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Diabetes Self Care Behaviors and Social Support Among African Americans in San Francisco

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Walden University
2017

Abstract

Diabetes Self-Care Behaviors and Social Support Among African Americans in San

Francisco

by

Liseli Mulala

MPH, San Francisco State University, 2013

BSc, Northeastern University, 1994

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Walden University

June 2017

Abstract

Both Type 1 and Type 2 diabetes are significant public health issues that affect people of all races; Type 2 diabetes disproportionately affects African Americans with higher diagnosis, morbidity, and mortality than it affects Caucasians, and Type 1 has been increasing in incidence. Diabetes self-care activities (DSCAs) and social support have been shown to help in managing both types, which can reduce morbidity and mortality. African Americans with diabetes in San Francisco have higher rates of complications, hospitalizations, and emergency room visits secondary to diabetes. This study assessed whether a relationship exists between emotional support, practical support, affirmational support, informational support, and self-care behaviors. This cross-sectional study was guided by the health belief model and social cognitive theory and was conducted using the Summary of Diabetes Self Care Activities (SDSCA) and the Social Support Survey Instrument. The median SDSCA score for performance of diabetes self-care activities was 32. The Spearman correlation between informational support and the SDSCA score was positively statistically significant ($p < .002$), and the affectionate support score was also positively correlated with the SDSCA score ($p < .0001$). The emotional support and the practical/tangible support scores were negatively correlated to the SDSCA score, but the correlation was not statistically significant. The results of this study may help to effect social change by encouraging provision of informational support with diabetes self-management education and affectionate support by including family and friends in their care process. This provision could lead to improvement in DSCAs and reduction of hospitalizations and emergency room visits among African Americans.

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Dedication

For my daughter Linnani, without whom none of this would be possible, and for her patience, love, and support throughout this process. For my family, friends, and all the people around the world suffering with diabetes.

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I would like to thank the Lord God, Dr. Vasileios Margaritis, Dr. Naa-Solo Tettey, Dr. Gudeta Fufaa, Dr. Jirina Foltysova, Dr. Shari Jorissen, Michael Miller, Dr. Jeffrey Wong, and my mother, Kekelwa Dall.

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Chapter 1: Introduction to the Study

Introduction

Diabetes has affected people all over the world, at all ages and in all walks of life (International Diabetes Federation [IDF], 2014, Centers for Disease Control and Prevention [CDC], 2014). Diabetes as a chronic disease has been separated into four classifications: Type 1 diabetes, Type 2 diabetes, gestational diabetes, and diabetes secondary to another disease or medication (American Diabetes Association [ADA], 2015). Autoimmune-based beta-cell destruction that has led to almost complete insulin deficiency causes Type 1 diabetes (ADA, 2015). When resistance to the insulin action in the body occurs,, despite having insulin present, the body cannot use the hormone effectively, causing Type 2 diabetes (ADA, 2015). Those with gestational diabetes develop excessively high levels of blood sugar and resistance secondary to being pregnant, and the last type of diabetes listed is when a disease or medication reduces insulin production in the body or increases insulin resistance (ADA, 2015).

Diabetes disproportionately affects African Americans, with 13.1% prevalence compared with 7.6% among Caucasians in the United States, and, in San Francisco, 15.8% among African Americans compared with 1.2% among Caucasians (CDC, 2014). Overall, 10% of those with diabetes had Type 1 but African American youth aged 10 to 19 years had an incidence of 15.7 per 100,000 (Mayer-Davis et al., 2009). African American youth with Type 1 diabetes have been shown to have a higher likelihood of obesity and complications (Mayer-Davis et al., 2009). African Americans in San Francisco had higher rates of hospitalizations and emergency room (ER) visits secondary

to complications from both Type 1 and Type 2 diabetes, such as amputations, end-stage kidney disease, and morbidity and mortality (Chow et al., 2012; San Francisco Health Improvement Partnership [SFHIP], 2015).

For the rest of this dissertation, when I refer to *diabetes*, I am indicating both Type 1 and Type 2 diabetes, unless otherwise specified. Adherence to diabetes self-care activities (DSCAs) has been shown to help improve diabetes management and reduce morbidity, mortality, and complications from the disease (Haas et al., 2014). Increased levels of social support have been shown to improve adherence to specific self-care behaviors such as healthy diet, physical activity, and checking feet (Rosland et al., 2014; Strom & Egede, 2013). Effects on other behaviors such as adherence to medications, checking blood sugar, adherence to medical appointments, risk reduction, and problem solving have been variable (Rosland et. al., 2014).

African Americans with diabetes have been shown to suffer disproportionately from higher levels of morbidity and mortality from this disease than Caucasians do (Chow et al., 2012; Mayer-Davis et al., 2009; SFHIP, 2015). Assessing whether a relationship exists between social support and performance of diabetes self-care behaviors may provide a novel avenue for interventions. A positively predictive relationship may promote interventions that could lead to increased levels of social support to indirectly increase levels of and adherence to diabetes self-care behaviors (Tang et al., 2008). This, in turn, could lead to a reduction in complications, hospitalizations, and ER visits as well as a reduction in morbidity and mortality from diabetes among African Americans in San Francisco.

Background

Diabetes in San Francisco overall has been measured at a lower level than the nationwide or statewide average (CDC, 2014; Conroy, Lee, Pendleton, & Bates, 2014; SFHIP, 2015). The nationwide rate was measured at 9.3%, the statewide rate at 8.4%, and the San Francisco rate at 4%, but when broken down by race, the rate among African Americans was 13.1% nationally, 8.8% in California, and 15.8% in San Francisco (CDC, 2014; Conroy et al., 2014; SFHIP, 2015). African Americans have been disproportionately affected by complications from diabetes and in San Francisco (SFHIP, 2015).They have had higher rates of hospitalizations secondary to diabetes and complications from diabetes and higher ER visitation rates due to diabetes and complications from diabetes (SFHIP, 2015).

Social support has a positively predictive relationship with adherence to the diabetes self-care behaviors of physical activity, healthy diet, and checking of feet (Rosland et al., 2014; Tang et al., 2008). Adherence to diabetes self-care behaviors reduces complications from diabetes and this could lead to a reduction in hospitalizations and ER visits due to diabetes and complications from diabetes (Haas et al., 2014; Strom & Egede, 2013). With this study, I assessed the perceived levels of emotional, practical, affectionate, and informational social support using the MOS Social Support Survey Instrument (SSSI) and the levels of adherence to DSCAs as measured by the Summary of Diabetes Self-Care Activities (SDSCA) (Moser et al., 2014; Schmitt et al., 2013; Sherbourne & Stewart, 1991; Toobert, Hampson, & Glasgow, 2000).

According to previous studies, a relationship has been found between social support as a composite score and DSCAs, as opposed to individual levels of functional social support like emotional support, tangible support, affectionate or affirmational support, and informational support and diabetes self-care behaviors (Rosland et al., 2014; Tang et al., 2008; Watkins et al., 2013). Few studies have focused exclusively on the effect of social support in African Americans, and a lack of studies have focused on the differential effects for emotional, affectionate, informational, and tangible support on DSCAs (Tang et al., 2008; Watkins et al., 2013). Most studies have concentrated on participants with Type 2 diabetes, and few have done research on Type 1 diabetes, but social support has been shown to be related to DSCAs in both Type 1 and Type 2 diabetes (Rosland et al., 2014; Rankin et al., 2014; Watkins et al., 2013).

A recent study on diabetes and social support by Rosland et.al (2014) used data from the Diabetes Study of Northern California (DISTANCE). This study was not focused specifically on African Americans but this ethnic group made up 18% of the study sample and, according to the results, a relationship between social support and physical activity, healthy diet, and checking of feet was revealed with no difference in effect based on race/ethnicity (Rosland et al., 2014). Rosland et al. (2014) included a composite score for social support, which asked only about social support in general but did not analyze the individual forms of social support and the differentiated effect of each type on each diabetes self-care behavior (Tang et al., 2008). *Social support* is often defined as the support that is received from a social network to manage stress, disease, or trauma (Heaney & Israel, 2008).

I assessed whether a differential relationship exists between the four types of social support (emotional, informational, affectionate, and tangible) as measured on the SSSI and the seven diabetes self-care behaviors as measured by the SDSCA score (American Association of Diabetes Educators [AADE], 2015; Sherbourne & Stewart, 1991; Tang et al., 2008).

Problem Statement

Diabetes as a chronic disease affected one in 12 people worldwide in 2014 and one in 11 people in the United States; in California, the proportion decreased to one in 12 again, and San Francisco had a rate of only one in 25 (CDC, 2014; IDF, 2014; Conroy et al., 2014; SFHIP, 2015). But as with the rest of the nation, in California and San Francisco, African Americans were disproportionately affected by this particular chronic disease and had increased morbidity and mortality from diabetes (CDC, 2014; Chow et al., 2012; Conroy et al., 2014; SFHIP, 2015).

In San Francisco, African Americans had a 15.8% rate of diabetes compared with an 8.8% rate for African Americans in California and 13.1% in the United States (CDC, 2014; Conroy et al., 2014; SFHIP, 2015). African Americans had higher rates of ER visits and hospital admissions due to diabetes and complications from diabetes, compared with other racial groups in San Francisco (SFHIP, 2015). This health disparity among African Americans has resulted in higher levels of mortality and morbidity due to diabetes and the rate of death that is actually due to diabetes is probably under reported (Chow et al., 2012; Nichols, 2012). Many death certificates do not mention that the patient had diabetes, and with diabetes being a major risk factor for cardiovascular

disease (CVD) and stroke, many patients who died from CVD and stroke may have suffered this mortal blow secondary to diabetes (Chow et al., 2012; Nichols, 2012).

The data from 2012 showed that people with diabetes had a CVD death rate of 5.6 per 1,000 person years compared with 3.7 to 3.3 per 1,000 person years in people who did not have diabetes (Nichols, 2012). The difference in the all-cause mortality rate between people with diabetes and people without diabetes was 6.1 per 1,000 person years, with rates being higher for diabetes (Nichols, 2012).

Performance of the seven recommended diabetes self-care behaviors 5 or more days per week has been shown to improve glycemic control and reduce complications and hospitalizations (Courtemanche et al., 2012; Haas et al., 2014). Social support directly affects performance of certain diabetes self-care behaviors, but no studies had been conducted on individual types of social support and their differential effects on the seven recommended diabetes self-care behaviors (Tang et al., 2008). The different types of social support catalogued were emotional, tangible, affectionate, and informational (Moser et al., 2013; Sherbourne & Stewart, 1991; Tang et al., 2008). The seven recommended diabetes self-care behaviors investigated were healthy eating, physical activity, checking blood sugar, diabetes-related risk reduction, diabetes-related healthy coping, medication adherence, and diabetes-related problem solving (AADE, 2015).

