation (not thinking about making changes within the next 6 months); (b) contemplation (thinking about making changes in 6 months); (c) preparation (intending to take action within the immediate future); (d) action (behavior has changed within the past 6 months); and (e) maintenance (working to sustain the change after the past 6 months; (f) termination (100% self-efficacy) (Velicer, Prochaska, DiClemente, & Brandenburg, 1985).

Significance of the Study

A gap in research exists between linking knowledge, readiness to change, and empowerment in African Americans. This study added to the knowledge-base by exploring these variables further and determining if a diabetes church-based program such as ProjectPower could impact Houston/Harris County, Texas African Americans' knowledge, readiness to change, and feelings of empowerment. Finally, by using the Transtheoretical and Ecological Models as the foundation for this research, health educators can develop or refine culturally competent diabetes education programs for African Americans that use theory to address factors that impede or promote diabetes treatment and prevention outcomes among this group.

CHAPTER II

LITERATURE REVIEW

The purpose of this chapter is to present a review of the literature that is relevant to this study. Current research regarding African Americans and type 2 diabetes is outlined, including health education and faith-based programs. In addition, theories that have been applied to African Americans and type 2 diabetes research are also discussed.

Prevalence of Type 2 Diabetes

According to the Centers for Disease Control and Prevention (CDC; 2008a), 24 million people have been diagnosed with diabetes in the United States, which reflects an increase of about 3 million within the past two years. Along with this prevalence data, the CDC also reported that diabetes is the seventh leading cause of death in the country (CDC). Not surprisingly, diabetes is also a leading killer in Texas. The Texas Diabetes Council (TDC) reported that diabetes was the sixth leading cause of death in Texas from 2002 through 2005 (TDC, 2008). The Texas Diabetes Fact Sheet showed that there are 1.8 million people over the age of 18 years with diabetes (TDC). In 2007, 853,751 or 9.9% of men and 942,698 or 10.8% of women in Texas were diagnosed with diabetes (TDC).

African Americans are disproportionately affected by diabetes. Approximately 3.7 million African Americans older than 20 years have diabetes, and 95% of these cases are type 2 (ADA, n.d.a; CDC, 2008b). "Twenty-five percent of African Americans

between the ages of 65 and 74 and 1 in 4 African American women over the age of 55 have diabetes” (ADA, n.d.a, ¶ 1). Furthermore, African Americans are 1.8 times more likely to have diabetes than non-Hispanic whites; and, among people with diabetes, African Americans are 1.5 to 2.5 times more likely than other ethnic or racial groups to suffer from lower limb amputation (ADA, n.d.a). In Texas, African Americans had the highest prevalence of diabetes with 244,590 individuals affected, which accounted for 12.9% of the total diabetic population (TDC, 2008). The age groups with the highest diabetes prevalence were 45-64 years of age (14.5%) and 65 years and older (23.2%). African Americans over 65 years of age showed the highest prevalence rate (36.5%) compared to all other racial groups (TDC).

This high prevalence of diabetes among African Americans is alarming, particularly considering the expected growth of the African American population in coming years. In 2006, the USCB estimated that there are approximately 37 million African Americans in the U.S. compared to 35 million in 2000. This population is expected to increase to 50 million by the year 2030 (USCB, 2006). Texas is one of 10 U.S. states that reports the largest number of African Americans. Furthermore, of the 10 largest cities in the U.S., Houston ranked 5th of all cities with the largest proportion of African American population (USCB, 2004). Because of the large population of African Americans, Houston was selected by the ADA as one of the cities to implement an African American Initiative Program to raise awareness about diabetes.

Epidemiology and Complications

Diabetes is a serious and debilitating disease. It is the major cause of debilitating complications such as blindness, nerve damage and amputations (ADA, n.d.d; Peek, Cargill, & Huang, 2007). Diabetes can be prevented and maintained by using a combination of lifestyle changes and medications (Baptiste-Roberts et al., 2007; Tull & Roseman, n.d.; Winer & Sower, 2004). Because diabetes lifestyle changes and self-care are often complicated and difficult to maintain, diabetes is one of the most “behaviorally demanding chronic illnesses” (Amoako, Skelly, & Rossen, 2008, p. 2).

Risks

Although diabetes is more common in African Americans, the health risks associated with diabetes are the same in African Americans as in any other racial group (ADA, 2008a). However, African American women are at increased risk for poor health outcomes because they are often the sole source of financial support for their families and live in economically challenged and medically underserved areas (Giger, Appel, Davidhizar, & Davis, 2008). Amoako et al. (2008) stated that poor health outcomes in African American women are a result of their inability to understand the uncertainty surrounding the “lack of information about self-care activities, a complexity of self-care activities, comorbid conditions, and a lack of resources” (p. 1). African American men are at increased risk for poor health outcomes because of a lack of health information (Thompson, Talley, Caito, & Kreuter, 2007), “lack of consistent health care” (Jack, Toston, Jack, & Sims, 2008, p. 3), and fear of exercising in their neighborhoods (Hendricks & Hendricks, 2000).

Other risk factors for diabetes include having a family history of diabetes, obesity or overweight, age of 45 years or older, high blood pressure, gestational diabetes, abnormal cholesterol (lipid) levels, and physical inactivity. In addition, individuals who “have polycystic ovary syndrome (PCOS), have blood vessel problems affecting the heart, brain or legs, have dark, thick and velvety patches of skin around the neck and armpits” are also at risk (Diabetes Prevention Program, 2008, p. 2).

Symptoms

The ADA lists seven symptoms for diagnosing diabetes: “frequent urination, excessive thirst, extreme hunger, unusual weight loss, increased fatigue, irritability, and blurry vision” (Clark, Fox & Grandy, 2007, p. 3). Additional symptoms identified by the International Diabetes Federation (n.d.) include slow-healing wounds and recurrent infections. Although there are accurate diagnostic tests available, providing these screening test to the right people in a timely manner is a challenge. Clark et al, conducted a five-year observational study of individuals at risk for diabetes. The sample included those with type 1 or type 2 diabetes, as well as those at risk for diabetes. Participants completing an initial screening were mailed a follow-up questionnaire. Being at risk was determined by having three to five of the identified risk factors, which included frequent urination, increased fatigue, irritability, excessive thirst, blurry vision, extreme hunger, unusual weight loss, erectile/sexual dysfunction, shortness of breath, and chest pressure, discomfort, or pain. The results helped identify those who should be examined or evaluated for type 2 diabetes. These findings also helped improve “early evaluation and management of risk factors leading to diabetes” (Clark et al., p. 3).

Financial Impact

The increase in the prevalence of diabetes has serious financial implications associated with the costs of caring for diabetes-related illnesses and complications. In 2002, diabetes-related costs were \$132 billion, with \$92 billion in direct medical costs and \$40 billion in indirect costs (U.S. Department of Health and Human Services [DHHS] Office of Disease Prevention and Promotion, 2006). In a study conducted by the ADA (2008b), the total estimated cost of diabetes increased to \$174 billion in 2007 with hospital care being 50% of these costs. This study also estimated that nationally, the cost of productivity lost due to absenteeism was \$58.2 billion. The male population between the ages of 45-54 showed the highest per capita loss from absenteeism (ADA).

Diabetes and Healthy People 2010

The DHHS has outlined 17 diabetes-related objectives aimed at improving diabetes diagnosis and care nationally. The first objective is to “increase the proportion of persons with diabetes who receive formal diabetes education” from 48% in 1998 to 60% in 2010 (DHHS, n.d., p.9). Texas data showed an increase in diabetes education for African Americans from 62% in 2001 to 70% in 2003, but this had decreased to 45% by 2004 (CDC, 2008c).

A national task force that included members from the American Association of Diabetes Educators, the ADA, the CDC and other organizations, federal agencies and federally funded programs have developed national standards for conducting diabetes education. The standards are based on behavioral terms instead of the traditional method of gaining knowledge. The standards were developed to guide the educator through the

delivery of health education programs that can be implemented in diverse settings (Funnell et al., 2007; Mensing et al., 2007).

Rickheim, Weaver, Flader, and Kendall (2002) examined the delivery of diabetes education in a group setting as opposed to an individual setting and found that group sessions proved to be more effective in achieving learning outcomes than the individual sessions. Moreover, those participating in the group sessions showed a greater decrease in blood glucose levels as opposed to those participating in individual sessions. The researchers postulated that group participation could have financial benefits, but further research is needed to test this hypothesis. “The movement to group-based education was supported by the Balanced Budget Act of 1997, and it resulted in uniform reimbursement for diabetes education from the Health Care Finance Administration (HCFA)” (Rickheim et al., 2002, p. 269). Further research is needed to examine outcomes of group-based diabetes education in diverse settings.

Health Education

There is a great need to provide health education to the African American community (e.g. Jackson 1924; Airhihenbuwa & Liburd, 2006). Airhihenbuwa and Liburd also described the need to eliminate health disparities in the African American population. University, public health and church-based partnerships can work together to help reduce these disparities by providing health education in African American communities (Airhihenbuwa & Liburd). In order for a church-based health education program to be successful, specifically those under examination for research, the program has to be accepted and supported by the pastor of the church. Ammerman et al. (2003)

stated that “including African Americans in research has become an important challenge faced by investigators hoping to address health disparities in health” (p. 1720) because of past and present issues of distrust.

Use of Church-based Programs

The African American church could be pivotal in optimizing health status among African Americans (Giger et al., 2008). Boltri et al. (2006) reported that “African American churches are proven venues for screening and risk factor reduction in cancer and cardiovascular disease” (p. 902). The reason diabetes risk factor reduction has not been focused on may be because of the lack of awareness about the need to promote diabetes awareness and prevention education in the church (Boltri et al.). In a previous review of the literature, studies showed that church-based health programs are effective for diabetes education (Ammerman et al., 2002; Anderson-Loftin et al., 2005; Dutton, Johnson, Whitehead, Bodenlos, & Brandtley, 2005; Engelgau et al., 1998).

Pastor and Member Views

The church can play a major role in assisting to provide health care services to the community and provide researchers with entry into the African American community (Giger et al., 2008). When implementing programs, it is important to get the pastor to give his blessing of the programs from the pulpit in order for the programs to be successful (Peregrin, 2006). Boltri et al. (2006) conducted a focus group to determine how church members and pastors felt about health education and promotion, as well as the barriers and resources for program implementation. “Church members were used as consultants and partners in assessing the problem of how to best implement a church-

based diabetes prevention program” (Boltri et al., p. 902). Twenty-two participants were recruited using snowball sampling. Four focus groups were held with five to six participants in each group. The results showed that the barriers included: lack of knowledge of programs in church, lack of knowledge of risk, lack of interest, and maintaining attendance throughout the program (Boltri et al.). Other barriers identified by Cantanzaro, Meador, Koenig, Kuchibhatia, and Clipp (2007) included liability concerns and financial resources.

In the PRAISE Project, views regarding health education research were solicited from 78 pastors and lay church leaders by telephone and self-administered print surveys. Follow-up interviews were held with 4 pastors. (Ammerman et al., 2003). The results showed that pastors were less certain that their congregations wanted to participate. Both pastors and lay leaders were more concerned about “keeping paperwork to a minimum and receiving adequate funding from the university for research tasks” (p. 1723). They were also concerned about honest communication between researchers and the congregation and about seeing the results from the study (Ammerman et al.)

Impact of Tuskegee

Establishing trust has been identified as a major concern for researchers and participants (Burrus, Liburd, & Burroughs, 1998; Carter-Edwards, Fisher, Vaughn, & Svetkey, 2002). When earning the trust that pastors and members expect, researchers must not assume that the nature of this distrust stems from the errors made in previous research studies such as the Tuskegee Study where researchers abused human subjects. The trust that is needed could be based on information received from fiction, mass media,

music or documentary studies (Freimuth et al., 2001). Another barrier that may be present is the participants, lack of understanding about research. One common theme noted in a study conducted by Freimuth et al. (2001) was the statement “humans can be guinea pigs as well,” which illustrated a theme of suspicion. Participants noted that they were more likely to participate in research that involved survey completion, but criticized research focusing on individual behaviors because of the possible implication that African Americans were the primary cause of their health problems. On the otherhand, in a comprehensive review of the literature by Wendler et al. (2006), the results showed overall small differences in African American’s willingness to participate in health research compared to non-Hispanic whites.

Culturally Competent Research with African Americans

Although the church is an effective venue for conducting health education programs, researchers must be mindful of the beliefs of church members. For greater maximization, patient education must be culturally sensitive (Oomen, Owen, & Suggs, 1999). King, Burgess, Akinyela, Counts-Spriggs, and Parker (2005) examined three generations of African Americans to compare family-level religion and health beliefs. The results of the study showed that “families affirm God’s sovereignty over their health by spiritualizing, rather than ‘medicalizing,’ their health beliefs” (King et al., p. 420). Participants stated that occasionally they relied on God to help them engage in more health-promoting behaviors, such as eating healthier foods and exercising more.

Ecological Model

Missing from the emerging research are studies that focus on health education conducted in diverse settings, such as religious venues, and research involving African Americans that focuses on the social dimensions of religion and health, specifically within the family context as guided by theoretical models. A model that addresses both behavior and its individual and environmental determinants is the Ecological Model proposed by Urie Brofenbrenner (McLeroy, Bibeau, Steckler, & Glanz, 1988). In his original model, Brofenbrenner proposed a reciprocal causation where people are both affected by and affecting multiple levels of influence. He describes those levels as the microsystem (interpersonal), the mesosystem (interpersonal), exosystem and the macrosystem (McLeroy et al., 1988). A variation of this model addressed the intrapersonal, interpersonal, organizational, community and public policy levels of influence (McLeroy et al.).

Intrapersonal Influencers

In the Ecological Model, intrapersonal influences include goal setting (Fisher et al., 2005), a person's knowledge, attitudes, beliefs and personality traits (Robinson, 2008), genetic heritage and personality dispositions (Stokols, 1996), and culturally specific health care patterns (Hughs, Love, Peabody, & Karding-Edgren, 2001). Wenzel, Ulz, Steeves, Hinton, and Jones (2005) studied intrapersonal influences by conducting a qualitative study with seven participants to determine their views on barriers to diabetes self-care. One of the common themes noted from their focus group was that being diagnosed with diabetes was emotional, and participants (especially men) felt that being

diagnosed was a “physical betrayal by the body” (Wenzel et al., p. 102). Therefore, being emotional can be considered as an intrapersonal influencer as described by the Ecological Model.