An assessment of the perceptions of emotional, informational, affectionate, and tangible levels of social support as well as performance of DSCAs showed what supports and behaviors were lacking. With this information, targeted interventions could be created focused on African Americans to try and fill those gaps and potentially improve

self-care behaviors and, in time, potentially reduce complications and hospitalizations. With the established health disparities among African Americans regarding diabetes diagnosis, such a plan of assessing gaps and creating targeted interventions could be applied to African Americans with diabetes in other urban areas (Chow et al., 2012). Reducing this disparity would be a step toward moving the country closer to achieving the Healthy People 2020 goal of reducing the economic and disease burden of diabetes and improving the quality of life of all people with diabetes (Healthy People 2020).

Purpose of the Study

This was a quantitative study, the purpose of which was to assess whether a relationship exists between perceived levels of emotional, informational, affectionate, and tangible support and the seven recommended diabetes self-care behaviors (Mulala, 2015). Multivariate analyses were performed with the covariates of age, income, marital status, and educational level (Field, 2013). Section I and V of the Diabetes Care Profile (DCP) included demographic information and additional social support questions, and I asked participants to fill this out as well as the SDSCA and SSSI (Fitzgerald et al., 1991; Mulala, 2015). The levels of emotional, tangible, affectionate, and informational support, as measured on the SSSI, were the independent variables (Field, 2013; Moser et al., 2013; Tang et al., 2008). The diabetes self-care behaviors of healthy eating, physical activity, medication adherence, problem solving, healthy coping, risk reduction, and checking blood sugar as measured by the SDSCA score was the dependent variable (AADE, 2015; Toobert et al., 2000).

Research Questions and Hypothesis

I addressed the following research questions:

1. What is the rate of individual diabetes related self-care behaviors being performed in this sample of African Americans in San Francisco based on the SDSCA survey?

2. What is the level of perceived emotional, tangible, informational and affectionate support as measured on the SSSI survey?

3. What is the relationship between the score for individual DSCAs as measured on the SDSCA survey and the scores of emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco adjusted for the demographic variables of age, gender, income and educational level?

I hypothesized that there would be two possible results from the proposed research study:

H_0: There is no relationship between the scores for individual DSCAs as measured by the SDSCA and the scores for emotional, tangible, affectionate and informational support as measured on the SSSI survey in African Americans with diabetes in San Francisco.

H_1: There is a relationship between the scores for individual DSCAs as measured by the SDSCA and the scores for emotional, tangible, affectionate and informational support as measured on the SSSI survey in African Americans with diabetes in San Francisco.

Theoretical Framework

The theoretical framework for this study was based on three theories: health belief model (HBM), social cognitive theory (SCT), and community-based participatory research theory [CBPR] (Glanz & Bishop, 2010; Minkler, 2013). The HBM was created in the 1950s to help departments of public health understand why people did or did not use provided preventative services (Glanz & Bishop, 2010; Rosenstock, 1974). The main precepts of the HBM are that people make decisions on whether or not they will participate in a preventative health program or activities based on the beliefs that they have about aspects of the disease or condition (Glanz & Bishop, 2010). The precepts of perceived severity, perceived susceptibility, perceived benefits, perceived barriers, cues to action, and self-efficacy are the backbone of the HBM (Glanz & Bishop, 2010). The HBM was relevant to my study because it has been used to assess patient's readiness and self-efficacy to be able to successfully perform the recommended DSCAs (Jalillian, Zinat- Motliagh, Solhi, & Gharibnavaz, 2014). Patients must believe certain things to effectively manage their diabetes. First they must believe that they are susceptible to diabetes and can suffer from severe complications from diabetes (Jalillian et al., 2014). They must also believe that the performance of self-care behaviors will benefit diabetes management and that there are minimal barriers to performance (Jalillian et al.,2014). Lastly, if people have cues to action to maintain performance and the self-efficacy to do so, they will do a better job of managing their diabetes overall (Glanz & Bishop, 2010; Jalillian et al., 2014). Jalillian et al., (2014) showed that high levels of perceived

susceptibility, severity, and self-efficacy were predictive of effective diabetes

management.

SCT as articulated by Bandura (1986) posits that human behaviors are influenced

by three factors: environmental, behavioral and cognitive (Glanz & Bishop, 2010). SCT

has been used to gather data on modeled behavior and self-efficacy as influencing factors

in human behavior development and change (Glanz & Bishop, 2010). Self-efficacy has

been shown to be an important part of adherence to diabetes self-care behaviors in the

context of the HBM (Jalillian et al., 2014). SCT was a relevant theory for this particular

study because the interaction between the personal, cultural, and environmental factors of

self-efficacy, race, gender, and social support from family, friends, and health care

providers directly affects adherence to DSCAs (Bandura, 1986; Glanz & Bishop, 2010;

Song et al., 2012).

CBPR is an approach to research wherein community partners, participants, and

stakeholders are involved in the research process in an equitable manner at every stage of

the process (Cacari-Stone et al., 2014).Community partners, participants, and

stakeholders will be involved in recruitment, dissemination of results, and utilization of

data to create meaningful interventions in this particular study in an equitable manner

(Cacari-Stone et, al., 2014).

Nature of the Study

The study was a quantitative cross-sectional study to assess whether or not there

was a relationship between the levels of emotional, tangible, affectionate, and

informational support as measured on the SSSI survey and the performance of individual

DSCAs as measured on the SDSCA cross-sectional survey of a convenience sample of

African Americans with Type 1 or Type 2 diabetes in San Francisco (Creswell, 2009;

Moser et al., 2013; Schmitt et al., 2013; Sherbourne & Stewart, 1991; Toobert et al.,

2000). I used data from these surveys to assess the diabetes self-care behaviors among

African Americans with diabetes residing in San Francisco. I conducted a quantitative

cross-sectional study in which I asked participants to read an informed consent form and

complete Sections I and V from the DCP, the SDSCA survey, and the SSSI survey

(Creswell, 2009; Fitzgerald et al., 1996; Moser et. al, 2013; Schmitt et al., 2013;

Sherbourne & Stewart, 1991; Toobert et. al, 2000).

Operational Definitions

American Association of Diabetes Educators seven recommended diabetes

behaviors (*AADE7*): The seven recommended DSCAs or behaviors as recommended by

the AADE are medication adherence, diabetes-specific problem solving, checking blood

sugar, risk reduction (checking blood pressure, checking cholesterol, checking eyes,

checking feet, medical provider visit adherence), diabetes-specific healthy coping,

physical activity, and healthy eating (AADE, 2015).

Diabetes care profile (*DCP*): A less commonly used survey developed in 1996

that assesses levels of practice of DSCAs but from a psychosocial perspective and

includes a detailed demographics section (Fitzgerald et al., 1996).

Diabetes Control and Complications Trial (*DCCT*): This is one of the seminal

trials from 1982 to 1993 that showed that intensive glycemic control as in three or more

insulin injections per day compared with conventional treatment of less than three insulin

injections per day in patients with insulin-dependent diabetes mellitus, or Type 1 diabetes, would reduce microvascular complications such as retinopathy, nephropathy, and neuropathy (DCCT Research Group, 1993; Nathan, 2014).

Diabetes self-care activities (*DSCAs*): DSCAs are a cornerstone of diabetes management and are basically the same as the AADE7 and is used interchangeably with diabetes self-care behaviors or diabetes related self-care activities.

Diabetes self-management education (*DSME*): This is a form of informational support wherein people with diabetes are taught how to self-manage their disease; the AADE7, including SMBG, are a major part of DSME (Haas et al., 2014).

Epidemiology of Diabetes Interventions and Complications Study (*EDIC*): This long-term follow-up of the DCCT cohort from 1994 until the present demonstrated that the benefits of intensive insulin treatment continue to prevent complications even after the study was completed (Nathan, 2014).

Hemoglobin A1C (*A1C*): This is a measure of glycosylated hemoglobin in the blood that is used to assess levels of glycemic control over the past 3 months, for people with diabetes the goal is usually less than 7%, though this varies with individual patients (Courtemanche et al., 2013).

Insulin-dependent diabetes mellitus (*IDDM*): This is another way to describe Type 1 diabetes wherein the pancreas does not produce any insulin and the patient requires exogenous insulin to survive.

San Francisco Health Improvement Partnership (*SFHIP*): This is an organization in San Francisco that has established parameters for different health-related items

including diabetes, cardiovascular disease, hospitalization rates, and income this is updated every 1 to 2 years (SFHIP, 2015).

Self-monitoring of blood glucose (*SMBG*): Checking blood sugar is one of the recommended, AADE7 DSCAs and is a cornerstone of diabetes management (AADE, 2015; Haas et al., 2014).

Social Support Survey Instrument (*SSSI*): This is the survey that was established for the Medical Outcomes Study in 1991 but has since been used to measure individual levels of emotional, tangible, informational, and affectionate social support (Moser et al., 2012; Sherbourne & Stewart, 1991)

Summary of diabetes self-care activities (*SDSCAs*): A commonly used survey used to assess the level of practice of specific DSCAs in persons with diabetes over the past 7 days (Toobert et al., 2000).

United Kingdom Prospective Diabetes Study (*UKPDS*): This study demonstrated that intensive glycemic control and intensive blood pressure control reduced diabetes related complications in Type 2 diabetes. The difference was not as dramatic as in the DCCT with Type 1, but it was statistically significant (King, Peacock, & Donnelly, 1999).

Assumptions

The assumptions in this particular study were that self-reporting, when it comes to the participant's answers of the surveys, would be a reliable method of data collection. Another assumption was that participants would answer all the questions and that an adequate sample size would be recruited. The last assumption was that the sample would

be sufficient to extrapolate the data to African Americans in urban areas in other parts of the country.