Interpersonal Influencers

Interpersonal influences are described by Robinson (2008) as those that provide social support, such as family, friends and peers. In diabetes self-management, it is important to include those who are also affected by the disease, such as family and friends (Jones et al., 2008). Jones et al. examined the impact of family and friends on those with diabetes and their willingness to be involved in a diabetes program. Using a qualitative research design, the results showed that participants thought friends and family were generally supportive, but often created more challenges. Challenges created included working and being a full-time mom, maintaining a healthy diet while living in the house with junk food junkies and providing health care for family members. Family and friends who participated stated that they were not aware that they were making the participants’ diabetes management more challenging (Jones et al.).

Community Influencers

Community influencers that may serve as barriers to individual diabetes self-care management include lack of attractive places to exercise (Fisher et al., 2005), lack of transportation (McNabb, Quinn, & Tobian, 1997), and crime and lack of access to certain resources (Gary et al., 2008). According to Giger et al. (2008), the African American church is the center of the African American community and can be defined as

organizational involvement. The church is also viewed as a place where people can be trusted and a place where social support is received (Giger et al., p. 375).

According to Jack, Liburd, Vinicor, Brody, and Murry (1999), there are many factors in the environment that affect human experiences:

The concept of environment deals with the cumulative effect of human experiences with situations such as housing conditions, racism, occupational hazards, employment status, availability of quality health care, availability of health care coverage, family and social network, support, community violence, and acculturation (p. 777)...with further research, we may find that external conditions resulting from the environmental context constrain individuals' responses to those conditions, which would help explain the difficulties that individuals with diabetes experience when they try to adopt and maintain self-management skills. (p. 779)

In a focus group conducted by Massaro and Clalborne (2001), participants identified access to healthcare services and healthcare professionals as barriers to improving diabetes care. To overcome these barriers, researchers targeted healthcare facilities to assess availability of services, distribute free educational material and assist in conducting screenings. Steps were also taken to overcome negative perceptions of healthcare systems that included "focusing on knowledge deficits and negative perceptions" (Massaro & Clalborne, p. 825).

Anderson (1998) reflected on his early experiences with African Americans. When chosen to lead diabetes care efforts for African Americans as a healthcare

professional for the University of Michigan, Anderson often wondered if he could be considered racist because of the different feelings that he felt when being around African Americans for the first time. Through his desire to overcome racism and to embrace different cultural beliefs, Anderson became a well-known and successful leader in diabetes care and research in the African American community (Anderson). Anderson's success with diabetes education shows that those not of the African race can successfully promote health in the African American community.

The United Way of Greater Houston conducted a needs assessment in 2008 and found that a weather-related disaster can make a difference in many of the environmental influences that affect people (United Way of Greater Houston, 2008). The results showed that after Hurricane Ike: 61% stated that their employment was interrupted because businesses were not operating; 14% were affected by lack of transportation; 8% were affected by lack of childcare; and 17% affected by job loss. Post Hurricane Ike, 63% stated that food was a critical need, 44% needed financial assistance, 24% housing and 11% healthcare (United Way of Greater Houston, 2008). The damage from the storm was so devastating that the entire city of Houston was in the dark the night of the storm. After the storm, 16% of the residents suffered major home damage, 42% had damage, but their home were livable and 42% had minor home damage (United Way of Greater Houston, 2008). Houston's unemployment claims also increased 294% in September 2008. In addition, people experienced stress, which affected coping skills and emotional health. As a result, the United Way developed plans to help secure the community's social safety net (United Way of Greater Houston).

Policy Influencers

The Ecological Model also takes into consideration “health promotive policies,” public education, and screening and health guidelines established by community and governmental organizations (Stokols, 1992, p. 15). Policies can include the setting of guidelines, such as the food pyramid designed by the U. S. Department of Agriculture, and the diabetic food pyramid, specifically designed by the ADA for people with diabetes. Policies can also include the setting of guidelines, such as those established by the CDC for appropriate levels of exercise, and those created by ADA for appropriate levels of physical activity for those with diabetes (Stokols).

With this in mind, Bauer et al. (2003) described the policy level influencers as a system that could be used in health promotion and prevention planning and implementation. In this model, health promoting policies can be developed at the local, national or international level. They described these influencers as action areas or a “classification system for health promotion” (Bauer et al., p. 107). They further explained about “implementing health promoting policies and how the political environment, the organizations developing and enforcing the policy, the community organizing to advocate policy development and the capacities of persons to organize and lobby, all have an influence on the policy making process”(Bauer et al., p. 113).

Dietary Patterns and the Ecological Model

When applying the Ecological Model to dietary patterns, Robinson (2008) described the intrapersonal level as a person’s “taste preferences, habits and nutritional knowledge and skills, interpersonal level/social environment (process whereby culture,

social traditions, and role expectations impact eating practices; and patterns within peer groups, friends and family)” (p. 395). Organizational, community and public policy levels are other environmental factors that affect food access and availability (Robinson). Hargreaves, Schlundt, and Buchowski (2002) learned from a focus group of 40 African American women that environmental factors, such as “access to fast food, vending machines, food stores that are open at all hours every day, take-out, microwave ovens, affordable restaurants and well stocked grocery stores had an effect on eating habits” (p. 141). As Airhihenbuwa et al. (1996) observed, “changes in food availability will need to take place before or parallel to individual changes” (p. 245).

Exercise and the Ecological Model

Fluery and Lee (2006) applied the Ecological Model to physical activity among African American women. In a review of the literature, Fluery and Lee (2006) identified “perceptions of the benefits of physical activity as well as level of motivation and commitment as being central to the initiation and maintenance of physical activity” (p. 135) on the intrapersonal level. The data revealed a need to develop programs that are equivalent to participants’ resources and skill levels. The interpersonal level of influences included those associated with social support and social norms. Support from family and friends were major influencers, while lack of day care and household responsibilities were seen as hindrances. The major environmental influence on the community level was safety. Organizational influences included affordable partnerships, such as those at work, church or other organizational mechanisms (Fluery & Lee).

However, Dutton et al. (2005) reported that based on the results of their research, major factors affecting lack of exercise in those with diabetes were health related instead of environmental. One hundred and five adult patients with type 2 diabetes participated in this study, which assessed 35 barriers to physical activity. The results showed that “barriers were not significantly related to participants’ belief that exercise could prevent future diabetes complications” (p. 1209). Those barriers included “lack of time, social support and equipment, as well as medical and physical barriers to activity” (p. 1209). Other barriers included “bad weather, special occasions and lack of physician advice” (Dutton et al., p. 1209).

Project Power

The ADA provides health information through community-based and faith-based programs designed to promote diabetes prevention and to maintain diabetes self-care in order to avoid severe complications. The goals of the Houston area program, which are extracted from the national goals, are to “establish collaborations to more effectively reach the community with our messages and materials and to build trust with the community and to develop qualitative assessments that provide a true measure of existing programs and guide development of future programs” (ADA, n.d.e, ¶ 2).

The ADA has created a year-round diabetes awareness program called ProjectPower, which is specifically designed for implementation in African American churches. In this program, the church can promote awareness messages and healthy family living by participating in a four-module course: (a) Diabetes Day & Power Over

Diabetes, (b) O Taste and See, (c) Fit for the Master's Use and (d) Clean Heart (ADA. n.d.c).

Module 1 – Diabetes Day & Power Over Diabetes (Introduction to Diabetes)

In this first module, risk factors, the importance of good diabetes care and basic diabetes knowledge are introduced. The module discusses why it is important for the church family to learn about diabetes. It introduces the Bible verse “My people are destroyed for a lack of knowledge...” (Hosea 4:6, King James Version).

African Americans are not only disproportionately affected by diabetes, but they have also shown a lack of knowledge about the risks associated with diabetes and about the availability of prevention programs conducted in churches (Boltri et al., 2006; Anderson et al., 1996). Indeed, Strine et al. (2005) reported that “50% to 80% of persons with diabetes have significant deficits in knowledge pertaining to the management of their disease” (p. 79).

Skelly et al. (2006) examined a sample of 51 African Americans regarding their beliefs about diabetes using “Klienman's explanatory model of illness” as the framework (p. 9). After analyzing common themes, the results showed that exercise was not perceived by the participants as a method of preventing diabetes. Participants also showed symptoms of stress, anxiety, and depression. Because participants in this study believed diabetes could not be prevented, these results are the basis for the implementation of prevention efforts specifically in at-risk groups (Skelly et al.)

According to Schorling and Saunders (2000), those participating in a focus group experienced higher glucose levels if they felt that their condition was “sugar,” a less

serious condition than diabetes (Schorling & Saunders, 2000, as cited in Rivers & Rowell, 2007). The results of a survey on engaging in physical activity showed an increase of 8%, but also showed disparities in the results. Non-Hispanic whites showed a higher prevalence of physical activity than non-Hispanic blacks (CDC, 2007). As part of the Alliance of Black Churches Health Project, Schorling and Saunders (2000) conducted a study to “determine if differing beliefs about high blood glucose exist and are associated with blood glucose control among rural African Americans” (p. 330). One thousand thirty-one subjects responded to a survey asking if they had ever been told by a doctor that they have diabetes or sugar diabetes. The second phase of the study included a screening of body mass index (BMI) and a blood test that checked the amount of sugar called glycohemoglobin (GHb) of 403 participants. Those participating in the screening were also asked if they had ever been told by a doctor that they have diabetes or sugar diabetes. A total of 103 respondents, or 10%, answered “yes” on the first survey; and a total of 56, or 13.99%, answered “yes” during the second phase. During the second phase, 56 participants answered “yes” that that they currently had diabetes. “Overall, 36 said they had diabetes, 16 sugar, and 4 sugar-diabetes” (Schorling & Saunders, p. 331).

It is very important that self management of diabetes include knowing one’s hemoglobin (Hb) A1C (HA1c) levels. Heisler, Piette, Spencer, Kieffer, and Vijan (2005) conducted a study examining “whether knowing one’s HbA1c value is associated with a more accurate assessment of diabetes control and better diabetes self-care understanding, self-efficacy, and behaviors related to glycemic control” (p. 816). In this cross-sectional survey, a sample of 686 U.S. adults with type 2 diabetes was examined. The results

showed that “66% of the respondents reported that they did not know their last HbA1c value and 25% accurately reported the value” (Heisler et al., p. 816).

In addition, healthy eating is known to reduce blood sugar levels. Ziemer et al. (2003) conducted a study with 648 African American patients with type 2 diabetes. They found medical nutrition therapy to be effective in reducing blood sugar levels when comparing a simple meal plan to a traditional exchange-based meal plan. The results showed that medical nutrition therapy is effective by “providing either a meal plan emphasizing guidelines for healthy food choices or a low literacy exchange method meal planning approach” (Ziemer et al., p. 1719).

Module 2 – O Taste and See (Healthy Eating)

The purpose of this module is to increase awareness about the importance of healthy eating and how to identify, prepare, and cook healthy foods, particularly those foods low in fat and high in fiber. This module also describes how to eat in smaller portions and provides a diagram of what foods a plate should contain.

Culturally Competent/Diet

African Americans are known to have diets that are high in fat and low in fiber (Airhihenbuwa et al., 1996; Hargreaves, Schlundt, & Buchowski, 2002). According to Kwate (2008), African American neighborhoods are exposed to more fast food restaurants than other neighborhoods. Fast foods are low in nutrients and high in calories, fat and cholesterol and primarily include fried chicken, hot dogs, and hamburgers (Kwate). Satia, Galanko, and Siega-Riz (2004) conducted a study among African Americans examining the behaviors associated with eating at fast food

restaurants. Self-reported data from 658 surveys showed that 76 percent of the respondents had eaten at fast-food restaurants during the previous three months. They found a positive association between eating at fast-food restaurants and total fat, saturated fat intakes and lower vegetable intakes (Satia et al.).

Watters, Satie, and Galanko (2007) conducted a study to examine the psychosocial factors associated with consumption of fruits and vegetables, which is associated with lower risks of obesity. They surveyed 658 African Americans in North Carolina and collected data using the PRECEED (Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation) framework. The mean age of participants was 43.9 years. Women showed higher intakes of fruits and vegetables and higher responses to psychosocial factors than men.

According to Song, Manson, Buring, and Liu (2004), the consumption of red meat has been associated with the risk of type 2 diabetes. Song et al. evaluated 37,309 participants over 8.8 years in the Women's Health Study using a self-report survey on diet consumption. The results showed that women who consumed high amounts of red meat were at risk for type 2 diabetes. Song et al. stated that "red meats are a major source for saturated fat, cholesterol, animal protein, and heme iron" and that "red meat also contains toxins that are harmful to the pancreatic B-cell" (p. 2112).

Finally, Palmer et al. (2008) conducted a prospective study using data from the Black Women's Health Study that was collected between 1995 and 2005. The researchers examined the effects of sugar-sweetened beverages on the incidence of type 2 diabetes in African American women. In their literature review of the effects of sugar

sweetened beverages, Palmer et al. found that sugar-sweetened drinks were associated with type 2 diabetes in two other studies (Montonen et al., 2007, as cited in Palmer et al., 2008; Schulze et al., 2004, as cited in Palmer et al., 2008) and not associated in another (Paynter et al., 2006, as cited in Palmer et al., 2008). Studies examining the association between African American women and sugar-sweetened drinks were not found. They did not find studies that looked at an association between African American women. In a prospective study of 59,000 African American women, incidents of diabetes were positively associated with consumption of sugar-sweetened soft drinks. Women who consumed two or more soft drinks per day showed a 24% increase in diabetes compared to those who drank one or less per day. Those who consumed two or more sweetened fruit drinks showed a 31% increase compared to those who drank one or less per day.

Unlike foods that have an effect on type 2 diabetes, coffee consumption has been linked to a reduction in the risk of type 2 diabetes (Hu, Jousilahti, Peltonen, Bidel, & Tuomilehto, 2006; Smith, Wingard, Smith, Kritz-Silverstein, & Barrett-Conner 2006; VanDam, Willett, Manson, & Hu, 2006). Hu et al. conducted studies that included Finnish men and women and found that “a reduction in type 2 diabetes existed between men and women regardless of their BMI and level of activity” (p. 1742). Smith et al. conducted studies that included adults over 50 with impaired glucose. Their studies confirmed the existence of “the protective effect of caffeinated coffee against diabetes” (p. 2385). VanDam et al. conducted studies that included younger and middle-aged U.S. women. The findings from this study revealed that “moderate consumptions of both

caffeinated and decaffeinated coffee may lower risk of type 2 diabetes in younger and middle-aged women” (p. 398).