Scope and Delimitations

The scope of this particular study was small but may still encourage future research and creation of targeted interventions that could start to impact the health disparities in African Americans with diabetes of increased rates of hospitalizations, morbidity, and mortality from the disease (Chow et al., 2012). The inclusion criteria for this study were as follows: participants had to be African American, aged 18 years and older, have Type 1 or Type 2 diabetes, and live in San Francisco. Exclusion criteria for this study were as follows: the participant was unable to provide informed consent, was unable to speak English, was pregnant, was not African American, did not live in San Francisco, or was unable to read the survey and instructions. Delimitations of this study were that the participants had to be African American, aged 18 years and older, with diabetes, and they had to live in San Francisco; furthermore, the participants had to have access to a computer to log in and answer the survey via SurveyMonkey online (see Mulala, 2015; Simon, 2011). The participants had to be willing and able to read and agree to the informed consent by answering yes to the question, "I consent to participate in this study," and completing the SDSCA, the SSSI, and Sections I and V of the DCP (Mulala, 2015).

Limitations

I used a convenience sample as opposed to a random sample, so the results cannot be extrapolated to the general population but can be only suggested, limiting the

generalizability of the study (Simon, 2011). It was also a cross-sectional study as opposed

to a longitudinal study, so it was only a snapshot of conditions occurring at that particular

time and place; for this reason, a cross-sectional study cannot be used to assess cause and

effect but can only be used to establish relationships (Simon, 2011). If one were able to

establish a relationship, future longitudinal studies could be planned to assess cause and

effect.

<div align="center">**Significance**</div>

This study could be of significance to this population and could also be of

significance to the field of diabetes studies. Few quantitative studies have examined

African Americans in urban areas and diabetes self-care behaviors, and especially lacking

are studies about the needs of low-income African Americans with diabetes in urban

areas (Clark & Utz, 2011; Tang et. al, 2008; Williams et al., 2014). There is also a lack of

studies assessing the relationship between specific types of social support and diabetes

behaviors (Tang et al., 2008). In this study, my goal was to fill in the gaps in knowledge

and assist in creating interventions to improve the performance of self-care behaviors

among African Americans in San Francisco. I was also trying to assess whether a

relationship exists between the specific types of social support and performance of said

behaviors among African Americans with diabetes and building on specific types of

social support available in the community if a positive relationship is found (Tang et al.,

2008; Rankin et al., 2014; Rosland et al., 2014). In addition, one could establish whether

or not there was a difference in the relationships between the specific types of social

support and performance of said behaviors in Type 1 versus Type 2 (Tang et al., 2008,

Rankin et al., 2014; Rosland et al., 2014). If already established community assets were used, then facilitation of diabetes behaviors could be readily available to all (Minkler, 2013). The interventions are more likely be used by the community because they are for and by the community (Minkler, 2013). The potential positive social change implications of this study was to reduce the disproportionately high levels of hospitalizations, morbidity, and mortality from diabetes among African Americans in San Francisco (Chow et. al, 2012; CDC, 2014; SFHIP, 2015). This could be expanded to include African Americans in other areas including urban, suburban, and rural (Chow et al., 2012; CDC, 2014; SFHIP, 2015).

Summary

Diabetes is a chronic disease that requires intense patient self-management to improve outcomes and reduce complications, morbidity, and mortality (Haas et al., 2014). Although people from all races and walks of life can be affected by diabetes, African Americans tend to be disproportionately affected by long-term complications and hospitalizations secondary to diabetes (Chow et al., 2012; SFHIP, 2015). African Americans had a 13.1% rate of diabetes diagnosis on a national level compared with 8.3% in California and a 15.8% rate in San Francisco, 90% of that is estimated to be Type 2 and 8% to 10% is Type 1 (CDC, 2014; Cochran et al., 2014; SFHIP, 2015).

DSCAs have been shown to be an effective method to improve diabetes management in both types of diabetes and reduce complications, ER visits, and hospitalizations (Haas et al., 2014). Social support is a factor in increasing levels of DSCAs (Rosland et. al, 2014; Tang et.la, 2008). There have been relatively few studies

where researchers have studied the effect of social support in African Americans with diabetes (Rosland et al., 2014; Tang et al., 2008). There have been no studies where researchers have investigated the effect of levels of emotional, tangible, affectionate, and informational social support as measured by the SSSI on DSCAs as measured by the SDSCA (Moser et al., 2013; Schmitt et al,, 2013, Tang et al., 2008).

I used the data I gathered to assess whether a relationship exists between perceived emotional, affectionate, tangible, and informational support and individual DSCAs (Tang et al., 2008; Schmitt et al., 2013). A positive relationship was found with two types of support and this provides an avenue for interventions to help reduce the disparities in complications, ER visits, and hospitalizations seen in African Americans secondary to diabetes (Chow et al., 2012; SFHIP, 2015). Ascertaining where the gaps in social support are and creating interventions to fill those gaps could indirectly increase levels of DSCAs in African Americans. This could lead to an overall reduction in complications and hospitalizations secondary to diabetes (Chow et al., 2012; Rosland et al., 2014; SFHIP, 2015; Tang et al., 2008). A reduction in the health disparities between African Americans and Caucasians with regard to ER visits, hospitalizations, and complications from diabetes would be of significant social benefit and could in the long run be applied to other minority groups with similar health disparities (CDC, 2014; Chow et al., 2012).

In Chapter 2, I focus on a review of the literature to establish the background, literature search strategy, theoretical foundation, and relationships between key variables and concepts. In addition, I provide a summary of the literature to date on the topic of

social support and DSCAs and how data from this particular study may help to fill the

established gap in knowledge.

Chapter 2: Literature Review

Introduction

As noted in the previous chapter, diabetes is a severe problem on a macroscale and a microscale, globally, nationally, and locally (Awah, 2014; CDC, 2014; SFHIP, 2015). In the United States, minority racial/ethnic groups seem to be disproportionately affected with increased levels of morbidity and mortality compared with the Caucasian population (CDC, 2014; Chow et al., 2012). Diabetes self-management (DSM) has been the cornerstone of diabetes care and performance of DSCAs, one of the main pathways to DSM and achieving glycemic control in people with diabetes (AADE, 2015; Courtemanche et al., 2013; Haas et al., 2014). Achieving effective glycemic control has been shown to reduce microvascular complications such as neuropathy, nephropathy, and retinopathy in people with both Type 1 and Type 2 diabetes (King et al., 1999; Nathan, 2014).

The seven recommended DSCAs of checking blood sugar, taking medication, diabetes-specific problem solving, physical activity, healthy eating, risk reduction, and diabetes-related healthy coping are most commonly measured using the SDSCA survey (AADE, 2015; Schmitt et al., 2013; Toobert et al., 2000). Multiple factors affect performance of DSCAs and one of the factors that have been studied is social support (Gao et al., 2013; Nicklett et al., 2013; Rosland et al., 2014; Song et al., 2013; Strome & Egede, 2012; Tang et al., 2008; Watkins et al., 2012). Social support has been studied for its effect on performance of DSCAs but it has been studied as a composite score for all types of social support, not how the individual types of social support differentially affect

performance of DSCAs (Tang et. al, 2008; Watkins et al., 2012). No studies had been done on how emotional, affectionate, informational, and tangible support could differentially affect DSCAs (Tang et. al, 2008).

The aim of my study was to assess the levels of perceived emotional, tangible, affectionate, and informational social support using the SSSI and relating them to the levels of DSCAs using the SDSCA (Moser et al., 2013; Sherbourne & Stewart, 1991; Toobert et al., 2000). The levels of the different types of social support were the independent variables and the score on the SDSCA was the dependent variable. The co-variables were the demographic data of gender, income, educational level, and age as measured from Section I and V of the DCP (Fitzgerald et al., 1989; Moser et al., 2013). If one could establish that a predictive relationship exists between the levels of social support and the SDSCA score, then one could create targeted interventions to address specific gaps in social support and specific lacks in performance of diabetes self-care behaviors (Mulala, 2015; Schmitt et al., 2013).

A beneficial social change implication that could result from this research was a reduction in the levels of hospitalizations, complications, and mortality secondary to diabetes in African Americans in San Francisco (CDC, 2014; Chow et al., 2012; SFHIP, 2015). If one could reduce the health disparity in this racial group in San Francisco perhaps the study could be replicated in African Americans in other urban areas and also in rural areas. The study could also be replicated in other racial ethnic groups that suffer from a health disparity in morbidity and mortality secondary to diabetes such as Latinos, Asian Pacific Islanders, and Native Americans (Chow et al., 2012). A similar study could

also be implemented in patients suffering from pre-diabetes and perhaps prevent the

progression to Type 2 diabetes among African Americans and other ethnic groups that

suffer from disparities in diagnosis of diabetes.

The literature review was to establish the current historical disparities in African

Americans with higher rates of diagnosis, hospitalizations, morbidity and mortality from

diabetes (CDC, 2014; Chow et al., 2012; SFHIP, 2015). In addition, the review of the

literature was to establish that social support had been found to be helpful in increasing

levels of some diabetes self-care behaviors but the effect social support had on other

diabetes behaviors had been inconsistent (Rankin et al., 2014; Rosland et al., 2014; Tang

et al., 2008). A systematic review of the literature showed the background and the current

state of knowledge in the different types of social support and the relationship to DSCAs.

Literature Search Strategy

The literature search strategy that was employed in this instance was web-based

searches in the Walden Library database and Google Scholar with a search parameter of

peer reviewed articles published in or after 2011. The exception to this was the search for

seminal articles on the theoretical frameworks for the HBM, SCT, seminal articles on

development for the SDSCA and SSSI and seminal diabetes studies for the UKPDS,

DCCT and the EDIC studies (Bandura, 1986; DCCT Research Group, 1993; King et al.,

1999; Rosenstock, 1974; Sherbourne & Stewart, 1991; Toobert et al., 2000). The search

terms used for the general literature review were *diabetes*; *social support; diabetes and

social support; diabetes and social support in African Americans*. In the case of Tang et

al. (2008), the study was published before 2011 but it was the only research I found that

was specifically focused on African Americans with diabetes and social support. For that reason, I included the study despite it being more than 5 years old. For the seminal studies, the search terms for the author and the main topic were used and there was no limitation of the publishing date parameters. The terms used were *SSSI, Sherbourne 1991; SDSCA, Toobert, 2000; UKPDS*; *King Peacock and Donnelly*; *DCCT Research Group 1993*; *EDIC*; *Nathan*; *Rosenstock and Health Belief Model*; *Bandura and Social Cognitive Theory* (Bandura, 1986; King et al., 1999; DCCT Research group, 1993; Nathan, 2014; Rosenstock, 1974).