Focus Groups: African Americans' Perceptions about Diet

To explore African Americans' perceptions about diet, Anderson et al. (1996) conducted focus groups to determine the top two psychosocial issues that were related to healthy eating and diet. Participants stated that the successful integration of diet into their lifestyle was an issue and that the importance of cultural traditions made it hard to change eating patterns. Blanchard, Rose, Taylor, McEntee, and Latchaw (1999) conducted similar focus groups and found that participants felt that they were powerless to control their food consumption and “felt frustrated about dietary restrictions” (p. 920).

Results from African Americans' Participation in Diet Studies

Ammerman et al. (2002) conducted a randomized trial in African American churches to identify barriers and motivators to dietary change. In the PRAISE Project, churches were randomized by county to the intervention group (Group 1) or to the delayed intervention control group (Group 2). Results from focus groups showed that participants were aware of ways to improve healthy eating, but felt that others would not enjoy the taste of their cooking. Cultural habits also played a role in the preparation of meals and eating habits (Ammerman et al.).

In their study called “Soul Food Light,” Anderson-Loftin et al. (2005) also examined a dietary intervention among African Americans. A total of 98 participants were randomly assigned to an experimental or control group. The intervention included a four-week class on low-fat dietary strategies, five-month peer-professional group

discussions and weekly telephone follow-up. The experimental group lost an average of 4 pounds compared to an increase of 4.2 pounds for the control group.

Results from these studies showed that African Americans are aware of their eating habits. The results also showed that they are willing to work on correcting negative habits and will participate in programs conducted by churches to correct those habits. However, eating habits are not all that require self-maintenance for controlling diabetes. Exercise is also an important part of controlling diabetes and is why the ADA includes “Fit for the Master’s Use” into the ProjectPower program.

Module 3 – Fit for the Master’s Use (Physical Activity)

In this module, participants learn the definitions of diabetes and pre-diabetes. This module increases awareness of why physical activity is important, introduces different forms of exercise, provides suggestions for getting started, and increases awareness of the healthcare provider’s role.

What are African Americans’ Perceptions about Physical Activity?

Engelgau et al. (1998) conducted the first comprehensive community diabetes demonstration project in the United States in an African American community. It was called Project DIRECT (Diabetes Interventions Reaching and Educating Communities Together) and was conducted by the Centers for Disease Control and Prevention and the state of North Carolina. Researchers surveyed 1475 of 1884 sampled households and found that 52% of the African American population in the community was physically inactive and 51% were overweight (Engelgau et al.).

White, Drechesel, and Johnson (2006) examined a faith-based physical activity (PA) program for African Americans conducted through an African American church. White et al. recruited 44 participants from the African Methodist Episcopal (AME) churches, including 24 men and 20 women. Four focus groups were conducted for each gender group to examine the “perceived influences on physical activity participation, the perceived link between spirituality and health behaviors and the perceived role of the church in promoting PA among African American men and women church members” (White et al., p. 816). The results of the focus group provided insight into the development of a faith-based exercise program by defining the types of programs that members were willing to participate in.

African American Participation in Physical Activity Studies Related to Diabetes

In a study focusing on African American participation, Kim et al. (2008) conducted an 8-week “behaviorally focused weight-loss program known as the WORD (Wholeness, Oneness, Righteousness, Deliverance), in which participants met once a week for two hours in WORD groups (8 to 10 people) led by a pair of trained community members known as WORD Leaders (or lay health leaders)” (p. 637). Discussions were held about the importance of health eating, exercising and the faith and health connection. The intervention called for church leaders to lead focus groups with members from their respective churches. Researchers found a significant amount of weight loss between a control group and treatment group at eight-week follow-up compared to baseline. The participation results were low compared to other weight loss interventions mainly because of the short length of time used to conduct the study.

Health Education Theories and Diabetes

Empowerment

All three modules of the ProjectPower program are based on the concept that God's people are not powerless against diabetes and link this concept with the Bible verse "God hath not given us the spirit of fear; but of power, and love and of a sound mind" (2 Timothy 1:7, King James Version). Few studies have included measures of empowerment as it relates to program participants' readiness to change. The activities regarding appropriate blood levels, healthy eating and physical activity built into the ProjectPower modules are designed to empower individuals and to promote readiness to change. Goal-setting activities built into the program are also designed to empower participants and increase readiness to change.

According to Davis, Vander Meer, Yarborough, and Roth (1999), "patient education is based upon the view that maximal progress is achieved when an individual is enabled (empowered) to select options to reach outcomes that the patient generates and endorses" (p. 249). Empowering the individual to make personal adjustments is a critical component in health education (Blanchard et al., 1999).

The concept of empowerment is appearing with increased frequency in discussions of prevention generally and diabetes self-management specifically. For example, Anderson et al. (2005) conducted a study to "evaluate the impact of a problem-based empowerment patient education program specifically tailored for urban African Americans with type 2 diabetes" (p. 671). They used a pre/post repeated measures design randomly assigning patients to a six-week intervention or wait list for the control

group. Follow-up included a monthly support group or a monthly phone call for six sessions. Assessment measures were also collected. Participants showed “small-to-modest” changes in psychosocial during the six weeks (Anderson et al., p. 671). The study conditions were maintained after one-year follow-up. When working with patients on behavior change modification, Anderson and Funnell (2005) suggested that patients personalize their plans by addressing five areas: identify the problem or desired behavior change, explore feelings, set goals, make a plan and evaluate the results.

Stages of Change

Many different studies have explored the stages that people go through when they are trying to change health behaviors. The Transtheoretical Model (TTM) or Stages of Change proposes that behavior change is not linear, and that people move from stage to stage when making decisions to change (Prochaska & DiClemente, 1982). Chronic behaviors such as are not changed by patients taking immediate action. Rather, these behaviors, in particular, are changed in stages (Prochaska & DiClemente, 1982; Prochaska & Prochaska, 1999; Velicer et al., 1985). These stages include precontemplation (not thinking about making changes within the next 6 months), contemplation (thinking about making changes in 6 months), preparation (intending to take action within the immediate future), action (behavior has changed within the past 6 months) and maintenance (working to sustain the change after the past 6 months; Prochaska, Norcross, & Diclemente, 1994; Prochaska & Prochaska; Velicer et al.). Prochaska et al. (1994) also included the termination stage (100% self-efficacy), but acknowledged that not all problems can be terminated and may require maintenance with

age. The Stages of Change are appropriate for research involving empowerment through education and social support because individuals may be more apt to move along a continuum of change in order to make long-term, behavioral changes that would ultimately improve their diabetes care (Prochaska et al.).

Lach, Everard, Highstein, and Brownson (2004) described the TTM as “a practical theory for health education programs,” (p. 93) and went on to write that the TTM “has been found to be useful in application to health education with older adults for program planning, curriculum development and program evaluation” (p. 93). Using this model, Lach et al. created a grid to guide their assessment of older adults participating in the Health Stages program. This grid included each stage of the TTM along with the class level appropriate for participants. By providing knowledge interventions, the program helped people in the contemplation and preparation stages to “change their attitudes or learn what they needed to know to make successful changes” (p. 90). After attending lectures, participants were also expected to move into the action stage by joining an exercise class (Lach et al.).

Parchman, Arambula-Solomon, Noel, Larme, and Pugh (2003) examined the amount time it takes for people to advance from one stage to another. The results from their study showed that “duration with diabetes was significantly associated with advancement in stage of change for diet and exercise but not for self-monitoring of blood glucose (SMBG)” (p. 131). Those who were diagnosed with diabetes within one year were more likely to advance in the stages of change for diet and exercise, but not for SMBG. They were also more likely to advance in the stages of change than those who

were diagnosed more than two years prior to enrollment. Parchman et al. created an algorithm for exercise stages of change by asking participants if they exercised. Those responding that they did were then asked how long they had been exercising. If the time period was less than six months, they were placed in the action stage; and if the time period was more than six months, they were placed in the maintenance stage. When asking participants if they planned to exercise, based on a yes/no answer, they were placed in precontemplation, preparation or contemplation stages (Parchman et al.).

Highstein, O'Toole, Shetty, Brownson, and Fisher (2007) described three studies that have been implemented using the TTM. They stated that it is hard to tailor interventions to individuals because they may vary in their readiness to change. A person may be in one stage of change for physical activity and in another stage for dietary patterns. In each of these three studies, participants placed themselves in the stage of behavior by completing a questionnaire. (Highstein et al.).

Walcott-McQuigg and Prochaska (2001) examined the stages that elderly African American participants move through when deciding to engage in physical activity. Using the Motivational Readiness to Exercise screening instrument, participants were measured on three of the stages of change constructs that included (a) non-exercisers with no intention to exercise in the next 6 months (precontemplation), (b) those who were considering participating in an exercise program in the next 6 months (contemplation), and (c) current exercisers who were participating in an exercise program (action/maintenance). The results showed participant responses to measures varied by

stage and gender. The participants suggested ways to recruit senior African Americans and ways to retain them in exercise activities.

Other Participation in ProjectPower

Published documents showed that the ProjectPower program has been implemented in different cities, but has been evaluated for effectiveness on only one occasion (Burris, 2005; Keough, 2005; Wade, 2005). In Cleveland, Ohio, 15 churches signed up to participate in the program in 2005 (Keough). The ADA reported statistics from the CDC on diabetes and calculated the projected number of members at each church who might get diabetes. They also calculated how much the disease would cost churches and the community. An ambassador from one church stated that many of the members were skeptical about participating because of the Tuskegee experiment. Out of 3,000 members at that church, 189 were projected to develop diabetes; 29 would be undiagnosed for 10 years and wage loss would be more than \$2 million (Keough). In Baltimore, Maryland, 27 churches participated in the program as of April, 2005. Participants at St. Stephens African Episcopal Methodist church believe that they were called by the spirit to break the curse of diabetes in a state where 390,950 people are diabetic (Burris).

In a research study conducted in Tennessee, participants of the ProjectPower program were tested on their knowledge of diabetes (Wade, 2005). The study was a pre-test post-test descriptive study using a volunteer convenience sample of 41 participants between the ages of 25 and 72, the majority of whom were female. Half of the participants reported having diabetes, and half reported not having diabetes. Based on

the results, participants' knowledge increased after participating in the diabetes awareness sessions. However, the results did not provide evidence of an increase in readiness to change, which could be because of a lack of participation in a two-session workshop. Readiness to change was shown in only one participant who received all information by attending both sessions (Wade).

Finally, researchers at John's Hopkins are currently conducting a research study on ProjectPower. In addition to using the ProjectPower modules as an intervention, researchers are proposing the make changes in the environment by changing the food and physical activity environment. Making changes in the community will allow participants to make better choices. This projected is being conducted September 1, 2008 through June 30, 2011. The proposed sample will be recruited through 15 churches in low-income areas of Baltimore (ADA, n.d.f).

Diabetes Health in Faith-based Organizations Including African Americans

Two Feathers et al. (2007) conducted a process evaluation on the Journey to Health intervention which was designed specifically for African Americans to promote behaviors key to diabetes self-management such as healthy eating and exercise. Out of 111 African American and Hispanic participants, participation was higher among African Americans. Five two-hour focus groups were held every four weeks in community locations, including churches, to discuss the impact of diabetes on participants. Healthy lifestyle interventions were also conducted. Missed meetings were made up by conducting them one on one with participants. Two hundred and three class evaluations showed that 98.4% of the respondents were satisfied with the intervention meetings, and

32 participants in the post intervention focus groups reported that the curriculum was culturally appropriate and well organized (Two Feathers et al.).

Diabetes Health in the Community

Mayer-Davis et al. (2004) conducted a 12-month randomized clinical trial with 152 participants. The program included an intensive-lifestyle (“modeled after the NIH Diabetes Prevention Program” p. 1736) and reimbursable lifestyle intervention (“delivered in the time allotted for Medicare reimbursement for diabetes education related to nutrition and physical activity” p. 1736) consisting of diabetes education related to nutrition and physical activity. The usual care served as the control group. The setting for the interventions was primary health care centers in rural counties that had a large number of patients receiving diabetes care. Mayer-Davis et al. reported that the results showed modest weight loss among intensive-lifestyle participants and no difference among reimbursable-lifestyle and usual care participants.

Conclusion and Gaps

A review of the literature regarding the impact of diabetes education programs on African Americans discussed diabetes knowledge, empowerment and readiness to change. This review revealed that African American women were more likely to participate in diabetes education studies than African American men (Hargreaves et al. 2002; Lach et al. 2004; Song et al. 2004). Past studies have shown that church-based collaborations with health education and promotion efforts can be effective. Studies have also shown that pastors are willing to participate in health education promotion programs that keep paperwork to a minimum, and fully explain the purpose and projected outcomes

to them. Numerous articles focused on diabetes prevention efforts, particularly regarding healthy eating and exercise. Many of these studies provided education and measurements of either glucose levels and/or weight loss. The programs did not specifically focus on knowledge measurements alone.

The Ecological Model and the Stages of Change Theory were used in studies that investigated healthy eating and exercise. “The limitations of existing health promotion models emphasize the need for a shift toward a more comprehensive approach that acknowledges the importance of social context” (Stokols, 1996, as cited in Fluery & Lee, 2006, p.130). Furthermore, significant gaps persist in knowledge related to the adult learner’s characteristics in diabetes education (Walker, 1999). Other studies indicated that there is a need for interventions containing outcome measures that show the impact of learning, behavior, clinical indicators and long-term quality of life outcomes on health status and improved patient knowledge and behavior (Rickheim et al., 2002). According to Leonard, Liburd, Spencer, and Airhihenbuwa (2004), quality instruments are needed to capture the effects or intermediate outcomes of interventions. It is evident that education increases knowledge, but what method of education works best for which groups of people remains unknown (Peyrot, 1999). The purpose of this dissertation is to lay the groundwork for research and evaluate the impact of ProjectPower on African Americans in Houston/Harris County, Texas.

CHAPTER III

METHODOLOGY

The purpose of this chapter is to outline the methodology used in this study. The study design, sampling, site description and data collection process are discussed. The informed consent form design and process for receiving IRB approval is also discussed. A description of the instruments and plans for data analyses are also discussed.

Study Design

The study used a pre-test/post-test survey design that included both open-ended and closed-ended questions. Participants were surveyed before and after a three-module workshop. Participants were also invited to participate in a one-month follow-up survey.

Sampling

A volunteer convenience sample of 48 church members, family and friends participated in the study. The inclusion criteria were: African American male and females ages 18 years and older who lived in the Houston/Harris County, Texas and surrounding areas. Those with or without diabetes participated. Participants were volunteers who could read, write and comprehend English.

Data Collection Process

An application for approval was submitted to the Texas Woman's University (TWU) IRB and approved on June 12, 2008. Preparation for the study began on June 19, 2008. Following approval from the TWU IRB and dissertation committee members,

participants in the Houston/Harris County and surrounding areas were recruited through three cooperating Christian churches through flyers for the initial workshop (Appendix A). Church representatives placed flyers on bulletin boards, in printed announcements and in church newsletters. Verbal announcements were made in church, and printed announcements (Appendix B) were placed on a Christian radio station website (Appendix C). Flyers were distributed in the grocery stores, beauty salons, the health department, local physician offices, colleges, and door-to-door.

Workshops that follow the ProjectPower curriculum were facilitated beginning June 19, 2008 (Appendix D). Individuals interested in participating in the survey and workshop had the opportunity to sign up by calling the researcher or the church representatives and/or designee helping to coordinate the event. Individuals also signed up by appearing at the event. Those individuals signing up used a unique participant code only identifiable to the participant. Participants used the same code on the participant code line of each questionnaire. Information regarding signing up using participant code was printed on flyers, and potential participants were also given information about signing up with a participant code when they contacted the church representative and researcher for more information.

Informed Consent

A cover letter explaining the study was attached to the surveys (Appendices E, F, G, H, and I) and written consent form (Appendix J). Participants received this cover letter and written consent forms outlining the study protocol and potential risks at the beginning of the workshop. The researcher reviewed the consent form with the

participants, and the participants had the opportunity to ask the researcher questions about the study. Participants were given the option to quit at any time and were asked to indicate their consent by signing the informed consent form. Participant data and all instruments were protected for confidentiality. Completed documents were stored in a locked file cabinet and will be destroyed after one year.

Study Instruments

The following instruments were used in the study:

1. Demographic Profile (Appendix F).

The Demographic Profile is a set of demographic questions developed by Wade (2005) for use in a study conducted on the ProjectPower program.

2. The Diabetes Knowledge Test (DKT; Appendices G and L)

The original diabetes knowledge test was developed and tested for reliability and validity by the Michigan Diabetes Research Training Center (MDRTC) and used by Fitzgerald et al. (1998). In the study conducted by Wade (2005), 14 items of the original 33 item diabetes knowledge test were used.

The test readability was measured by the Flesch-Kincaid grade level, and the reading level for the test items is at the 6th grade level. The MDRTC tested validity and reliability of the DKT using a total sample of 811. For items 1-14, the item-total correlation ranged from 0.22 – 0.43. The coefficient alpha for the general test and the insulin-use scale indicated that both are reliable with $\alpha \geq 0.70$ (Wade, 2005, p. 20).

In this study, nine of the original 33 item diabetes knowledge tests were used.

The nine items were matched to the educational program and included questions 1-5, 7, 9, 12, and 14. A score ranging from 0-10 was assigned with 10 representing the maximum number correct. The test readability was measured by the Flesch-Kincaid grade level, and the reading level for the test items is at the 3rd grade reading level.

Instrument Reliability

Each of the multiple choice questions in the diabetes knowledge questionnaire were examined to see if participants were more likely to choose some options over other options (e.g., for question 1, were they more likely to choose “b” instead of “a,” “c,” or “d”?). Each of the nine questions was examined for both pre-test and post-test responses.

For the pre-test: For all of the items except number 5, participants were significantly more likely to choose some options more than others. For question 5, participants were just as likely to choose any of the four options, a-d. For the post-test: For all of the items except number 6, participants were significantly more likely to choose some options more than others. For question 6, participants were just as likely to choose any of the three options, a-c. Next, each of the multiple choice questions in the diabetes knowledge questionnaire were examined to see if the participants were more likely to choose the CORRECT option over the other options. Each of the nine questions were examined for both pre-test and post-test responses. For the pre-test: For questions 1, 2, 7, 8, and 9, participants were significantly more likely to choose the correct response versus an incorrect response. For question 5, participants were significantly more likely

to choose an incorrect response versus the correct response. For questions 3, 4, and 6, participants were just as likely to choose the correct response as they were to choose an incorrect response. For the post-test: For questions 1, 2, 4, 7, 8, and 9, participants were significantly more likely to choose the correct response versus an incorrect response. For questions 3, 5, and 6, participants were just as likely to choose the correct response as they were to choose an incorrect response.

3. Diabetes Readiness to Change Scale (DES; Appendices H and M)

The long version of the DES was developed by MDRTC in 2000 to measure the psychosocial self-efficacy of people with diabetes. The Diabetes Readiness to Change Scale, a subset of the DES, “assesses dissatisfaction and readiness to change with 9 items $\alpha = 0.81$ ” (MDRTC, n.d.). Question 1 was also used to assess empowerment ranges. The instrument uses a 5-point Likert scale where 1= Strongly Agree, and 5= Strongly Disagree

4. Additional Questionnaire (Appendix I)

The questions in Appendix I are being used to determine ecological influencers that may affect participants’ readiness to change.

Workshop Procedure

The researcher welcomed and thanked each participant for participating (Appendix K). Each participant was given a two-pocket folder with the consent letter and written informed consent form on the left side and the demographic sheet and pre-test on the right side. Colored paper was used to distinguish between pre-test and post-test. The researcher reviewed the consent form with the participants, and the participants had the

opportunity to ask the researcher questions about the study and could choose to quit at any time. Participants indicated their consent by signing the informed consent form.

The researcher instructed the group to print a number (only identifiable to the participant) on the participant code line of each form. The researcher remained in the room while participants completed the instruments. Anticipated time to complete the consent letter, demographic sheet, and pre-test was 25 minutes. The researcher completed the ProjectPower education session in approximately 45 minutes. Upon completion of the session, the post-test was distributed for completion. Anticipated completion time for the post-test was 25 minutes. The researcher instructed the group to insert the same participant code used on the pre-test on the post-test. Any participant attending the workshop that was not willing to complete the questionnaires was allowed to complete the workshop and submit a blank questionnaire. The researcher collected the post-test and thanked the participants for their time

The post-test survey asked participants if they would be willing to participate in a one-month follow-up survey by email. Participants who chose to participate in the one-month follow completed an electronic survey hosted by PsychData.com. Participants who volunteered for this portion of the study provided the researcher with an email address that the researcher used to send out the hyperlink to the electronic survey one month after the intervention. Participants were asked not to include their names, only an email address. The follow-up electronic survey contained the phrase, "Your submission of this survey signifies your informed consent to participate in this research. There is a potential risk of loss of confidentiality in all email, downloading, and internet transactions."

(Appendices L and M). The estimated time to complete the follow-up survey was 20 minutes.

Data Analysis

Descriptive statistics were used to analyze participant demographic data. Qualitative data obtained from responses to the additional questions was coded and arranged for analysis according to general categories or themes and subcategories or sub- themes (Ormrod & Leedy, 2005). ANOVA was used to test hypotheses 1-3 to determine if there were significant differences in participants' pre/post-test and one-month follow-up knowledge, readiness to change, and feelings of empowerment scores. All statistical tests were run at the .05 alpha levels. Data from Statistical Package for the Social Sciences (SPSS) software package Version 15 was used to analyze the survey data.

CHAPTER IV

RESULTS

Demographics

The sample included a total of 48 participants. As shown in Table 1, the majority of the participants were female (79.2%), and 20.8% were males. Approximately half of the participants reported that they were married (52.1%), one-quarter reported that they were single (25.0%), and smaller proportions indicated that they were divorced (12.5%) or had another marital status (10.4%). Only 16.7% of the sample reported that they had no children, with the majority indicating that they had at least one child. More specifically, nearly 30% reported that they had one child (27.1%) and just over 30% had two children (35.4%). Smaller proportions of the sample had more than two children: 8.3% had three children, 6.2% had four children, 2.1% had five children, and 4.2% had six children.

In terms of highest education level, about 10% had completed some high school (10.4%), about one-third of the participants had completed some college (33.3%), and over half had earned a Bachelor's degree or higher (56.3%). Finally, more than half of the participants reported annual incomes of \$45,000 or greater (58.3%). Approximately equal numbers of participants reported earning \$30,000 to \$44,999 a year (14.6%) and \$15,000 to \$29,999 a year (12.5%), whereas only 6.3% reported incomes less than \$15,000 a year (see Table 1).

Table 1

Frequencies and Percentages for Gender, Marital Status, Number of Children, Education Level, and Income Level

	n	%
Gender		
Male	10	20.8
Female	38	79.2
Marital Status		
Married	25	52.1
Divorced	6	12.5
Single	12	25.0
Other	5	10.4
Number of Children		
0	8	16.7
1	13	27.1
2	17	35.4
3	4	8.3
4	3	6.2
5	1	2.1
6	2	4.2
Education Level		
Some High School	5	10.4
Some College	16	33.3
Bachelors Degree or Higher	27	56.3
Income Level		
Less than \$15,000	3	6.3
\$15,000 - \$29,999	6	12.5
\$30,000 - \$44,999	7	14.6
\$45,000 or more	28	58.3

The means and standard deviations for the continuous demographic variables are displayed in Table 2. Participants were, on average, 60 years of age ($M = 60.52$, $SD = 15.00$) and ranged from 18 years to 82 years of age. The average height was 63.70 inches ($SD = 1.94$), and ranged from 60 to 67 inches. Participant weight ranged from 110 pounds to 350 pounds, with an average weight of 176.13 pounds ($SD = 43.29$). In terms of exercise each week, participants reported exercising an average of 71.35 minutes each week ($SD = 97.21$), which ranged from 0 to 360 minutes per week.

Table 2

Descriptive Statistics for Age, Height, Weight, Total Minutes Exercised per Week

	Mean	SD	Min	Max
Age	63.60	8.81	18	82
Height	63.70	1.94	60	67
Weight	176.13	43.29	110	350
Total Minutes Exercised per Week	71.35	97.21	0	360

As shown in Table 3, less than half of the participants reported that they had been diagnosed with diabetes (41.7%), and 56.3% had not been diagnosed with diabetes. Of those who indicated that they had diabetes, 50.0% had been diagnosed within the past six years (20% in past one year, 20% in past two years, 5% in past three years, 5% in past 6 years), and 50% had been diagnosed between 10 and 30 years ago (15% in past 10 years, 15% in past 15 years, 10% in past 17 years, 5% in past 20 years, 5% in past 30 years).

Table 3

Frequencies and Percentages for Diabetes Diagnosis, Years Since Diagnosis, Diabetes Education, Years Since Diabetes Education, and Diabetes Support Group Attendance

	n	%
Diabetes Diagnosis		
No	27	56.3
Yes	20	41.7
Years since Diagnosis		
1	4	20.0
2	4	20.0
3	1	5.0
6	1	5.0
10	3	15.0
15	3	15.0
17	2	10.0
20	1	5.0
30	1	5.0
Diabetes Education		
No	30	62.5
Yes	18	37.5
Years since Diabetes Education		
0	7	38.9
1	2	11.1
2	1	5.6
3	3	16.7
6	1	5.6
10	2	11.1
15	2	11.1
Member of Diabetes Support Group		
No	44	91.7
Yes	4	8.3

Nearly two-thirds of the participants reported that they had not attended a diabetes education course (62.5%), and 37.5% indicated that they had attended a course.

Approximately 40% of those who had attended a diabetes education course had done so within the past year (38.9%), 11.1% had attended one year prior to the survey, 5.6% two years prior, 16.7% three years prior, 5.6% six years prior, 11.1% ten years prior, and 11.1% had attended fifteen years prior to the study. Finally, a majority of the participants reported that they were not a part of a diabetes support group (91.7%), with less than 10% reporting that they were members of a diabetes support group (8.3%).

As part of the survey, participants were asked to report whether or not they exercised, as well as more specific information about their exercise routine, including the number of days they exercised each week and how many minutes they exercised each day. The frequencies and percentages for the responses are displayed in Table 4. Most of the respondents indicated that they exercised (85.4%), with only 14.6% reporting that they did not exercise. More than half of the sample indicated that they exercised two to four days each week, with 18.7% reporting exercise on two days, 27.1% exercising three days, and 12.5% reporting exercise on four days. The remainder of the sample reported exercising zero days a week (22.9%), one day a week (2.1%), five days a week (14.6%), or seven days a week (2.1%). In terms of the number of minutes of exercise per day, nearly 40% reported 0 minutes of exercise (37.5%) and 25% reported 30 minutes of exercise. The remaining 37.5% reported between 1 and 20 minutes of exercise (18.8%) or between 45 and 120 minutes of exercise (18.7%).

Table 4

*Frequencies and Percentages for Exercise, Exercise per Week, Exercise per Day,
Examine Feet*

	n	%
Do you Exercise		
No	7	14.6
Yes	41	85.4
Exercise per Week		
0 Days	11	22.9
1 Days	1	2.1
2 Days	9	18.7
3 Days	13	27.1
4 Days	6	12.5
5 Days	7	14.6
7 Days	1	2.1
Exercise per Day		
0 Minutes	18	37.5
1 Minutes	1	2.1
3 Minutes	1	2.1
5 Minutes	1	2.1
12 Minutes	1	2.1
15 Minutes	2	4.2
20 Minutes	3	6.2
30 Minutes	12	25.0
45 Minutes	3	6.2
55 Minutes	1	2.1
60 Minutes	3	6.2
90 Minutes	1	2.1
120 Minutes	1	2.1
Do you examine your feet?		
No	12	25.0
Yes	36	75.0

In addition, Table 4 displays the frequency and percentages for whether the participants reported that they examine their feet. Three quarters of participants reported examining their feet (75.0%), whereas 25.0% reported not examining their feet.

Instrument Reliability

The chi-square goodness of fit was used to determine whether certain response options were selected more frequently than others for the multiple choice items contained in the Diabetes Knowledge Test. Each of the nine items was examined at pre-test and post-test. As shown in Table 5, at pre-test there was a significant difference in the number of times an answer was selected for all of the items, with the exception of item five. Specifically for Item 1, *The diabetes diet is*, a majority of the respondents selected answer b, *a healthy diet for most people* (77.1%), $\chi^2(3) = 82.73, p < .001$. Similarly, 70.8% of the participants chose answer c, *Baked potato* for Item 2, *Which of the following is highest in carbohydrate?*, $\chi^2(3) = 63.00, p < .001$. The most common responses for Item 3, *Which of the following is highest in fat?* were answer a, *Low-fat milk* (41.7%) and answer c, *Corn* (29.2%), $\chi^2(3) = 19.52, p < .001$. A greater proportion of respondents selected answer d, *Any food that has less than 20 calories per serving* (41.7%) for Item 4, *Which of the following is a "free food"?* compared to answer a, *Any unsweetened food* (14.6%), answer b, *Any dietetic food* (14.6%), or answer c, *Any food that says "sugar free" on the label* (16.7%), $\chi^2(3) = 11.52, p < .01$.