Theoretical Foundation

The theoretical foundation of this particular study was based on a combination of three theories, the HBM, SCT, and CBPR (Bandura, 1986; Cacari-Stone et. al, 2014; Jalillian et al., 2014; Minkler, 2014; Rosenstock, 1974). The HBM is one of the oldest behavioral models used in health care studies, and it was created in the 1950s to try to explain why people did or did not use available preventative healthcare resources such as screenings (Glanz & Bishop, 2010; Rosenstock, 1974). This particular model posits the idea that people's health behaviors depend on the perceived severity, susceptibility, barriers to action, benefits of action, cues to action, and self-efficacy around specific disease states (Glanz & Bishop, 2010; Rosenstock, 1974).

The interaction of these disparate perceptions affects an individual's decision to act to prevent a disease or condition (Rosenstock, 1974). Perceived susceptibility to long-term complications from diabetes had an effect on an individual's decision to take action to manage the disease such as physical exercise, eating healthy, checking blood sugar,

reducing risks, problem solving, taking medication and healthy coping (AADE, 2015; Jalillian, 2014; Rosenstock, 1974).

Perceived severity of the long-term complications of diabetes, such as diabetic retinopathy, neuropathy, nephropathy, cardiovascular disease, amputations and early death had an effect on an individual's decision to practice the AADE7 behaviors to prevent such complications (AADE, 2015; Haas et al., 2014: Chow et al., 2012). DSME was a form of informational support that can educate people on some of the possible long-term complications of diabetes (Moser et al., 2014; Tang et al., 2008; Toobert et al., 2000; Williams et al., 2014). Perception of the barriers to practice of the AADE7 had an impact on an individual's likelihood of performing all seven behaviors consistently (AADE, 2015; Jalillian et al., 2014; Rosenstock, 1974).

Barriers such as transportation to the pharmacy, parks, grocery stores, gyms or doctor's offices or physical disabilities or cognitive disabilities or other individual barriers could all prevent effective consistent practice of the AADE7 (AADE, 2015; Glanz & Bishop, 2010; Rosenstock, 1974). Any of these barriers could have been construed as a lack of tangible support (Moser et al., 2014; Tang et al., 2008; Toobert Hampson & Glasgow). Perceived benefits to practice of the AADE7 as far as prevention of complications could be construed as positive tangible support (AADE, 2015; Haas et al., 2014; Moser et al., 2014; Tang et al., 2008; Toobert Hampson & Glasgow).

Cues to action are external or internal triggers that convince a person to take action to prevent complications from diabetes, such as practice of the AADE7 (AADE, 2015; Glanz & Bishop, 2010; Rosenstock, 1974). This can also be considered emotional

support in the form of support for continuance of the AADE7 from family, friends, healthcare providers and the media (AADE, 2015; Moser et al., 2014; Sherbourne & Stewart, 1991; Tang et al., 2008). The last construct of the HBM that was discussed was the idea of self-efficacy or in this case an individual's perceived ability to effectively practice the AADE7 for prevention of complications from diabetes (AADE, 2015; Glanz & Bishop, 2010; Jalillian et al., 2014). This last was not a form of support in and of itself but self-efficacy could be bolstered by all four forms of support, affectionate, informational, emotional and tangible and higher levels of self-efficacy had been shown to boost practice of the AADE7 (AADE, 2015; Jalillian et al., 2014; Moser et al., 2012; Tang et al., 2008; Toobert et al., 2000). Diabetes specific social support was provided in the form of affectionate support, informational support, emotional support or tangible support and could bolster self-efficacy and improve performance of the AADE7 (Fitzgerald et al., 1996; Tang et al., 2008).

SCT posited the idea that human behavior was best explained by a reciprocal model that included environmental, cognitive and personal influences on behavior that were bi-directional and interactive and that all had variable effects on behavior (Bandura, 1989). What people thought, believed and felt affected how they behaved as did their environment, physiology, brain chemistry, family structure and culture (Bandura, 1989). Behavioral expectations, beliefs and emotions were affected by information received through instruction, social persuasion and modeling (Bandura, 1989). Age, size, race, sex, social roles and status as well as physical attractiveness all elicited differential social reactions from the environment, independent of what was said and done (Bandura, 1989).

In the case of diabetes management and analysis of survey results the SCT and its precepts of bi-directional reciprocity between environment, personal beliefs, positive modelling and cognition was of help to create an understanding as to why people did or did not practice the AADE7 recommended behaviors (AADE, 2015; Bandura, 1989). Based on belief, understanding of the benefits of the behaviors and based on an environment conducive to practice of the behaviors as well as positive role models that showed the benefits of the behaviors, these all contributed to a higher likelihood of the behaviors being practiced on a regular basis (AADE, 2015; Bandura, 1989; Jalillian et al., 2014).

CBPR was another theory this dissertation research was guided by, in that the attempt was made to involve the community in as many steps of the research process as were feasible including recruitment, results dissemination, and then hopefully application at the policy and intervention level (Cacari-Stone et al., 2014). Most CBPR literature emphasized engagement that was equitable among all participants based on capacity, in this case the principal researcher engaged community members by sharing results on a dedicated website, Facebook, Instagram and Twitter (Cacari-Stone et al., 2014). The community was engaged in recruitment by the principal investigator speaking at churches, communicating with community members, stakeholders and community leaders. The information about the study was also shared on Facebook, Twitter, Instagram and the website. This engagement was used to recruit participants, disseminate the results and assist the community with education of politicians for potential policy change based on the results (Cacari-Stone et al., 2014). This dissertation was a way to

add to the research on how functional social support and diabetes related support may affect performance of DSCAs (Sherbourne & Stewart, 1991; Tang et al., 2008). Once this was established the research may be used for suggestions of targeted interventions and the information was provided free of charge to the community on the dedicated website and Facebook page to assist in lobbying local health departments to effect change.

Literature Review Related to Key Variables and/or Constructs

Social support was used as a term that has been defined in many different ways but the most common terms associated it with social networks, that the provision of social support was one of the most important functions provided by the social relationships in a social network (Heany & Israel, 2008). Social support in the case of chronic disease was how members of one's social network provided support in management of the disease, this support was the functional aspect of relationships and was categorized into four acts or behaviors (Heaney & Israel, 2008). The four types of functional social support were emotional, informational, practical or tangible, and affectionate or affirmational support (Heany & Israel, 2008; Sherbourne & Stewart, 1991; Tang et al., 2008). Social support was always intended to be positive or helpful by the one providing the support, but sometimes despite good intentions had negative results, such as outdated informational support (Heaney & Israel, 2008; Rankin et al., 2014).

Affectionate support was described as when members of one's social network engaged in acts that provided care, love, trust and empathy (Sherbourne & Stewart, 1991). Informational support was described as when members of one's social network engaged in acts that provided information, advice and suggestions that could be used to

solve a problem or manage a disease (Heaney & Israel, 2008). Practical or tangible support was described as when members of one's social network provided services and concrete aid that was of direct assistance to the person in need or managing a disease (Heaney & Israel, 2008). Emotional support was when members of one's social network provided emotional and constructive feedback that was helpful for self-evaluation and or improvement of disease management (Sherbourne & Stewart, 1991). Much research had been done on how general measures of social support are related to diabetes management (Gao et al., 2013; Nicklett et al., 2013; Rankin et al., 2014; Rosland et al., 2014). But no research had been done on whether the four different types of social support had a differentiated relationship with overall DSCAs (Heaney & Israel, 2008; Tang et al., 2008).

The SSSI was developed to be an accurate, validated measurement of the different functional aspects of social support (Sherbourne & Stewart, 1991). The SSSI questionnaire was separated into questions that addressed levels of emotional support, informational support, tangible or practical support and affectionate or affirmational support (Sherbourne & Stewart, 1991). Previous scales for social support did not separate out the different functional aspects or focused solely on the quantity and quality of social relationships (Sherbourne & Stewart, 1991). A modified version of the SSSI, the 8 item modified SSSI had been shown to be as valid as the full version, with fewer questions it was easier for patients with chronic disease states to answer and took less time but did not contain the full spectrum of questions to fully evaluate all four functional types of social support (Moser et al., 2012). Despite reduced burden on respondents of the modified

SSSI, the full version provided greater amounts of useful data since multiple questions for each functional aspect generated greater validity (Moser et al., 2012; Sherbourne & Stewart, 1991).

Effective diabetes management through regular performance of DSCAs had been shown to reduce micro-vascular long-term complications in people with diabetes (King, Peacock and Donnelly, 1999; Nathan, 2014). Social support had been shown to be a factor that was helpful in encouraging people with diabetes to practice the AADE7 recommended behaviors and effectively manage their disease (Gao et al., 2013; Hill-Briggs et al., 2011; Miller & DiMatteo, 2010; Nicklett, Heisler, Spencer & Rosland, 2013; Rankin et al., 2014; Rosland et. al, 2014; Song et al., 2012; Strom & Egede, 2013; Tang et al., 2008; Watkins et al., 2013; Williams et al., 2014). African Americans had been shown to have been disproportionately affected with higher rates of diabetes diagnosis and higher rates of long term complications from diabetes in San Francisco as well as nationally (CDC, 2014; SFHIP, 2015).

Gao et.al. (2013) identified that self-efficacy, patient provider communication, social support and diabetes self-care all had an effect on glycemic control as measured by A1C but only diabetes self-care had a direct effect on glycemic control. Self–efficacy, social support and patient provider communications all had an effect on DSCAs which indirectly affected glycemic control as measured by the structural equation modeling the researchers used to create a conceptual model (Gao et al., 2013). This study was conducted on 222 adults in a primary care facility and recommended that longitudinal studies be conducted to confirm the absolute effect that social support, patient provider

communications and self-efficacy had on DSCAs and glycemic control (Gao et al., 2013). In addition, this research was conducted in a purely Chinese population so more research needs to be done to assess if the same effect occurred in other races and nationalities (Gao et al., 2013). Lastly this study utilized a generalized measure of social support instead of a differentiated one of the four types of social support so was unable to assess which particular type of social support exerted the most impact (Gao et al., 2013)

Hill-Briggs et al., (2011) focused on DSME and how a problem solving based DSME program had an effect on performance of DSCAs. DSME had been described as a form of informational social support and as such had been demonstrated in the literature to have a beneficial effect on performance of DSCAs and thus a possible indirect effect on glycemic control (Hill-Briggs et al., 2011). As Gao et al., (2013) stated, self-efficacy and generalized social support had a direct effect on performance of self-care behaviors and thus an indirect effect on glycemic control. This intervention had two arms, the first was a condensed form of DSME where participants only received a single class of DSME and a problem solving class called Diabetes and Your Heart Facts an Information Workbook along with Hitting your Targets for Diabetes and Your Heart: A Problem Solving Workbook (Hill- Briggs et al., 2011). The intensive arm of the program had the participants getting nine different 90 minute weekly sessions after the introductory session of diabetes and cardiovascular disease and problem solving, the other sessions covered specific diabetes related problems and problem solving methods (Hill-Briggs et al., 2011). The intensive version yielded better results in patients with glycemic control as

evidenced by a statistically significant difference in A1C levels as well as better knowledge retention than the participants in the condensed arm (Hill-Briggs et al., 2011).