Table 5

Frequencies and Percentages for Diabetes Knowledge Item Answers for Pre-test

	n	%	χ^2	P*
Item 1: The diabetes diet is:			82.73	.000
a. the way most American people eat	3	6.3		
b. a healthy diet for most people	37	77.1		
c. too high in carbohydrate for most people	4	8.3		
d. too high in protein for most people	0	.0		
Item 2: Which of the following is highest in carbohydrate?			63.00	.000
a. Baked chicken	1	2.1		
b. Swiss cheese	7	14.6		
c. Baked potato	34	70.8		
d. Peanut butter	3	6.3		
Item 3: Which of the following is highest in fat?			19.52	.000
a. Low-fat milk	20	41.7		
b. Orange juice	1	2.1		
c. Corn	14	29.2		
d. Honey	7	14.6		
Item 4: Which of the following is a "free food"?			11.52	.009
a. Any unsweetened food	7	14.6		
b. Any dietetic food	7	14.6		
c. Any food that says "sugar free" on the label	8	16.7		
d. Any food that has less than 20 calories per serving	20	41.7		
Item 5: Glycosylated hemoglobin (hemoglobin A1) is a test that is a measure of your average blood glucose level for the past			1.44	.696
a. day	12	25.0		
b. week	7	14.6		
c. 6-10 weeks	11	22.9		
d. 6 months	11	22.9		

Note. $\alpha = .05$

Table 5, continued

Frequencies and Percentages for Diabetes Knowledge Item Answers for Pre-test

	n	%	χ^2	P*
Item 6: What effect does unsweetened fruit juice have on blood glucose?			6.05	.049
a. Lowers it	7	14.6		
b. Raises it	19	39.6		
c. Has no effect	18	37.5		
Item 7: For a person in good control, what effect does exercise have on blood glucose?			70.59	.000
a. Lowers it	39	81.3		
b. Raises it	0	.0		
c. Has no effect	2	4.2		
Item 8: Eating foods lower in fat decreases your risk for:			94.85	.000
a. nerve disease	0	.0		
b. kidney disease	3	6.3		
c. heart disease	36	75.0		
d. eye disease	0	.0		
Item 9: Which of the following is usually <u>not</u> associated with diabetes:			65.24	.000
a. vision problems	1	2.1		
b. kidney problems	0	.0		
c. nerve problems	8	16.7		
d. lung problems	32	66.7		

Note. $\alpha=.05$

For Item 6, *What effect does unsweetened fruit juice have on blood glucose?*, respondents tended to select answer b, *Raises it* (39.6%) or answer c, *Has no effect* (37.5%), $\chi^2(2) = 6.05, p < .05$. Nearly all of the participants selected answer a, *Lowers it*

for item 7, *For a person in good control, what effect does exercise have on blood glucose?*, (81.3%), $\chi^2(2) = 70.59, p < .001$. Likewise, a majority of the respondents chose answer c, *heart disease* for Item 8, *Eating foods lower in fat decreases your risk for*, (75.0%), $\chi^2(3) = 94.85, p < .001$. Finally, for Item 9, *Which of the following is usually not associated with diabetes*, 66.7% of the participants selected answer d, *lung problems*, $\chi^2(3) = 65.24, p < .001$.

The post-test responses for the Diabetes Knowledge items are displayed in Table 6. The results of the chi-square tests revealed significant effects for all of the items except Item 6, *What effect does unsweetened fruit juice have on blood glucose?*. Most of the respondents selected answer b, *a healthy diet for most people*, for Item 1, *The diabetes diet is*, (68.8%), $\chi^2(3) = 68.56, p < .001$. For Item 2, *Which of the following is highest in carbohydrate?*, a majority of the participants chose answer c, *Baked potato* (64.6%), $\chi^2(3) = 53.28, p < .001$. Nearly 40% of the sample chose answer a, *Low-fat milk*, for Item 3, *Which of the following is highest in fat?* (39.6%) and about 30% chose answer c, *Corn* (31.3%), $\chi^2(3) = 16.44, p < .01$. A majority of the respondents selected answer d, *Any food that has less than 20 calories per serving*, for Item 4, *Which of the following is a "free food"?* (68.8%), $\chi^2(3) = 62.40, p < .01$. For Item 5, *Glycosylated hemoglobin (hemoglobin A1) is test that is a measure of your average blood glucose level for the past*, roughly half of the sample chose answer c, *6-10 weeks*, (47.9%), $\chi^2(3) = 21.34, p < .001$. Nearly all of the respondents selected answer a, *Lowers it*, for Item 7, *For a person in good control, what effect does exercise have on blood glucose?*, (81.3%), $\chi^2(2) = 67.00, p < .001$. Similarly, approximately 80% selected answer c, *heart disease*,

for Item 8, *Eating foods lower in fat decreases your risk for*, (79.2%), $\chi^2(3) = 92.16, p < .001$. Finally, for Item 9, *Which of the following is usually not associated with diabetes*, most of the sample chose answer d, *lung problems*, $\chi^2(3) = 61.65, p < .001$.

Table 6

Frequencies and Percentages for Diabetes Knowledge Item Answers for Post-test

	n	%	χ^2	P*
Item 1: The diabetes diet is:			68.56	.000
a. the way most American people eat	5	10.4		
b. a healthy diet for most people	33	68.8		
c. too high in carbohydrate for most people	3	6.3		
d. too high in protein for most people	0	.0		
Item 2: Which of the following is highest in carbohydrate?			53.28	.000
a. Baked chicken	1	2.1		
b. Swiss cheese	3	6.3		
c. Baked potato	31	64.6		
d. Peanut butter	8	16.7		
Item 3: Which of the following is highest in fat?			16.44	.001
a. Low-fat milk	19	39.6		
b. Orange juice	2	4.2		
c. Corn	15	31.3		
d. Honey	7	14.6		
Item 4: Which of the following is a "free food"?			62.40	.000
a. Any unsweetened food	6	12.5		
b. Any dietetic food	2	4.2		
c. Any food that says "sugar free" on the label	2	4.2		
d. Any food that has less than 20 calories per serving	33	68.8		

Note. $\alpha=.05$

Table 6, continued

Frequencies and Percentages for Diabetes Knowledge Item Answers for Post-test

	n	%	χ^2	P*
Item 5: Glycosylated hemoglobin (hemoglobin A1) is a test that is a measure of your average blood glucose level for the past			21.34	.000
a. day	7	14.6		
b. week	5	10.4		
c. 6-10 weeks	23	47.9		
d. 6 months	6	12.5		
Item 6: What effect does unsweetened fruit juice have on blood glucose?			1.14	.567
a. Lowers it	13	27.1		
b. Raises it	18	37.5		
c. Has no effect	13	27.1		
Item 7: For a person in good control, what effect does exercise have on blood glucose?			67.00	.000
a. Lowers it	39	81.3		
b. Raises it	1	2.1		
c. Has no effect	2	4.2		
Item 8: Eating foods lower in fat decreases your risk for:			92.16	.000
a. nerve disease	2	4.2		
b. kidney disease	2	4.2		
c. heart disease	38	79.2		
d. eye disease	1	2.1		
Item 9: Which of the following is usually <u>not</u> associated with diabetes:			61.65	.000
a. vision problems	1	2.1		
b. kidney problems	0	.0		
c. nerve problems	10	20.8		
d. lung problems	32	66.7		

Note. $\alpha = .05$

The knowledge test items were recoded to reflect a correct or incorrect answer. The items were then examined using chi-square goodness of fit tests to determine whether participants chose the correct answer more frequently than an incorrect answer. The pre-test item frequencies are displayed in Table 7. The results revealed significant differences for six of the nine items. A significantly greater proportion of the respondents selected the correct answer for Item 1, *The diabetes diet is*, (77.1%), $\chi^2(1) = 20.45, p < .001$. Likewise, for Item 2, *Which of the following is highest in carbohydrate?*, 70.8% of the sample chose the correct answer, $\chi^2(1) = 11.76, p < .01$. Similarly, a majority of the respondents selected the correct answer for Item 7, *For a person in good control, what effect does exercise have on blood glucose?*, (81.3%), $\chi^2(1) = 33.39, p < .001$. A significantly greater number of participants chose the correct answer for Item 8, *Eating foods lower in fat decreases your risk for*, (75.0%), $\chi^2(1) = 27.92, p < .001$. Approximately 70% of the respondents selected the correct response option for Item 9, *Which of the following is usually not associated with diabetes*, (66.7%), $\chi^2(1) = 12.90, p < .001$. Finally, a significantly greater proportion of respondents selected the incorrect response for Item 5, *Glycosylated hemoglobin (hemoglobin A1) is test that is a measure of your average blood glucose level for the past*, (62.5%), $\chi^2(1) = 8.80, p < .01$. In terms of the remaining items, roughly equal proportions of participants chose the correct response and an incorrect response for Item 3, *Which of the following is highest in fat?*, $\chi^2(1) = .10, p = .758$, Item 4, *Which of the following is a "free food"?*, $\chi^2(1) = .10, p = .758$, and Item 6, *What effect does unsweetened fruit juice have on blood glucose?*, $\chi^2(1) = .82, p = .366$.

Table 7

*Frequencies and Percentages for Diabetes Knowledge Item Correct Versus Incorrect
Answers for Pre-test*

	n	%	χ^2	P*
Item 1: The diabetes diet is:			20.45	.000
Incorrect	7	14.6		
Correct	37	77.1		
Item 2: Which of the following is highest in carbohydrate?			11.76	.001
Incorrect	11	22.9		
Correct	34	70.8		
Item 3: Which of the following is highest in fat?			.10	.758
Incorrect	22	45.8		
Correct	20	41.7		
Item 4: Which of the following is a "free food"?			.10	.758
Incorrect	22	45.8		
Correct	20	41.7		
Item 5: Glycosylated hemoglobin (hemoglobin A1) is a test that is a measure of your average blood glucose level for the past			8.80	.003
Incorrect	30	62.5		
Correct	11	22.9		
Item 6: What effect does unsweetened fruit juice have on blood glucose?			.82	.366
Incorrect	25	52.1		
Correct	19	39.6		

Note. $\alpha = .05$

Table 7, continued

Frequencies and Percentages for Diabetes Knowledge Item Correct Versus Incorrect Answers for Pre-test

	n	%	χ^2	P*
Item 7: For a person in good control, what effect does exercise have on blood glucose?			33.39	.000
Incorrect	2	4.2		
Correct	39	81.3		
Item 8: Eating foods lower in fat decreases your risk for:			27.92	.000
Incorrect	3	6.3		
Correct	36	75.0		
Item 9: Which of the following is usually <u>not</u> associated with diabetes:			12.90	.000
Incorrect	9	18.8		
Correct	32	66.7		

Note. $\alpha=.05$

The post-test items for the Diabetes Knowledge Test are displayed in Table 8. The chi-square goodness of fit test revealed significant differences for six of the nine items. For these six items, respondents selected the correct answer more often than the incorrect answer. More specifically, for Item 1, *The diabetes diet is*, nearly 70% chose the correct answer (68.8%), $\chi^2(1) = 15.24, p < .001$. Similarly, a majority of the sample selected the correct answer for Item 2, *Which of the following is highest in carbohydrate?*, (64.6%), $\chi^2(1) = 8.40, p < .01$. For Item 4, *Which of the following is a "free food"?*, nearly 70% of the respondents chose the correct answer (68.8%), $\chi^2(1) = 12.30, p < .001$. A

significantly greater proportion of participants selected the correct answer for Item 7, *For a person in good control, what effect does exercise have on blood glucose?*, (81.3%), $\chi^2(1) = 30.86, p < .001$. Likewise, 79.2% chose the correct answer for Item 8, *Eating foods lower in fat decreases your risk for*, $\chi^2(1) = 25.33, p < .001$. Finally, for Item 9, *Which of the following is usually not associated with diabetes*, approximately two-thirds of the respondents selected the correct answer (66.7%), $\chi^2(1) = 10.26, p < .01$. In terms of the remaining three items, participants selected the correct answer roughly as often as the incorrect answer for Item 3, *Which of the following is highest in fat?*, $\chi^2(1) = .58, p = .446$, Item 5, *Glycosylated hemoglobin (hemoglobin A1) is test that is a measure of your average blood glucose level for the past*, $\chi^2(1) = .61, p = .435$, and Item 6, *What effect does unsweetened fruit juice have on blood glucose?*, $\chi^2(1) = 1.45, p = .228$.

Table 8

Frequencies and Percentages for Diabetes Knowledge Item Correct Versus Incorrect Answers for Post-test

	n	%	χ^2	P^*
Item 1: The diabetes diet is:			15.24	.000
Incorrect	8	16.7		
Correct	33	68.8		
Item 2: Which of the following is highest in carbohydrate?			8.40	.004
Incorrect	12	25.0		
Correct	31	64.6		

Note. $\alpha = .05$

Table 8, continued

*Frequencies and Percentages for Diabetes Knowledge Item Correct Versus Incorrect**Answers for Post-test*

	n	%	χ^2	P*
Item 3: Which of the following is highest in fat?			.58	.446
Incorrect	24	50.0		
Correct	19	39.6		
Item 4: Which of the following is a "free food"?			12.30	.000
Incorrect	10	20.8		
Correct	33	68.8		
Item 5: Glycosylated hemoglobin (hemoglobin A1) is a test that is a measure of your average blood glucose level for the past			.61	.435
Incorrect	18	37.5		
Correct	23	47.9		
Item 6: What effect does unsweetened fruit juice have on blood glucose?			1.45	.228
Incorrect	26	54.2		
Correct	18	37.5		
Item 7: For a person in good control, what effect does exercise have on blood glucose?			30.86	.000
Incorrect	3	6.3		
Correct	39	81.3		
Item 8: Eating foods lower in fat decreases your risk for:			25.33	.000
Incorrect	5	10.4		
Correct	38	79.2		
Item 9: Which of the following is usually <u>not</u> associated with diabetes:			10.26	.001
Incorrect	11	22.9		
Correct	32	66.7		

Note. $\alpha=.05$

Primary Analyses

In order to determine whether there were significant differences between pre-test scores and post-test scores, repeated measures analyses of variance (-s) were conducted. More specifically, three separate repeated measure ANOVAs were conducted on the pre and post scores for the Diabetes Knowledge Test, Readiness to Change Scores, and Diabetes Empowerment Scores. The means and standard deviations are displayed in Table 9. The results revealed a significant effect for time on the Diabetes Knowledge Test scores, $F(1, 41) = 4.98, p < .05, d = .274$. The post-test knowledge scores were significantly greater ($M = 6.24, SD = 1.75$) than the pre-test knowledge scores ($M = 5.76, SD = 1.75$). The results failed to reveal significant differences between the pre and post scores for Readiness to Change, $F(1, 45) = 1.09, p = .301, d = .120$ or the pre and post scores for Diabetes Empowerment, $F(1, 47) = 2.19, p = .146, d = .174$.