The researchers studying social support from family and friends and the relationship to adherence to treatment and DSCAs as recommended in the AADE7 have yielded contradictory data, some data supports a positive effect whereas other studies have yielded data that posits a negative effect on adherence (DiMatteo & Miller, 2013). The majority of the data gathered shows that non-adherence in the case of diabetes management and treatment has taken place due to multiple reasons (DiMatteo & Miller, 2013). Some of the reasons are, financial issues, side effects, difficulty in management, complicated regimens, lack of social support and lack of health literacy (DiMatteo & Miller, 2013). There can be negative effects from social support such as when family and friends are not supportive of diabetes treatment regimens and DSCAs (DiMatteo & Miller, 2013). Negative familial support can be detrimental to adherence whereas high levels of positive familial support can be positively predictive of adherence (DiMatteo & Miller, 2013).

The data gathered during the research conducted by Nicklett et al., (2013) added further evidence to support the premise that social support was a factor that improved DSCAs. Improvement of DSCAs indirectly improved glycemic control potentially leading to reductions in morbidity and mortality from complications of diabetes (Nicklett et al., 2013). This particular study yielded data that lent credence to the idea that direct social support had a greater effect on health than indirect social support, especially support that was focused on specific behaviors (Nicklett et al., 2013). Support that was

focused on physical activity, adherence to medical practitioner visits and taking medications had a greater effect on Self-Reported Health (SRH) than did support for other practices such as checking feet, checking blood sugar, following a healthy eating plan and keeping one's weight under control (Nicklett et al., 2013). More research needs to be done to ascertain whether direct social support for any of these behaviors actually translates to increased performance of said behaviors (Nicklett et al., 2013). This could be regarded as tangible support to assist in performance of specific activities (Heiden & Israel, 2008). The idea should be explored further of whether encouragement of patients to bring a "medical visit companion" who is a family member or friend to medical visits and educational classes can be an effective way to provide such support (Nicklett et al., 2013).

In patients with Type 1 diabetes, research by Rankin et.al. (2014) yielded data that alluded to the idea that different patients had different requirements for social support. This made sense for patients with Type 1, the majority of whom have had diabetes since they were young children and some patients reported that the need for support from parents depended on their age at diagnosis (Rankin et al., 2014). Outdated information from parents and friends had the potential to become a barrier to effective diabetes management by being negative support instead of positive support (Rankin et al., 2014). In this grounded theory study patients' preferences for social support ranged along a continuum from minimal involvement all the way to patient preferences for regular assistance and monitoring (Rankin et al., 2014). Patients diagnosed as adults rarely reported parental involvement whereas those diagnosed as young children described

continued parental involvement though this could be positive or negative based on parental ability to adapt to new recommendations (Rankin et al., 2014). Patients with Type 1 described a need for direct regimen specific social support and tangible social support such as driving people to the gym or physician's office and picking up prescriptions (Rankin et al., 2014). This mirrored what was found with people with Type 2 diabetes, as they also seemed to benefit more from regimen specific support and tangible support (Nicklett et al., 2013).

Rosland et al., (2014) studied the relationship between social support, lifestyle and medical diabetes self-management. In this study the researchers found that higher social network scores and higher emotional support scores were related to physical activity, healthy eating and checking feet (Rosland et al., 2014). But high levels of social network and emotional support were not found to be related to the rest of the seven recommended diabetes self-care behaviors such as medication adherence, healthy coping, problem solving and checking blood sugar (Rosland et al., 2014). According to this study, social network and emotional support were more closely related to lifestyle behaviors and the influence diminished as the behaviors became more skilled and medical or diabetes specific (Rosland et al., 2014). Perhaps looking at just emotional support and social network levels was not the most effective way to influence medically related highly skilled behaviors? Perhaps affectionate, tangible or informational support had a greater effect than emotional support on more skilled, medical or diabetes specific behaviors (Rosland et al., 2014; Tang et al., 2008)? The study proposed for this dissertation was a way to gather data on whether or not tangible, affectionate, emotional

and informational support had a differentiated effect on one or more of the DSCAs (Mulala, 2015; Rosland et al., 2014).

Song et al., (2012) focused on a sample of Korean Americans with Type 2 diabetes, in this population, direct regimen related social support was measured using the social support subscale from the DCP survey tool. Self-efficacy was measured using a modified version of the Stanford Chronic Disease Self-efficacy scale (Song et al., 2012). DSCAs was measured using the SDSCA survey tool and then stepwise multiple linear regression was applied using the covariates of age, gender, education, number of family members, duration of diabetes, comorbidities, self-efficacy and unmet needs for social support (Song et al., 2012). Higher age, higher levels of self-efficacy and lower levels of unmet social support needs was positively correlated with improved practice of DSCAs (Song et al., 2012). Increased age was positively related to higher levels of self-efficacy, as was longer duration of diabetes, whereas unmet needs for social support were negatively related to practice of DSCAs (Song et al., 2012). More research needs to be done around the optimal levels and types of social support and assessing levels of individual needs for unmet social support, some people need more support or specific types of support than others and this type of support should be individualized (Song et al., 2012).

Strom & Egede (2013) performed a systematic review of current research since 2009. They reviewed 37 articles altogether, of these articles 17 investigated the impact of social support on clinical outcomes, 13 on modification of behavior, five on preferences of support and two on psychological and social factors (Strom & Egede, 2013). Of the

clinical outcome articles, 14 provided data that demonstrated a positive relationship with social support and with the behavior modification articles, 11 provided data that also demonstrated a positive relationship with social support (Strom & Egede, 2013). The two psychological/social outcomes articles both provided data that demonstrated a positive relationship with higher social support being related to lower levels of stress as well as a reduction in depressive symptoms (Strom & Egede, 2013). When it came to preferences of social support there was a demonstrated difference between the races, Caucasians preferred support from media, Latino's preferred group based or telephone support, whereas African Americans showed no preference between Internet, group or telephone support (Strom & Egede, 2013). African Americans and Latinos showed a preference for support from family and friends whereas Caucasians preferred support from healthcare professionals or media (Strom & Egede, 2013). This particular study demonstrated that overall social support had been shown, in the majority of studies, to be positively correlated with improvement in self-care behaviors, clinical outcomes or psychosocial factors (Strom & Egede, 2013). More research is required to discover which is the most effective type of social support and specific preferences from different cultural groups in addition to how specific types of social support affect specific DSCAs (Strom & Egede, 2013). A positive relationship was found with physical activity, healthy diet, checking feet and medication adherence but not in every study, more focused studies need to be performed to assess which specific types of support affect which behaviors (Strom & Egede, 2013).

The research conducted by Tang et al., (2008) demonstrated an overall positive effect of social support for 89 African Americans. Satisfaction with support demonstrated improvement in diabetes specific quality of life, glucose monitoring, healthy eating plan, and physical activity and for diabetes specific social support on the self-care behaviors (Tang et al., 2008). In this particular study the researchers found out that negative social support was related to not taking medication as indicated which was a significant finding as it could help to predict why certain people were non-compliant (Tang et al., 2008). These researchers concluded that more investigation was needed to ascertain what the effect of specific types of emotional, tangible, affectionate and informational social support have on specific diabetes behaviors (Tang et al., 2008).

In a study conducted by Watkins et.al (2013) the relationship between spiritual beliefs and DSCAs was examined as was the relationship of social support in addition to the covariates of age, income and gender in a group of African Americans with Type 2 diabetes. A statistically significant relationship was found between spiritual beliefs and general diet whereas general social support was found to be a significant predictor of general diet, foot care and specific diet (Watkins et al., 2013). This particular study brought to the forefront the idea that African American patients' religious/spiritual beliefs as well as social support should be determined and utilized to improve diabetes related behavioral practices and that this could be an important consideration for diabetes patients of other racial groups (Watkins et al., 2013).

Williams et al., (2014) conducted research assessing the benefits on clinical outcomes in rural African Americans with Type 2 diabetes after a culturally tailored

DSME intervention was conducted and participants were followed for 2 years. This type of DSME intervention could be considered a form of informational support as participants were informed about the AADE7 recommended diabetes behaviors (Williams et al., 2014). Participants were also shown specific instances of problem solving through video vignette story telling (Williams et al., 2014). This program showed a statistically significant effect on foot-care, exercise, diabetes knowledge and mental health and would also potentially directly affect the DSCAs of problem solving since it is information that is focused on that ability (Williams et. al, 2014). More research is required to assess whether or not this type of program would be as effective in urban African Americans and other ethnic groups in rural or urban areas (Williams et al., 2014).

A recent study by Barnard et.al. (2015) gathered insight from the second Diabetes, Attitudes, Wishes and Needs (DAWN2) study and ascertained that people with both Type 1 and Type 2 diabetes were less likely to perform DSCAs as often if they also reported emotional problems or distress. The DAWN2 study was conducted in 17 countries and there were differences in results between the countries, this assessment is based on the UK portion including 500 British people with diabetes and 261 British healthcare providers (Barnard et al., 2015). People who only reported physical issues with diabetes performed DSCAs at a statistically significantly higher rate than those that reported physical and emotional issues (Barnard et al., 2015). The participants in this study also reported less likelihood of healthcare providers asking them about emotional issues and providing emotional support (Barnard et al., 2015). This perceived lack of emotional support from healthcare providers demonstrated a need to improve the

assessment of emotional support at regular providers visits (Barnard et al., 2015). This also demonstrated a need to assess other functional aspects of tangible, affectionate and informational support on a regular basis (Barnard et al., 2015)

Summary and Conclusions

Overall the majority of research assessed the relationship between social support and DSCAs showed a positively predictive relationship but only for specific behaviors (Barnard et al., 2015; Gao et al., 2013; Hill-Briggs et al., 2011; Miller & DiMatteo, 2010; Nicklett et al., 2013; Rankin et al., 2014; Rosland et. al, 2014; Song et al., 2012; Strom & Egede, 2013; Tang et al., 2008; Watkins et al., 2013; Williams et al., 2014). Further research is needed to assess how the specific types of affectionate, informational, tangible and emotional support affect the AADE7 diabetes behaviors (AADE, 2015; Tang et al., 2008). Evidence has shown that certain types of social support have a positively predictive effect on six of the seven AADE7 behaviors of physical activity, healthy diet, medication adherence, glucose testing, checking feet and problem solving (Barnard et al., 2015; Gao et al., 2013; Hill-Briggs et al., 2011; Miller & DiMatteo, 2010; Nicklett, Heisler, Spencer & Rosland, 2013; Rankin et al., 2014; Rosland et. al, 2014; Song et al., 2012; Strom & Egede, 2013; Tang et al., 2008; Watkins et al., 2013; Williams et al., 2014). More research needs to be done to find out if specific types of support can affect the last behavior of healthy coping (AADE7, 2015; Barnard et al., 2015; Rosland et al., 2014; Tang et al., 2008). The data gathered from this study was to assess the relationship between perceived support for specific diabetes behaviors, perceived emotional, tangible,

affectionate and informational support and whether or not an increase in this support translated to improved practice of specific DSCAs (Mulala, 2015).

In Chapter 3 the proposed methods were discussed for this cross-sectional quantitative survey study in African Americans with diabetes in San Francisco and how the SDSCA survey and the SSSI surveys along with the demographic data from the DCP were utilized. I also detailed the utilization of SPSS for multivariate analysis to assess whether or not there is a relationship between the perceived measures of functional social support and performance of DSCAs.

Chapter 3: Research Method

Introduction

Diabetes is a growing problem on a global, national, and local scale but seems to disproportionately affect minority populations such as African Americans, Latinos, Asians, and American Indians or Alaska Natives (IDF, 2014; CDC, 2014; SFHIP, 2015). San Francisco has higher rates of diagnosis for diabetes in African Americans than the rates for California and the nation (SFHIP, 2015). In the meantime, the overall rate of diabetes in San Francisco was lower than the rest of the state and nation and all the other racial/ethnic groups had lower rates in San Francisco than the state or national rates (Conroy et al., 2014: CDC, 2014; SFHIP, 2015). In Chapter 3, I discuss the research design, rationale, and methodology, and I delve into an in-depth discussion about possible threats to validity.

I used a quantitative research methodology, specifically a cross-sectional survey design, because of the need for a convenient sample size and the need for a quick turnaround of the data (Creswell, 2009). The surveys that I used were Sections I and V of the DCP (Appendix D), the SSSI (Appendix C), and the SDSCA (Appendix E), and permission was granted where necessary for use of the surveys. See respective appendixes (Fitzgerald et al., 1996; Moser et al., 2012; Sherbourne & Stewart, 1991; Toobert et al., 2000).

Research Design and Rationale

A scarcity of research has focused on how functional social support affects the diabetes self-care behaviors among African Americans with diabetes, and most of the

research had been done on patients with Type 2 diabetes using composite social support scores (Tang et al., 2008; Watkins et al., 2012; Williams et al., 2014). No research has been done on how the specific components of emotional, tangible, affectionate, and informational social support differentially affect performance of the seven recommended DSCAs (AADE, 2015; Tang et al., 2008). With this cross-sectional survey, preliminary information was gathered by using three surveys. I used the SSSI, the SDSCA, and Sections I and V of the DCP (Fitzgerald et al., 1996; Sherbourne & Stewart, 1991; Toobert et al., 2000). The DCP was used to gather demographic information of age, race, marital status, gender, income, diabetes-specific social support, and need for support as well as educational level (Fitzgerald et al., 1996).

Quantitative research was utilized to establish whether a relationship exists between specific variables to answer research questions or hypotheses through the means of experiments or analysis of data (Creswell, 2009). The independent variables in this study were the four specific types of social support: emotional, tangible, affectionate, and informational support as measured on the SSSI (Creswell, 2009; Moser et al., 2012). The dependent variable was the overall score on the SDSCA survey; a higher score on the SDSCA survey signaled a higher number of the DSCAs being performed more days per week (Toobert et al., 2000). The activities measured on the SDSCA were diet, physical activity, blood sugar testing, foot care, smoking, and taking medication (Toobert et al., 2000).

The SDSCA did not include measurements of problem solving or healthy coping, which were two of the seven AADE recommended self-care behaviors, though it did

include the other five behaviors (AADE, 2015; Toobert et al., 2000). Though the SDSCA did not include all seven recommended behaviors, healthy coping was extrapolated from social support survey responses; higher levels of emotional and affirmational support have been shown to improve levels of healthy coping (AADE, 2015). The other item that was not included in the SDSCA was diabetes-related problem solving, but informational support such as that provided by diabetes educators increased levels of problem solving by providing the tools for people with diabetes to solve specific diabetes-related problems they will face (AADE, 2015; Williams et al., 2015). In addition, specific questions in Section V of the DCP addressed problem solving and healthy coping (Fitzgerald et al., 1986).

The control variables that were to be added to the model were the demographic variables of age, gender, income and educational level as measured in section I and V of the DCP (Fitzgerald et al., 1996). These control variables were continuous variables that were not the main independent variables but may have had an effect on the dependent variable and were included to reduce bias and show the actual influence of the main independent variables on the dependent variable (Creswell, 2009).

The main research questions of this study were the following:

1. What is the rate of diabetes related self-care behaviors being performed in this sample of African Americans in San Francisco based on the SDSCA survey?

2. What is the level of perceived emotional, tangible, informational and affectionate support as measured on the SSSI survey?

3. What is the relationship between SDSCA scores and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco adjusted for the demographic variables of age, gender, income and educational level utilizing multiple linear regression?

The main hypotheses are the following:

H_0: There is no relationship between the SDSCA score and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco.

H_1: There is a relationship between the SDSCA score and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco.

The SDSCA overall score was the dependent variable and emotional, affectionate, informational and tangible support scores as measured on the SSSI survey were the independent variables (Creswell, 2009; Moser et al., 2012; Toobert et al., 2000). The covariables of age, gender, income and educational level were included to reduce internal bias, to more accurately demonstrate the actual influence of the independent variables on the dependent variable (Creswell, 2009).

The quantitative survey design was chosen because the observation had already been made and established that African Americans in San Francisco have higher rates of diabetes diagnosis, complications, morbidity and mortality (CDC, 2014; Chow et al., 2012; SFHIP, 2015). It had also already been established that increased levels of performance of DSCAs led to improved glycemic control and lower levels of

microvascular complications in Type 1 and Type 2 diabetes (CDC, 2014; King et al., 1999; Nathan, 2014; Williams et al., 2014). This particular study was a cross-sectional survey design to assess whether or not there was a relationship between emotional, informational, tangible and affectionate support as the independent variables and overall diabetes self-care as measured by the SDSCA as the dependent variable (Mulala, 2015; Toobert et al., 2000). The cross-sectional survey design was chosen in the interest of time and budget, because this was a dissertation project and the attempt was being made to keep data collection within the time-frame of three months, a longitudinal design did not make sense (Creswell, 2009). In addition, since this was a self-financed project, surveys that were mostly available in the public domain were utilized. Subjects were recruited online via social media with Facebook, Instagram and Twitter and completed the survey through the survey monkey link in their own time from these same sources. Participants were also recruited through word of mouth in the community, flyers posted at the YMCA, flyers posted at the public library, through community group Dance out Diabetes and flyers posted at local churches. The use of an online survey saves money by avoiding fees from mailing surveys and reduces the amount of participants lost to follow-up as well as maintaining anonymity (Creswell, 2009). The surveys will be digitized with permission of the authors and then offered via a survey monkey link on the website, Facebook, Instagram and Twitter.

Since quantitative research is best utilized to explain what was observed this particular study attempted to provide a rationale as to why there were higher complications in African Americans with diabetes in San Francisco (Chow et al., 2012;

Mulala, 2015; SFHIP, 2015). Perhaps it was because this particular group was not performing some or all of the recommended DSCAs? Perhaps they were lacking in a particular type of support and this was impacting their ability to perform DSCAs? Or perhaps neither one of these possibilities was the correct one. The data gathered from this study by having participants fill out Section I and V of the DCP, the SDSCA and the MOS SSSI was done to show the current levels of DSCAs, demographic information and levels of perceived emotional, tangible, informational and affectionate support (Fitzgerald et al., 1996; Moser et al., 2012; Toobert et al., 2000).

Methodology

The population of San Francisco as of the last census estimate of July 2014 was 852,469 with 6.1% of the population being African American this resulted in a documented population of this racial group of 52,000 (US Census Bureau, 2015). According to the SFHIP 15.8% of African Americans in San Francisco had diabetes and this would mean that the total study population relevant to this dissertation was 8,216 African Americans with diabetes living in San Francisco (SFHIP, 2015). The G* Power tool was utilized to estimate sample size, with an α of 0.05, a power of 0.95 and the four predictors of emotional, tangible, affectionate and informational social support and an effect size of 0.15 a sample size of 129 was calculated (Buchner, Erdfelder, Franz & Lang, 2013, Faraone, 2008). Cohen suggested that an effect size of 0.2 could be considered to be small, 0.5 was considered medium and 0.8 was considered to be large, to make sure to not overestimate the effect of social support on DSCAs the smallest possible effect size of 0.15 was being used to estimate the sample size (Faraone, 2008).

A convenience sample of at least 129 African Americans with diabetes who live in San Francisco was to be recruited; the inclusion criteria for participants was that they be aged 18 and older, that they have Type 1 or Type 2 diabetes, be African American and live in San Francisco. Participants who had gestational diabetes, were pregnant with Type 1 or Type 2 diabetes, had diabetes secondary to medication, could not speak English, could not read or had mental disabilities were to be excluded from the study. Participants were invited by posting of flyers and word of mouth at the Bayview YMCA, the Bayview Public Library, Individual doctor's offices, Temple United Methodist Church, Calvary Hill Community Church, Ingleside Baptist Church, Trinity Baptist Church, Grace Tabernacle and through the community group Dance out Diabetes. The flyers described the surveys and the informed consent forms via the survey monkey link on the website, Facebook, Twitter and Instagram to complete at their convenience. Any participants that decided not to participate before December 30th 2016 were allowed to notify the principal investigator via the website, Facebook, Twitter or Instagram with their unique identifier number and their survey data was removed from the study. The data was anonymous as participants did not use their name they used the date they filled out the form, their month and day of birth and the last two digits of their social security number to create their unique identifier. For example, my number would be 111916090825 if I filled out the surveys out on 11/19/16.