Pearson's Product Moment correlations were conducted to examine the relationships between the pre and post scores for Diabetes Knowledge, Readiness to Change, and Diabetes Empowerment. As shown in Table 10, there was a significant positive correlation between the pre and post scores for the Diabetes Knowledge Test scores, $r(40) = .688, p < .001$. This finding indicates that participants who had higher scores at the pre-test tended to have higher scores at the post-test. Similarly, there was a significant positive correlation between the pre and post scores for Readiness to Change, $r(44) = .694, p < .001$. This indicates that higher scores on the pre-test were associated with higher scores on the post-test. Finally, there was a significant positive correlation between the pre and post scores for the Diabetes Empowerment Scores, $r(46) = .677, p <$

.001, indicating that greater empowerment scores at pre-test were associated with greater empowerment scores at post-test.

Table 9

Means and Standard Deviations for Pre and Post Diabetes Knowledge Test Scores, Readiness to Change Scores, and Diabetes Empowerment Scale Scores

	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>F</i>	<i>P*</i>
Diabetes Knowledge Test Scores				4.98	.031
Pre	42	5.76	1.75		
Post	42	6.24	1.75		
Readiness to Change Scores				1.09	.301
Pre	46	1.67	1.00		
Post	46	1.79	1.00		
Diabetes Empowerment Scale				2.19	.146
Pre	48	1.74	1.13		
Post	48	1.94	1.17		

Note. $\alpha=.05$

Table 10

Pearson's Product Moment Correlations for Pre and Post Diabetes Knowledge Test, Readiness to Change Scores, and Diabetes Empowerment Scale Scores

	Post-Test
Diabetes Knowledge Pre-test ($n = 42$)	.688 **
Readiness to Change Pre-test ($n = 46$)	.694 **
Empowerment Scale Pre-test ($n = 48$)	.677 **

Qualitative Data

With Diabetes

What are your thoughts about type 2 diabetes? Of the 21 people who responded to the question regarding their thoughts about type 2 diabetes, 19.0% ($n = 4$) responded that they either hated having diabetes or that they “prayed never to have it.” Another 19.0% ($n = 4$) responded to the dangerous characteristics of diabetes, such as the disease is “very dangerous.” Other individuals (9.0%) responded that they believed that the faith-based programs are good ($n = 2$). Other respondents (19.0%) indicated that they needed to monitor their diabetes ($n = 4$) while others (14.3%) responded that they were not concerned about their diabetes ($n = 3$). Finally, other respondents (19.0%) gave unique answers, stating that they found diabetes to be “challenging” or that they needed to “change attitudes” about the disease ($n = 4$).

What factors impact your diabetes care (positive or negative)? Of the 15 people who responded to the question regarding the factors, either positive or negative, that impacted their diabetes care, a quarter of the participants (26.7%) responded with positive compliments, stating that the program was “nice” ($n = 4$). A majority of respondents (46.7%) stated that food and exercise were factors that impacted their diabetes care ($n = 7$). Others (13.3%) listed stress as one of the factors that impacted their diabetes care ($n = 2$). Finally, the remaining individuals (13.3%) responded with unique factors impacting their diabetes care, such as not accurately taking their blood sugar or the debilitating effects of the disease ($n = 2$).

What are your concerns about the disease? Of the 19 people who responded to the question regarding their concerns about diabetes, a majority of respondents (42.1%) were concerned about the impact of diabetes on their health, stating that they were concerned about “losing body parts and amputations” and as well as being concerned about the “long term effects” of diabetes ($n = 8$). amputations or “loss of body parts,” heart problems or their life. Others (36.8%) were concerned about the need to be healthier and “control their blood sugar” as well as avoiding medications suggested by their physicians and reducing complications ($n = 7$). Finally, other respondents (21%, or $n = 4$) were concerned with receiving more information about diabetes, support groups, or the fact that having diabetes was “no good.”

What are your thoughts about faith-based diabetes education programs? Of the 19 people who responded to the question regarding their thoughts about faith-based diabetes education programs, a majority (84.2%) responded positively to faith-based

programs about diabetes ($n = 16$). Many individuals responded that the programs are “beneficial, relearning things you have forgotten,” or “informational education are compatible with our faith.” The remaining individuals (15.8%, or $n = 3$) responded with neutral responses, such as “so far, the information is very basic.”

What is your overall impression of ProjectPower? Of the 18 people who responded to the question regarding their overall impression of ProjectPower, all individuals responded positively, stating that the program was “very informative” or that it was an “excellent program.”

Without Diabetes

What are your thoughts about faith-based diabetes education programs? Of the nine people who listed their thoughts about faith-based diabetes education programs, all individuals responded positively, stating that they thought faith-based programs were “very informative” and that faith-based programs were “very worthwhile programs to reach diabetics and those without for better health and awareness.”

What is your overall impression of ProjectPower? Of the 11 people who gave their overall impression of ProjectPower, all individuals responded positively, stating that they believed that the program was a good program and that it was very informative.

The additional questions were guided by the Ecological Model which states that people are affected by intrapersonal, interpersonal, community and policy influencers. Based on this assumption, responses to the additional questions can be placed in categories as shown in Table 11. Although the responses to the open-ended questions were very brief, the intrapersonal influencers mainly guided the use of the model. One

response related to the interpersonal influencer and positive comments were made about the program itself.

Table 11

Ecological Assessment of Factors That May Affect Diabetes Care

Intrapersonal

What are your thoughts about type 2 diabetes?

Hated diabetes, challenging
Prayed to never have diabetes
The need to change attitudes

What factors impact your diabetes care (positive or negative)

Food and exercise affects their diabetes
Stress impacted diabetes care
Not accurately testing sugar level
Thoughts of the debilitating affects of the disease

What are your concerns about the disease? The impact of diabetes on their health

Interpersonal

What are your concerns about the disease?

The need for a diabetes support group

Community

What are your thoughts about faith-based diabetes education programs?

Very informative
Worthwhile

What is your overall impression of ProjectPower?

Good program
Very Informative
Excellent

Follow-up Data

Due to an uncontrollable event, Hurricane Ike, only three ($n = 3$) participants completed the follow-up survey. However, the results of these three follow-up surveys are worth mentioning. The frequencies and percentages for the Diabetes Knowledge item responses are displayed in Table 12. All three selected the correct answer for Item 1, *The diabetes diet is*. Similarly, all three participants chose the correct response for Item 2, *Which of the following is highest in carbohydrate*. None of the participants chose the correct response for Item 3, *Which of the following is highest in fat*. One participant selected *orange juice* and the other two chose *corn*, while the correct response was *low-fat milk*. Two participants chose the correct answer for Item 4, *Which of the following is a "free food"*. One selected an incorrect answer, *any unsweetened food*, whereas the other two chose the correct answer, *any food that has less than 20 calories per serving*. All three chose the correct answer for Item 5, *Glycosylated hemoglobin (hemoglobin A1) is a test that is a measure of your average blood glucose level for the past*. The participants all selected different responses for Item 6, *What effect does unsweetened fruit juice have on blood glucose*. One chose the correct answer, *raises it*, and the other two chose incorrect answers (*lowers it, has no effect*). All three participants chose the correct response for Item 7, *For a person in good control, what effect does exercise have on blood glucose*. Similarly, all participants selected the right answer for Item 8, *Eating foods lower in fat decreases your risk for*. Finally, all three participants chose the right answer for Item 9, *Which of the following is usually not associated with diabetes*.

Table 12

Frequencies and Percentages for Follow-Up Test of Diabetes Knowledge Items

	n	%
Item 1: The diabetes diet is b. a healthy diet for most people	3	60.0
Item 2: Which of the following is highest in carbohydrate? c. Baked potato	3	60.0
Item 3: Which of the following is highest in fat? b. Orange juice c. Corn	1 2	20.0 40.0
Item 4: Which of the following is a "free food"? a. Any unsweetened food d. Any food that has less than 20 calories per serving	1 2	20.0 40.0
Item 5: Glycosylated hemoglobin (hemoglobin A1) is a test that is a measure of your average blood glucose level for the past c. 6-10 weeks	3	60.0
Item 6: What effect does unsweetened fruit juice have on blood glucose? a. Lowers it b. Raises it c. Has no effect	1 1 1	20.0 20.0 20.0
Item 7: For a person in good control, what effect does exercise have on blood glucose? a. Lowers it	3	60.0
Item 8: Eating foods lower in fat decreases your risk for c. heart disease	3	60.0
Item 9: Which of the following is usually not associated with diabetes d. lung problems	3	60.0

The frequencies and percentages for the Diabetes Empowerment Scale item follow-up responses are displayed in Table 13. The participants tended to agree with the DES items and selected either *agree* or *strongly agree* on four of the items and *strongly agree* on two of the items. One participant selected *disagree* for three of the items, whereas the other two participants selected *strongly agree* for the three items.

Table 13

Frequencies and Percentages for Follow-Up Diabetes Empowerment Scale Items

	n	%
In general, I believe that I:		
...know what part(s) of taking care of my diabetes that I am satisfied with.		
Agree	1	20.0
Strongly Agree	1	20.0
...know what part(s) of taking care of my diabetes that I am dissatisfied with.		
Disagree	1	20.0
Strongly Agree	1	20.0
...know what part(s) of taking care of my diabetes that I am ready to change.		
Agree	1	20.0
Strongly Agree	1	20.0
...know what part(s) of taking care of my diabetes that I am not ready to change.		
Disagree	1	20.0
Strongly Agree	1	20.0

Table 13, continued

Frequencies and Percentages for Follow-Up Diabetes Empowerment Scale Items

	n	%
In general, I believe that I:		
...can tell how I'm feeling about having diabetes. Strongly Agree	2	40.0
...can tell how I'm feeling about caring for my diabetes. Agree	1	20.0
Strongly Agree	1	20.0
...know the ways that having diabetes causes stress in my life. Strongly Agree	2	40.0
...know the negative ways I cope with diabetes-related stress. Agree	1	20.0
Strongly Agree	1	20.0
...am able to figure out if it is worth my while to change how I take care of my diabetes. Disagree	1	20.0
Strongly Agree	1	20.0

Summary

The results from this study support the majority of the findings from other studies related to this topic and population. In addition, the results may have identified interpersonal influencers that could increase empowerment among participants. Areas

identified include resilience education and support group participation. Implications from these findings will be discussed in Chapter 5.

CHAPTER V

DISCUSSION

The primary purpose of this study was to assess whether a faith-based diabetes education program (ProjectPower) would significantly influence African Americans' knowledge, readiness to change, and feelings of empowerment about diabetes care. A secondary purpose of this study is to examine the ecological factors that may affect knowledge, readiness to change, and feelings of empowerment about diabetes care. Using the pre-test, intervention and post-test design, this study assessed knowledge, empowerment, and readiness to change. The study was conducted using a volunteer convenience sample of 48 participants who were recruited through three United Methodist churches in Houston, Texas beginning in June and through September 2008. The additional questions were guided by the Ecological Model, which proposes that people are affected by intrapersonal, interpersonal, community and policy influencers. The DKT and DES pre and post-test questions were guided by the Empowerment Theory and the Transtheoretical Theory also called the Stages of Change Theory.

Implications

The results and implications from the pre and post questions are discussed below. Results indicated that the diabetes knowledge test scores were significantly higher at the time of post-test compared with results at the time of pre-test, while neither the readiness-to-change scores nor the diabetes empowerment change scores were significantly

different between the pre-test and post-test. There was a significant trend between all the pre-test and post-test scores as participants who had higher scores on the pre-test tended to have higher scores on the post-test (see Table 14).

Table 14

Summary of Null Hypotheses: Rejected or Not Rejected

Null Hypothesis	Null Hypothesis Rejected or Not Rejected
Ho1: There is no significant difference between participants' pre-test diabetes knowledge scores and participants' post-test knowledge scores following the intervention.	Null Hypothesis Rejected
Ho2: There is no significant difference between participants' pre-test readiness to change scores and post-test readiness to change scores following the intervention.	Null Hypothesis Not Rejected
Ho3: There is no significant difference between participants' feelings of empowerment pre-test and post-test scores following the intervention	Null Hypothesis Not Rejected
Ho4: There will be no statistically significant difference in participants' post-test knowledge, readiness to change, and feelings of empowerment scores one-month after the intervention compared to the first post-test.	Null Hypothesis Not Rejected

Demographic characteristics of the sample were collected and described in Tables 1-4. The majority of the participants were female (79.2%), and 20.8% were males. The results of more female participation is similar to other studies (e.g., Hargreaves et al. (2002); Lach et al. (2004); Song et al. 2004) and others, and could be because women are

known to be the health seekers of the family (Giger et al., 2008). In contrast, the level of education and income were opposite of what other studies reported regarding the majority of female participants. For example, Giger et al. reported that the majority of their participants were single women with low income which is also in contrast with the results of this study.

Knowledge Test Scores

Frequencies and percentages were used to report the correct versus incorrect items on the DKT. ANOVA was used to determine the difference between DKT pre-test and post-test scores. The results showed that the diabetes knowledge test scores were significantly higher at the time of post-test than at the time of pre-test. Pearson's Product Moment correlations were used to determine the relationship between pre-test and post-test scores. There was also a significant relationship between the pre-test and post-test scores for the DKT scores. This indicates that participants who had higher scores on the pre-test tended to have higher scores on the post-test. It is evident that education does increase knowledge, but what is left to be known is what type of education works for those living with diabetes (Peyrot, 1999).