Once a minimum of 129 surveys had been filled out the data was analyzed using SPSS software and initially processed utilizing multiple linear regression (MLR). The scores for emotional, affectionate, tangible and informational support were the 4

independent variables and the overall SDSCA score was the dependent variable (Field, 2013; Fitzgerald et al., 1996; Toobert et al., 2000). Because the assumptions for multiple linear regression of linearity, homoscedasticity, no or low multi-co-linearity and auto-correlation were not met, binary logistic regression(BLR) was used instead (Statistical Solutions, 2016). To utilize logistic regression, the SDSCA score was made into a categorical variable by designating it as higher or lower than the median (Statistical Solutions, 2016). For multiple linear regression after the first model age, gender, income level and educational level were added using stepwise multiple linear regression to assess the effect the additional co-variables have on the dependent variable to differentiate the effect of the independent variables (Field, 2013). For BLR the co-variables were entered along with the main independent and dependent variables to show the differential effect on the dependent variable between the co-variables and the main independent variables. Upon assessment it was found that the assumption of low or no multi-collinearity was not met for BLR either so a Spearman *rho* correlation was run instead as this particular analysis did not have any assumptions that needed to be met (Statistical Solutions, 2017). Spearman correlation did not allow for assessment of covariables so age, gender, educational level and income were assessed independently for their relationship with the dependent variable.

Once the data had been analyzed a conclusion was drawn as to whether or not there was a relationship between the four types of social support and the overall SDSCA score (Moser et al., 2012; Tang et al., 2008; Toobert et al., 2000). If there was a relationship between the four types of social support and DSCAs then one could propose

ideas for potential interventions designed to change specific types of social support to potentially increase DSCAs (Mulala, 2015).

Instrumentation and Operationalization of Constructs

The three instruments that were utilized for this dissertation study were the DCP (Appendix D), the SDSCA (Appendix E) and the SSSI [Appendix C] (Fitzgerald et al., 1996; Moser et al., 2013; Sherbourne & Stewart, 1991; Toobert, Hampson & Glasgow). Both the SSSI and the DCP were in the public domain and were allowed to be used without permission as long as the authors were cited and for the SDSCA permission was received from the authors by purchasing the rights for use (Oregon Research Institute, n.d.). The DCP was developed in 1996 by Fitzgerald et.al. (1996) to help measure the psychological and social factors that were important to help patients to manage their diabetes. Intensive diabetes therapy required strict adherence to DSCAs, more frequent monitoring of blood glucose and more frequent dosing of oral medications and/or insulin (Fitzgerald et al., 1996). Being able to identify and potentially ameliorate any real or perceived social or psychological barriers was a way to allow participants and healthcare providers to optimize the environment for the most effective diabetes management (Fitzgerald et al., l996).

The DCP tool was unique in that it comprehensively covered psychological and social aspects of diabetes and diabetes treatment, the DCP also contained a section for demographic information and self-care practices (Fitzgerald et al., 1996). The DCP evolved from a prior instrument called the Diabetes Educational Profile (DEP) (Fitzgerald et al., 1996). The DEP was created to assess the psychological, educational

and social needs of people with diabetes, it was based on the constructs of the HBM of perceived seriousness, susceptibility, benefits, barriers, cues to action and self-efficacy (Fitzgerald et al., 1996; Glanz & Bishop, 2010).

In this particular study I only used Sections I and V of the DCP because the SDSCA was a much shorter assessment of diabetes behaviors than the DCP and placed less burden on the participants with its reduced response time (Fitzgerald et al., 1996). Section I of the DCP was mostly demographic though question 14 asked about blood sugar testing and Section V had questions about how much support was needed for each activity and how much support was received (Fitzgerald et al., 1996). Only section I and V of the DCP were used to provide invaluable information that was of assistance in analysis of the data that was gathered from the SDSCA and SSSI (Fitzgerald et al., 1996; Sherbourne & Stewart, 1991; Toobert et al., 2000). In addition to the covariates of age, gender, income, and educational level, these sections added information about perceived needs versus receipt of support and sources of support (Fitzgerald et al., 1996).

The SDSCA was a survey that asked people how many of the specified DSCAs were performed on how many days of the week over the past 7 days (Toobert et al., 2000). The SDSCA was created by Toobert, Hampson & Glasgow (2000) in 1982 and was probably one of the most commonly used self-report instruments to measure diabetes self-management. Despite being a self-report measure this instrument had shown internal and external validity and test/re-test reliability (Toobert et al., 2000). The SDSCA had been modified and utilized as a survey tool in multiple formats as a self-administered survey with pen and paper, via the internet and via touchscreen computer (Toobert et al.,

2000). The SDSCA had a moderate internal consistency score with a mean of 0.47, a test/re-test correlation average r=0.40, correlations between the SDSCA scales measuring different self-care activities were understandably low and consistent with results found in previous research with a mean r=0.23 (Toobert et al., 2000). The SDSCA had been used since 2001 to assess performance of DSCAs and had been tested and used effectively in African Americans (Clark & Utz, 2011). Despite low initial reliability scores it had been used empirically and it is currently the only test that had been proven to effectively show self- care activities in African Americans (Clark & Utz, 2011; Toobert, Hampson & Glasgow). Toobert, Hampson & Glasgow (2000) analyzed seven different studies utilizing the SDSCA survey instrument and they investigated previous use of this instrument and found validity and reliability to be quite stable over the previous 18 years of use.

The SSSI was developed by Sherbourne & Stewart (1991) in 1985, to be used in the Medical Outcomes Study(MOS) a two-year longitudinal observational study of 2349 patients with chronic diseases in three different practice settings. The three different patient care settings were Health Maintenance Organizations (HMOs), Large Multispecialty Groups (LMSGs) and individual fee for service practices (Sherbourne & Stewart, 2000). The sample size included in the study that assessed the social support survey included all 2987 patients who completed the self-enrollment questionnaire but not all of those patients went on to complete the MOS (Sherbourne & Stewart, 1991). The sample was 39% male, 68% married, 46% completed high school and 20% non-

white and the age ranged from 18-98 years old with an average age of 55 (Sherbourne & Stewart, 1991).

Based on their initial pilot study the researchers narrowed down 19 support items based on the literature that were the most appropriate items to measure the 5 social support dimensions of emotional support, informational support, tangible support, positive social interaction and affectionate support (Sherbourne & Stewart, 1991). Affectionate support was not discussed as a separate type of social support in the literature (Sherbourne & Stewart, 1991). Despite this, the authors felt that measuring perceived levels of affectionate support (demonstration of love and affection) would be of relevance for patients with chronic diseases (Sherbourne & Stewart, 1991). Emotional support, informational support, tangible support and affectionate support were found to be the measures of functional support (Sherbourne & Stewart, 1991). Positive social interaction was found to be a measure of structural support and had low correlations with the other social support dimensions (Sherbourne & Stewart, 1991). This survey showed high reliability with correlations ranging from 0.72-0.87 on the tangible support scale (Sherbourne & Stewart, 1991). The reliability ranged from 0.82-0.90 on the emotional/informational support scale, 0.80-0.86 on the affectionate support scale and 0.87-0.88 on the positive interaction scale (Sherbourne & Stewart, 1991). The validity was also high with Pearson correlations of health measures with social support all being statistically significant with $p< .01$ (Sherbourne & Stewart, 1991). The health measures against which the social support measures were validated were myriad (Sherbourne & Stewart, 1991). Loneliness, marital functioning, family functioning, mental health,

current health, physical role limitations, emotional role limitations, physical functioning,

effects of pain, energy/fatigue, pain severity, social activity, and physical symptoms

(Sherbourne & Stewart, 1991). All three of these surveys had been shown to be valid and

reliable and had been utilized in populations of color with diabetes so were appropriate

for this dissertation (Fitzgerald et al., 1986; Sherbourne & Stewart, 1991; Toobert et al.,

2000).

Operationalization

Table 1

Operationalization of Variables

Name of variable	Type of variable	Level of measurement	Number of the items on the survey
SDSCA score	Dependent variable	Continuous	25 (Appendix E)
Perceived Emotional support	Independent Variable	Continuous	5 (Appendix C)
Perceived tangible support	Independent Variable	Continuous	4 (Appendix C)
Perceived Affectionate support	Independent Variable	Continuous	3 (Appendix C)
Perceived informational support	Independent variable	Continuous	3 (Appendix C)
Gender	Covariable	Categorical	1 (Appendix D)
Income	Covariable	Ordinal	1 (Appendix D)
Marital status	Covariable	Categorical	1 (Appendix D)
Age	Covariable	Ordinal	1 (Appendix D)
Educational level	Covariable	Ordinal	1 (Appendix D)

Note. SDSCA, XX.

The dependent variable was the overall SDSCA score for each participant, the higher the score, the more of the DSCA's the individual had practiced on more days in the past week (Toobert et al., 2000) (Table 1). The independent variables were the emotional, informational, tangible and affectionate support scores as measured on the SSSI survey (Sherbourne & Stewart, 1991). The covariables were the participants, gender (M/F), age (18-29, 30-49, 50-65, 65 and over) marital status (never married, married, separated/divorced, widowed), income (0-$4,999, $5,000-$9,999, $10,000-$14,999, $15,000- $19,999, $20,000-$29,999, $30,000-$39,999, $40,000-$49,999, $50,000-$59,999, $60,000+) and educational level (less than high school, high school diploma, some college, bachelor's degree, graduate degree). A public access website was set up and Facebook, Twitter and Instagram. Once data analysis was completed results were posted to the website, Facebook, Twitter and Instagram to provide for the community participatory component. Flyers were posted in public spaces and included the website address, Twitter, Facebook and Instagram address so participants could keep track of and comment on study progress (Cacari-Stone et al., 2014).

Data Analysis

The data was input into SPSS and MLR was initially run to assess whether or not there was a relationship between the four measures of functional support of emotional, informational, tangible and affectionate support and the SDSCA (Field, 2013). Since the four measures could be correlated they were assessed for multi-co-linearity, the assumptions that needed to be met to perform multiple linear regression were homoscedasticity, linearity, no auto-correlation and low or no multi-co-linearity

(Statistical Solutions, 2016). The assumption of low or no multi co-linearity was not met so then BLR was used instead by turning the SDSCA score into a dichotomous categorical variable by using the median of the SDSCA score distribution as the cut-off point of this potential dichotomous variable (Statistical Solutions, 2016). The assumptions one needed to meet for logistic regression are less rigorous, a dichotomous dependent variable, no outliers in the predictors by converting to z-scores and removing any data above 3.29 or below -3.29 and no multi-co-linearity among predictors (Statistical Solutions, 2016). But since BLR also required no multi co-linearity this assumption was not met and Spearman correlation was used instead since this analytical test had no assumptions that needed to be met. The covariates of gender, age, marital status and income were entered independently to assess if these variables changed the relationship between the dependent and independent variables in any way (Field, 2013).