Empowerment Scores

ANOVA was used to determine the difference between diabetes empowerment pre-test and post-test scores. The diabetes empowerment change scores were not significantly different at the pre and post-test. This is similar to the study conducted by Anderson et al. (2005), where participants showed "small-to-modest" changes during a six-week program. On the other hand, this study is in contrast to the findings of

Steinhardt, Mamerow, Brown, and Jolly (2009). In their study with 16 African American men and women, the empowerment scores using the DES increased significantly from the time of pre and post-test when using a one-shot design.

Pearson's Product Moment analyses were used to determine the relationship between pre-test and post-test scores. There was a significant relationship between the pre-test and post-test scores for the diabetes empowerment scale. This indicates that participants who had higher scores on the pre-test tended to have higher scores on the post-test. These findings are consistent with other studies suggesting that patient empowered interventions lead to improved self-management behaviors (Ammerman et al., 2003; Blanchard et al., 1999).

Readiness to Change Scores

ANOVA was used to determine the difference between diabetes readiness to change scores on pre-test and post-test. The readiness to change scores were not significantly different at pre and post-test. These results are similar to those found by Wade (2005) in her study on ProjectPower. Although the Stages of Change Theory is most appropriate for research involving empowerment through education and social support (Prochaska et al., 1994), chronic behaviors, in particular, are changed in stages (Prochaska & Prochaska, 1999; Velicer et al., 1985). According to Highstein et al. (2007), readiness to change is difficult to measure because a person may be in one stage of change for physical activity and in another stage for dietary patterns. Furthermore, Parchman et al. (2003) found those who were diagnosed with diabetes within one year were more likely to advance in the Stages of Change for diet and exercise, but not for

self-monitoring of blood glucose (SMBG). According to Lach et al. (2004), knowledge programs help people in precontemplation and contemplation stages move into the action stage. Learning what they need to know helps change their attitudes (Lach, et al.).

Pearson's Product Moment analyses were used to determine the relationship between pre-test and post-test scores. There was a significant relationship between the pre-test and post-test scores for the readiness to change items. This indicates that participants who had higher scores on the pre-test tended to have higher scores on the post-test. Since these participants had higher scores to begin with, this may indicate that the participants were already in the action or maintenance stage. With further research, these participants may be able to be placed in stages by using grids similar to those used by Lach, Everard, Highstein, and Brownson (2004). In their study conducted with older adults, a grid was used to determine or place participants in stages. According to their grid, those in precontemplation and contemplation stages were those who needed information to raise awareness and increase knowledge. The grid was also successful in program planning efforts and could possibly be used to continue program planning efforts for ProjectPower. Self-management courses such as ProjectPower are classified as skill building efforts; so after attending the courses, participants could be moved to the maintenance stage by attending support groups, walking groups or ongoing exercise classes. Therefore, those attending the ProjectPower courses could be classified as being in the action stage.

One Month Follow-Up

At least 10 people agreed to participate in the one-month follow-up on the day they attended the ProjectPower workshop by providing the researcher with their email addresses. However, only three participants actually participated in the follow-up survey at the end of the data collection period. One reason for this low participation could stem from privacy concerns. According to Cho and LaRose (1999), although the Internet is perceived as being a viable way of conducting research, the response rates for participation are low. This may be because of privacy concerns (Cho & LaRose, 1999; Lyons, Cude, Lawrence & Gutter, 2005; O'Neil, 2001). A statement of risk to participants required by the TWU IRB, could have created some sense of suspicion among the participants: "Your submission of this survey signifies your informed consent to participate in this study. There is a potential risk of loss of confidentiality in all email, downloading, and Internet transactions." A second reason for low participation in the one-month follow-up was Hurricane Ike. The effects of Hurricane Ike could be felt beginning Friday September 12, 2008 at 11:00 p.m. through Saturday September 13, 2008 at 6:00 a.m. The Hurricane left millions without power, which prohibited access to the Internet (CenterPoint Energy, 2009) and scarce provisions of gasoline that prohibited travel for more than two weeks.

The one-month follow-up empowerment scores showed that when asked "know what part(s) of taking care of my diabetes that I am dissatisfied with," one participant selected "strongly agree," which indicates that this participant was still empowered and had not relapsed from the action stage after attending the workshop. Another participant

selected “disagree,” which could mean that the participant was not empowered after participating in the intervention and had moved out of the action stage after attending the workshop.

Ecological Assessment and Project Power

In addition to the close-ended survey questions, open-ended questions, rooted in the Ecological Model, were used to assess barriers to diabetes care and behavior change. The Ecological Model proposes that people are affected by intrapersonal, interpersonal, community and policy influencers. Based on this assumption, responses to the additional questions can be placed in categories as shown in Table 10. Although the responses to the open-ended questions were very brief, the intrapersonal influencers mainly guided the use of the model and the thoughts of participants in this study. One response related to the interpersonal influencer and several positive comments regarding the program itself were made.

Intrapersonal

When asked, *What factors impact your diabetes care (positive or negative)?* participants responded that food and exercise affected their diabetes. There was not enough information to determine if problems with food were because of family obligations as found in the study conducted by Hargreaves et al. (2002). They learned from a focus group of 40 African American women that environmental factors, such as “access to fast food, vending machines, food stores that are open at all hours every day, take-out, microwave ovens, affordable restaurants and well stocked grocery stores had an effect on eating habits” (p. 141). Robinson (2008) found culture, social traditions, and

role expectations impacted eating practices; and patterns within peer groups, friends and family” (p. 395). Anderson et al. (1996) found that changing these patterns was hard for participants, and Airhihenbuwa et al. (1996) were firm in their beliefs that “changes in food availability will need to take place before or parallel to individual changes” (p. 24). The responses regarding stress reported in this study were also reported by participants in the study conducted by Skelly et al. (2006) (i.e., not accurately testing sugar levels and concerns about the debilitating affects of the disease).

Interpersonal

When asked, *What are your concerns about the disease?* participants reported that there is a need for participation in diabetes support groups. Forty-four percent of the participants reported not participating in a support group. According to Lach et al. (2004), support groups are an effective way to help maintain diabetes care.

Community

According to Giger et al. (2008), the African American church is the center of the African American community and can be defined as organizational involvement. The church is also viewed as “a place where people can be trusted and a place where social support is received” (Giger et al., p. 375). For this reason, the ADA designed ProjectPower to be conducted through churches. When asked *What are your thoughts about faith-based diabetes education programs?*, participants reported they are very informative and worthwhile. When asked *What is your overall impression of ProjectPower?* participants reported that ProjectPower is an excellent or good and informative program. The positive responses about faith-based education programs and

ProjectPower could be because the church is viewed as a place where people can be trusted and a place where social support is received (Giger et al., p. 375).

Policy

A unique comment received by one participant in the one-month follow up was “that information gets out about the disease and the physicians give proper information.” This problem could be addressed by those developing the Healthy People 2020 program. Programs that focus on dissemination of information could be implemented.

Limitations

The results of this study should be considered in light of several limitations. First, this study used a volunteer convenience sample of 48 participants recruited from June through September 2008. Studies that allow for more recruitment time could achieve a larger sample size. Second, the volunteer sample only included African Americans living in Houston/Harris County and surrounding areas; hence, program outcomes cannot be generalized to the entire African American U.S. population. Third, while every effort was made to include the widest possible audience within this group, there is no way to guarantee that those participating in this research accurately represent the knowledge, empowerment and readiness to change for all African Americans, especially when other demographic variables such as education are considered. Over half or 56.3% of those participating had earned a Bachelor’s degree or higher. A more general population would not have had this many college graduates. During the time the survey was conducted, summer school was in session, which prohibited the opportunity to reach a large number of college students.

Furthermore, economic issues such as high gas prices of approximately \$4.00 per gallon prohibited individuals in Houston from making the extra trips they may have wanted to make. Fourth, Houston experienced one of the major hurricanes in history. Hurricane Ike hit the Houston area on September 13, 2008. The aftermath left the city devastated and left people with many needs such as water, shelter, and access to internet or phone services (United Way of Greater Houston, 2008). Therefore, recruitment efforts were halted after the storm. Fifth, the ProjectPower program was conducted using a volunteer convenience sample of participants from three United Methodist churches in Houston; hence, the ProjectPower program outcomes cannot be generalized to one particular church denomination. Sixth, this study does not control for the threats of history or the school bus effect, which may impact post-test results. Historical events that take place the same time as the intervention or gaining knowledge from others during the intervention are threats to internal validity (McDermott & Sarvela, 1999). During the time of the study, Kraft Foods visited two of the churches to conduct diabetes education and healthy eating demonstrations. Seventh, the improved knowledge scores were encouraging; and if given time, people may begin to feel more empowered. However, moving from one stage to another can take time—possibly even months or years—so finding no significant change in empowerment and readiness to change should come as no surprise. Last, the study is limited to the adult learners fully understanding the instructions and completing each instrument to the best of their ability.

Future Research

Several recommendations for future research based on previous studies and this study are recommended. Future research efforts should focus on the adult learner (Walker, 1999), instruments to measure interventions, long-term research that can prove the effectiveness of the use of short-term programs in churches for both men and women (Rickheim et al., 2002) and research that includes a control group (Kim et al., 2008). Although long-term programs have shown to be effective, this type of intervention would be hard for churches to replicate and would require additional funding. Studies have shown that pastors want involvement in sessions that require little paper work (Ammerman et al., 2003). According to Leonard et al. (2004) quality instruments are needed to capture the effects or intermediate outcomes of interventions. The Diabetes Knowledge Test (DKT) used in this study has been used in studies that recruited a variety of participants. Although the instrument can be matched to diabetes education programs to measure knowledge, quality instruments that measure diabetes education programs in 2008 are needed. The reliability and validity of the DKT was tested in 1998 (Fitzgerald et al., 1998).

It is evident that education does increase knowledge but what is left to be known is what type of education works for those living with diabetes (Peyrot, 1999). This study and others can lay the groundwork for larger-scale randomized controlled trials that will require substantial funding. The results of the study show that diabetes health education programs, developed by the ADA to be conducted through churches, can increase knowledge when conducted in 45 minutes. As found in this study, the reported need for

shorter, effective interventions that minimize time and paperwork coincides with pastors' desires mentioned in previous studies (Ammerman et al., 2003; Blanchard et al., 1999). What is left to be known is how much time is needed to increase empowerment and readiness to change among participants. Research that includes resilience education and support groups may be able to measure how much time needs to be added to increase empowerment and readiness to change among participants. And finally, research that includes a control group would better determine if participants' knowledge increase was a true result of the program.

Conclusion

The results of this study can contribute to the limited body of knowledge on diabetes education programs conducted in Houston, Texas. The current study was conducted in three churches in Houston/Harris County. The results can be used to refine the current process used by the ADA. Sessions were held for 95 minutes, which included taking of pre-test, participating in three ProjectPower education sessions and taking the post-test. The three ProjectPower education sessions were conducted in 45 minutes. The results showed that participants' knowledge increased significantly from pre to post-test. The results can also be used to modify the curriculum that is currently being used by the ADA to implement programs in churches. Although the results of this study cannot be generalized, education does seem to have a significant impact on diabetes knowledge. With increased funding and more volunteers, program planning efforts that include additional components such as resilience education (Steinhardt et al., 2009) support groups, regular exercise classes and walking clubs could be added to help individuals

manage their diabetes self-management care (Lach et al., 2004). These additional components to the ProjectPower program to increase empowerment in a cultural environment can, according to Airhihenbuwa, (1995) “be effective tools that enrich the production and acquisition of knowledge for interventionists and their audiences” (Airhihenbuwa, 1995, p. 108).

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APPENDIX A
Flyer for Distribution

Appendix A
Flyer for Distribution

FREE HEALTH EDUCATION OPPORTUNITY!!
DIABETES WORKSHOP AND EVALUATION



Seeking African American males and females 18 years and older to participate in a diabetes education workshop called ProjectPower and a study evaluating the effectiveness of ProjectPower on participants' knowledge, empowerment and readiness to change.

The study will consist of three parts; pre-test, workshop and post-test. (2.) Total time commitment: 95 minutes

Pre-test

Consent Letter and Demographic sheet – 5 minutes

Pre-test (Diabetes Knowledge Test) - 10 minutes

Pre-test (Diabetes Readiness to Change Scale) – 10 minutes

Education Session – 45 minutes

The program consists of three modules: General Diabetes Knowledge, O'Taste and See and Fit for the Masters Use.

Post-test

Post-test (Diabetes Knowledge Test) - 10 minutes

Post-test (Diabetes Readiness to Change Scale) – 10 minutes

Post-test (Additional Questionnaire) – 5 minutes

One-month follow-up survey by phone or by email – 20 minutes

There is a potential risk of loss of confidentiality in all email, downloading and internet activities.)

Diabetes Knowledge Test - 10 minutes

Diabetes Readiness to Change Scale – 10 minutes

Volunteers meeting the following criteria are welcome to participate:

African Americans ages of 18 years and older

Ability to read, write and speak English

Male or female

With or without type 2 diabetes

For more information or to sign up, contact (Church Representative) at (Church Location) or Sherry Grover, Principal Investigator. You will be asked to sign up using a participant code that only you can identify for the initial workshop. An email address is needed for the one month follow-up. There is a potential risk of loss of confidentiality in all email, downloading, and internet transactions.

Sherry Grover, Principal Investigator - Phone:

Dr. Jody Early, Advisor - Phone:

Location:

There will be snacks, door prizes and giveaways

APPENDIX B

Script for Church TV and Bulletins

Appendix B
Script for Church TV and Bulletins

Come learn how to take the POWER back from diabetes. Come out on (date/time/location) to learn more about DIABETES and how to prosper in health. To register for this free workshop/ study and for more information call (insert name and phone number). Brought to you by (church ministry)

Our bodies are temples! Come out on (date/time/location) to learn more about DIABETES and how to keep our temples “fit for the master’s use”. To register for this free workshop/study and for more information call (insert name and phone number). Brought to you by (church ministry)

O taste and see” that the LORD is good! Come out for this fun and interactive workshop on (date/time/location). You will learn about the importance of healthy eating for everyone and especially those with diabetes. You will also learn how to select prepare healthy foods for you and your family. To register for this free workshop/study and for more information call insert name and phone number). Brought to you by (church ministry)

APPENDIX C

Script for Praise 92.1

Appendix C

SCRIPT FOR PRAISE 92.1

(50 word limit)

DIABETES WORKSHOP AND PROGRAM EVALUATION (Health and Safety)

Location: Your church location or TBA

Do you or any member of your family live with type 2 diabetes? Volunteers with or without type 2 diabetes are needed to take part in a study examining the ADA's ProjectPower program, and your help is greatly needed! ProjectPower is a church-based program that educates people about diabetes and includes information relating to healthy eating, exercise, and diabetes prevention and management. Please contact Sherry Grover at

APPENDIX D

Workshop Modules

Appendix D

Workshop Modules

Workshops will be conducted on three modules of the American Diabetes Association's ProjectPower program.

Module 1 – Fit for the Master's Use

In this module, participants learn the definition of diabetes and pre-diabetes. This module increases awareness of why physical activity is important, introduces different forms of exercise, provides suggestions for getting started and increases awareness of the healthcare provider's role.

Module 2 – O Taste and See

The purpose of this module is to increase awareness of why eating healthy is important, increase awareness on how to prepare and cook food more healthfully and identify ways to eat more healthy foods.

Module 3 – Diabetes Day & Power Over Diabetes

In this module, risk factors are introduced and the importance of good diabetes care is introduced.

APPENDIX E

Cover Letter

Appendix E
Cover Letter

April 29, 2008

Dear Community Members:

You are invited to participate in a diabetes education workshop and research study evaluating the effectiveness of the workshop. The entire workshop and study will last for 95 minutes.

If you choose to participate, you will be asked to provide information on your knowledge of diabetes before and after the workshop. The information will be collected in the form of a questionnaire. Completing the questionnaires is voluntary and you are not required to provide identifying information. You may attend the workshop without completing questionnaires and you may withdraw from the research study at any time without any penalty.

If you have questions about the workshop and study evaluating the effectiveness of the workshop, please contact:

Investigator: Sherry Grover
Advisor: Jody Early, PhD.....

Thanks in advance for your consideration.

Sincerely,

Sherry Grover
Investigator

APPENDIX F

Demographic Sheet Pre-Test

Appendix F
Pre-test/Post-test
Demographic Sheet

Participant Code _____

Please answer the following questions by placing an (X) on the line next to your answer or by writing your answer in the blank space.

1. Sex: Male _____ Female _____

2. How old are you? _____ years old

3. Marital Status: Married _____ Divorce _____ Single _____ Other _____

4. How many children do you have? _____

5. Have you been told by a doctor that you have diabetes? Yes _____ No _____

6. How long ago were you told by a doctor that you had diabetes? _____ years

7. Have you ever attended a diabetes education program? Yes _____ No _____
(If "Yes", how many years ago? _____)

8. How much schooling have you completed?
8th grade or less _____ Some high school _____

High school graduate _____ Some college or technical school _____

Bachelor's degree or higher _____

9. Do you exercise? Yes _____ No _____
(If "Yes", how many days of the week do you exercise?) _____ days
(If "Yes", how long?) _____ minutes per day

10. Do you examine your feet? Yes _____ No _____

11. Are you a member of a diabetes support group? Yes _____ No _____

12. Total Annual Household Income:
\$0 - \$14,999 _____ \$15,000 - \$29,999 _____
\$30,000 - \$44,999 _____ \$45,000+ _____

13. What is your height? _____ feet _____ inches

14. What is your weight? _____ pounds

Wade, 2005

APPENDIX G

Diabetes Knowledge Pre-Test for ProjectPower

Appendix G

Diabetes Knowledge Pre-test for ProjectPower

Participant Code _____

Please circle the correct answer

1. The diabetes diet is: a. the way most American people eat b. a healthy diet for most people c. too high in carbohydrate for most people d. too high in protein for most people 2. Which of the following is highest in carbohydrate? a. Baked chicken b. Swiss cheese c. Baked potato d. Peanut butter 3. Which of the following is highest in fat? a. Low-fat milk b. Orange juice c. Corn d. Honey 4. Which of the following is a "free food"? a. Any unsweetened food b. Any dietetic food c. Any food that says "sugar free" on the label d. Any food that has less than 20 calories per serving 5. Glycosylated hemoglobin (hemoglobin A1) is a test that is a measure of your average blood glucose level for the past: a. day b. week c. 6-10 weeks d. 6 months 6. What effect does unsweetened fruit juice have on blood glucose? a. Lowers it b. Raises it c. Has no effect	7. For a person in good control, what effect does exercise have on blood glucose? a. Lowers it b. Raises it c. Has no effect 8. Eating foods lower in fat decreases your risk for: a. nerve disease b. kidney disease c. heart disease d. eye disease 9. Which of the following is usually <u>not</u> associated with diabetes: a. vision problems b. kidney problems c. nerve problems d. lung problems DKT; Diabetes Research and Training Center © University of Michigan, 1998
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APPENDIX H

Pre-Test – Attitudes Towards Diabetes (DES)

Appendix H
(Pre-test/Post-test)
Attitudes Toward Diabetes – DES
(For those with diabetes)

Participant Code _____

Please place a check mark in the space that describes your response.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
In general, I believe that I:					
1. ...know what part(s) of taking care of my diabetes that I am satisfied with.	()	()	()	()	()
2. ...know what part(s) of taking care of my diabetes that I am dissatisfied with.	()	()	()	()	()
3. ...know what part(s) of taking care of my diabetes that I am ready to change.	()	()	()	()	()
4. ...know what part(s) of taking care of my diabetes that I am <u>not</u> ready to change.	()	()	()	()	()
5. ...can tell how I'm feeling about having diabetes.	()	()	()	()	()
6. ...can tell how I'm feeling about caring for my diabetes	()	()	()	()	()
7. ...know the ways that having diabetes causes stress in my life.	()	()	()	()	()
In general, I believe that I:					
8. ...know the negative ways I cope with diabetes-related stress.	()	()	()	()	()
9. ...am able to figure out if it is worth my while to change how I take care of my diabetes.	()	()	()	()	()

Thank you very much for completing this questionnaire.

APPENDIX I

Additional Questionnaire Post-test

Appendix I

(Post-test)

Additional Questionnaire

Your submission of this survey signifies your informed consent to participate in this study. There is a potential risk of loss of confidentiality in all email, downloading, and internet transactions.

Participant Code _____

Please write your response in the space below the appropriate question.

Additional questions for those with diabetes

1. What are your thoughts about type 2 diabetes?
2. What factors impact your diabetes care (positive or negative)?
3. What are your concerns about the disease?
4. What are your thoughts about faith-based diabetes education programs?
5. What is your overall impression of ProjectPower?

Additional questions for those without diabetes

1. What are your thoughts about faith-based diabetes education programs?
2. What is your overall impression of ProjectPower?

Post –test Contact Information:

If you would like to participate in a post-test follow-up, please include an email.

Email: _____

APPENDIX J

Consent to Participate

APPENDIX J
TEXAS WOMAN'S UNIVERSITY
CONSENT TO PARTICIPATE

TITLE OF STUDY: THE EFFECTS OF PROJECTPOWER DIABETES EDUCATION PROGRAM ON ADULT AFRICAN AMERICANS' DIABETES KNOWLEDGE, EMPOWERMENT, AND READINESS TO CHANGE

Investigator: Sherry Grover, MBA
Advisor: Jody Early, PhD.....

PURPOSE: The purpose of this study is to assess whether a faith-based diabetes education program (ProjectPower) will significantly impact African American's knowledge, readiness to change, and feelings of self efficacy about diabetes care. This study will also assess the ecological factors that may affect knowledge, readiness to change, and feelings of self efficacy about diabetes care.

DURATION: The maximum total time commitment for the participants involved is 95 minutes. The maximum total time commitment for the participants involved in the one-month follow-up is 20 minutes.

PROCEDURES: Following IRB approval, volunteers will be recruited through

At the beginning of each workshop, the investigator will welcome and thank each participant for participating (Appendix J). Each participant will be given a two-pocket folder with the consent letter and written informed consent form on the left side and with the demographic sheet and pre-test on the right side. Colored paper will be used to distinguish between pre-test and post-test. The researcher will review the consent form with the participants, and the participants will have the opportunity to ask the researcher questions about the study and can choose to quit at any time. The Investigator will instruct the group to print a number (only identifiable to the participant) on the participant code line of each form. The Investigator will remain in the room while participants complete the instruments. Anticipated time to complete the consent letter, demographic sheet, and pre-test is 25 minutes. The investigator will complete the education session, in approximately 45 minutes. Upon completion of the session, the post-test will be distributed for completion. Anticipated completion time for post-test is 25 minutes. The Investigator will again instruct the group to insert the same participant code used on the pre-test on the post-test. Any participant attending the workshop that is not willing to complete the questionnaires will be allowed to complete the workshop and submit a blank questionnaire. The Investigator will collect all documents and thank the participants for their time.

Participant Initials _____
Page 1 of 2

The post-test survey will ask participants if they would be willing to participate in a 1-month follow-up survey by email. Participants who choose to participate in the one-month follow up will complete an electronic survey hosted by Psychdata.com. Participants who volunteer for this portion of the study will provide the researcher with an email address that the researcher may use to send out the hyperlink to the electronic survey one month after the intervention. They will not be asked to include their names, only an email address.

POSSIBLE RISKS/DISCOMFORTS: There is a potential risk of being inconvenienced with the total time required to complete pre-test and post-test surveys and to participate in diabetes education workshops. Participants will be awarded with door prizes as a compensation for time. The class itself is free and is educational.

There is a risk of loss of anonymity. Information will remain confidential but others may know you are participating in this study since the surveys are not completed in private. There may be a risk of discomfort if the questions are perceived as sensitive. Participants can stop participating at any time. There is a risk of loss of confidentiality. To minimize the risk, participants do not need to add their names and the data will be stored securely and viewed only by the researcher and her advisor, Dr. Early. Completed documents will be stored in a locked file cabinet and will be destroyed after one year. There is a potential risk of loss of confidentiality in all email, downloading and internet activities. One-month follow-up will be conducted using PsychData. PsychData is an online survey that has the capability for participants to complete surveys anonymously. The services for the system are in-house which allows the servers to be monitored 24/7. Please note, results of this study may be published or presented. However, participants will never be named and their personal rights and privacy will always be maintained.

The researchers will try to prevent any problem that could happen because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

VOLUNTARY PARTICIPATION: Participation in the workshop and pre-test/post-test survey are 100% voluntary. Choosing to participate does not obligate you to provide any feedback or answer any questions you are not comfortable with. Please know that you may stop at any time without penalty.

POSSIBLE BENEFITS: Your participation helps support the research practices of the researcher and Texas Woman's University. In addition, this information provides feedback on issues faced by members of this culture diagnosed with diabetes and diabetes education programs. Small giveaways and door prizes will be given away. *The only direct benefit of this study to you is that at the completion of the study a summary of the results will be mailed to you upon request.

QUESTIONS REGARDING THE STUDY

If you have any questions about the research study you may ask the researchers; their phone numbers are at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman's University

Office of Research and Sponsored Programs at 940-898-3378 or via e-mail at IRB@twu.edu. You will be given a copy of this signed and dated consent form to keep.

Signature of Participant

Date

*If you would like to receive a summary of the results of this study, please provide an address to which the summary should be sent.

Thank you for your time and participation!

APPENDIX K
Script for Participants

Appendix K

Script for Participants

Church representative will introduce Investigator by giving name, school and name of project.

Script for Investigator:

Hello everyone,

Thank each of you for volunteering to participate in this workshop and study. Hosea 4:6. says "My people perish because of a lack of knowledge." The purpose of this workshop is to increase your knowledge about diabetes. You will be given a pre-test containing demographics, knowledge and attitude questions. It should take you about 25 minutes to complete the questions. Once completed, we will begin the workshop over three modules which include the Diabetes day module, Fit for the Masters Use and O'Taste and See modules. It should take about 45 minutes to complete the modules. Once completed, you will take a post-test over the same knowledge, attitude and additional questions. This should take another 25 minutes. The entire session will take about 95 minutes. I will pause during the process to answer any questions.

APPENDIX L

Diabetes Knowledge Post-test for ProjectPower

Appendix L

Diabetes Knowledge Post-test for ProjectPower

Your submission of this survey signifies your informed consent to participate in this study. There is a potential risk of loss of confidentiality in all email, downloading, and internet transactions.

Participant Code _____

Please circle the correct answer

1. The diabetes diet is: a. the way most American people eat b. a healthy diet for most people c. too high in carbohydrate for most people d. too high in protein for most people 2. Which of the following is highest in carbohydrate? a. Baked chicken b. Swiss cheese c. Baked potato d. Peanut butter 3. Which of the following is highest in fat? a. Low-fat milk b. Orange juice c. Corn d. Honey 4. Which of the following is a “free food”? a. Any unsweetened food b. Any dietetic food c. Any food that says “sugar free” on the label d. Any food that has less than 20 calories per serving 5. Glycosylated hemoglobin (hemoglobin A1) is a test that is a measure of your average blood glucose level for the past: a. day b. week c. 6-10 weeks d. 6 months 6. What effect does unsweetened fruit juice have on blood glucose? a. Lowers it b. Raises it c. Has no effect	7. For a person in good control, what effect does exercise have on blood glucose? a. Lowers it b. Raises it c. Has no effect 8. Eating foods lower in fat decreases your risk for: a. nerve disease b. kidney disease c. heart disease d. eye disease 9. Which of the following is usually <u>not</u> associated with diabetes: a. vision problems b. kidney problems c. nerve problems d. lung problems DKT; Diabetes Research and Training Center © University of Michigan, 1998
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APPENDIX M

Post-Test – Attitudes Towards Diabetes (DES)

Appendix M
Post-Test
Attitudes Toward Diabetes – DES
(For those with diabetes)

Your submission of this survey signifies your informed consent to participate in this study. There is a potential risk of loss of confidentiality in all email, downloading, and internet transactions.

Participant Code _____

Please place a check mark in the space that describes your response.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
In general, I believe that I:					
1. ...know what part(s) of taking care of my diabetes that I am satisfied with.	()	()	()	()	()
2. ...know what part(s) of taking care of my diabetes that I am dissatisfied with.	()	()	()	()	()
3. ...know what part(s) of taking care of my diabetes that I am ready to change.	()	()	()	()	()
4. ...know what part(s) of taking care of my diabetes that I am <u>not</u> ready to change.	()	()	()	()	()
5. ...can tell how I'm feeling about having diabetes.	()	()	()	()	()
6. ...can tell how I'm feeling about caring for my diabetes	()	()	()	()	()
7. ...know the ways that having diabetes causes stress in my life.	()	()	()	()	()
8. ...know the negative ways I cope with diabetes-related stress.	()	()	()	()	()
9. ...am able to figure out if it is worth my while to change how I take care of my diabetes.	()	()	()	()	()

Thank you very much for completing this questionnaire.
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