The following are the research questions and the hypotheses that were attempted to be tested in this project. For research question one we will be using the descriptive statistics of age, gender, educational level and income as the covariables and the higher the overall SDSCA score the more self-care behaviors are being performed on more days per week:

1. What is the rate of diabetes related self-care behaviors being performed in this sample of African Americans in San Francisco based on the SDSCA survey? (the descriptive statistics of age, gender, educational level and income will be included to see how they affect the dependent variable as covariables).

2. What is the level of perceived emotional, tangible, informational and affectionate support as measured on the SSSI survey?

3. What is the relationship between SDSCA scores and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco adjusted for the demographic variables of age, gender, income and educational level?

H_0: There is no relationship between the SDSCA score and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco.

H_1: There is a relationship between the SDSCA score and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco.

Threats to Validity

The main threat to internal validity in this particular study was that the SDSCA survey was based on participant recall of their behavior over the past seven days and the SSSI measured perceptions of social support not actual support (Toobert et al., 2000; Sherbourne & Stewart, 1991). This threat was addressed by using validated surveys; the surveys being utilized had been shown to have empirical validity over time despite relying on personal recall and had been shown to have good validity in comparison to other instruments (Clark & Utz, 2011; Fitzgerald et al., 1986; Sherbourne & Stewart, 1991; Toobert et al., 2000). Perception of social support had been shown to have a true influence on behavior independent of actual available support so this supported the

construct validity of the SSSI survey (Fitzgerald et al., 1986). The threat to external

validity was that these results may not be generalizable to the general population as this

was a cross-sectional survey and we only had 129 participants. Since these results

showed a relationship between the dependent and independent variables a

recommendation was made for future research to do a longitudinal study. The

recommendation included a request for a large and representative enough randomized

sample to be generalizable to the entire population since this study's results were not

generalizable due to the use of a convenience sample.

Ethical Concerns

The ethical issues were that participants might feel that answering questions on

the surveys and giving informed consent would invade their privacy. After receiving

Walden's IRB approval (#10-14-16-0438652), in this dissertation project participants

were asked to read an informed consent form. This form let them know that they could

rescind their permission at any time before December 30th 2016. They were also

informed that submission of the surveys with a yes answer to the question "I agree to

participate in this study" was their consent. They were asked to submit their unique

identification number of the date they filled out the anonymous survey, the two- digit

month and two-digit day of their birth and the last two digits of their social security

number. I provided a dedicated website, Facebook, Twitter and Instagram for participants

to contact me with any questions, to remove themselves from the study or to follow the

progress of the study. This is how I attempted to alleviate fears of lack of privacy since

unique identification numbers were assigned to each participant and I was blinded as to

which participant filled out which forms. All the hard copy data was kept in a locked cabinet at the home of the principal investigator and digital data was in a password secured section of the survey monkey site and there were no personal identifiers on any of the materials.

The data was analyzed using SPSS to assess any potential relationships between the functional social support elements of emotional support, informational support, tangible support & affectionate support as measured on the SSSI and DSCAs as measured by the SDSCA (Fitzgerald et al., 1986; Sherbourne & Stewart, 1991). The relationship results found were displayed on the study website, Facebook, Instagram and Twitter to share ongoing progress with the community as part of the CBPR component of the study (Cacari-Stone et al., 2015). All results displayed contained no personal identifiers and only showed descriptive composites for age, gender, income, educational level, diabetes type, SDSCA scores and SSSI scores (Fitzgerald et al., 1986; Sherbourne & Stewart, 1991; Toobert et al., 2000).

Participants were asked to read the informed consent forms, complete the SDSCA survey, the SSSI survey and section I and V of the DCP (Fitzgerald et al., 1986; Sherbourne & Stewart, 1991; Toobert et al., 2000). Participants were given the opportunity to opt out of the study before December 30, 2016 by contacting the principal investigator at the email address provided and providing their unique numerical identifier at which point their data was removed from the study. Participants were emailed a link to access their $5 e-gift card upon completion of the surveys and after reading the informed consent then their email address was deleted. Though this is compensation it was not be

offered as an incentive before the participants was recruited to be involved in the study but it was included in the informed consent in the spirit of full disclosure.

Summary

This study was conducted by recruiting African American participants aged 18 and over in San Francisco who self-identified as having diabetes, they were recruited through word of mouth in the community, flyers, and social media (Mulala, 2015). Flyers were posted in public spaces at individual doctor's offices, Bayview Hunters Point YMCA, Bayview Hunters Point Public Library, Trinity Baptist Church, Temple United Methodist Church, Calvary Hill Community Church, Ingleside Baptist Church, Grace Tabernacle, and through the Dance Out Diabetes website. A community website was created and after data analysis results were posted on the website, Facebook, Instagram and Twitter.

The SDSCA scores and SSSI scores were analyzed using SPSS to assess if there is a relationship between the SDSCA score as the dependent variable and the SSSI scores as the independent variables (Fitzgerald et al., 1986; Sherbourne & Stewart, 1991; Toobert et al., 2000). The demographic data from section I and V of the DCP of age, gender, educational level and income was used as covariables in a stepwise manner to assess whether any of these covariables created a difference in the relationship. Ethical concerns were addressed by notifying participants of their right to withdraw at any point before December 30th, 2016 and by maintaining anonymity with no personal identifiers and an online survey. All participants completing the surveys and informed consent were given instructions on how to access the $5 e-gift card. Though the card was not used as

an incentive before participants were recruited to participate in the study it was disclosed in the informed consent form in the interests of transparency.

In chapter four the results gathered during data collection were discussed in the context of a brief review of the research questions and the hypothesis. Also descriptive statistics were included to describe the sample. After description of the sample, the chapter continued with a description of the statistical tests of MLR used on the gathered data of SDSCA and SSSI scores and since the assumptions were not met a description of BLR and since those assumptions were no met either, Spearman correlation was used. The rationale for and utility of the covariables of age, gender, educational level and income was also explained.

Chapter 4: Results

Introduction

The purpose of this research was to assess whether a relationship exists between the dependent variable of the SDSCA and the independent variables of emotional support, informational support, affectionate support, and tangible support. The research questions were the following:

1. What is the rate of diabetes related self-care behaviors being performed in this sample of African Americans in San Francisco based on the SDSCA survey? (the descriptive statistics of age, gender, educational level and income will be included to see how they affect the dependent variable as covariables).

2. What is the level of perceived emotional, tangible, informational and affectionate support as measured on the SSSI survey?

3. What is the relationship between SDSCA scores and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco adjusted for the demographic variables of age, gender, income and educational level?

H_0: There is no relationship between the SDSCA score and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco.

H_1: There is a relationship between the SDSCA score and the emotional, tangible, informational and affectionate score from the SSSI survey in African Americans with diabetes in San Francisco.

I organized results in this chapter according to the following plan: a description of the data collection process and how it differed from the plan in Chapter 3; a description of the recruitment time frame, response rate, and report baseline descriptive and demographic data; results after the evaluation of statistical assumptions, exact statistics, and probability values. I then report analysis results.

Data Collection

Data collection commenced on October 15th 2016 and ended on December 18th 2016, after the Walden University Institutional Review Board (IRB) approved the requested research with approval number 10-14-16-0438652 on October 14. The questions from the SDSCA survey, SSSI, and Sections I and V of the DCP were typed into survey monkey to create a single survey with 51 questions (Appendixes C, D, and E). The survey monkey link was posted on the Facebook, website and Twitter page and shared via email with potential participants and shareholders. A targeted Facebook Ad was sent out focused on African Americans aged 18 and over with diabetes in San Francisco. The survey was completed online by willing participants then they emailed the diabetessocialsupprt@gmail.com address and they were sent a link to a $5 e-gift card if they met the requirements of being African American aged 18 and over with diabetes living with San Francisco. Upon sending out the link the participant email address was deleted to maintain anonymity. As was discussed in Chapter 3 the sample size calculator G* Power was used to estimate a sample size of 129 for a Power of 0.95, an α of 0.05, and an effect size of 0.15. Based on this sample size data collection was stopped when

130 responses were received from individuals that met the criteria of African American

aged 18 and over with diabetes living in San Francisco.

Study Results

Once the data was collected, the SDSCA score, emotional, informational, tangible

and affectionate scores were calculated and the demographic data were entered. Once the

data was entered into SPSS for each participant the data was analyzed using multiple

linear regression.

Table 2

Descriptive Statistics of the Study Sample

	M	*SD*	*N*
Summary of diabetes self-care activities score	33.1231	7.82068	130
Emotional support score	14.69.23	2.25796	130
Affectionate support score	7.9615	1.82746	130
Practical/tangible support score	12.2538	2.10688	130
Informational support score	9.0615	1.28651	130
Age of participants	87%<45	.NA	130
Gender of participant	50% Female	.NA	130
Marital status	95% married	NA	130
Educational level of participant	87% some college/college graduate	.NA	130
Income of participants	67% <$40,000	NA	130

Note. NA, not applicable.

When the SDSCA survey was scored each question asked the participant on how many of the last seven days they had performed specific DSCAs and the maximum score was 71 (Toobert et al., 2000). The number of days was their score for that question except for the question about on how many of the past seven days participants had eaten red meat or full fat foods which were reverse scored 0=8, 1=7, 2=6, 3=5, 4=4, 5=3, 6=2, 7=1 (Toobert et al., 2000). On the question about whether or not the participant had smoked any cigarettes in the past seven days and if they had smoked none they got one point and if they had smoked one or more they get zero points (Toobert et al., 2000).

For the SSSI survey the answers were on a Likert scale and the answers were scored as follows:

None of the time =1

A little of the time=2

Some of the time=3

Most of the time=4

All of the time=5

The Emotional support score was question 1,5,7,8 and of the questionnaire with a maximum score of 20 and the Informational score was question 2, 3, 4 and 6 with a maximum score of 20. The Tangible/practical support score was 10,11,12 and 13 with a maximum score of 20 and the Affectionate score was questions 14,15 and 16 with a maximum score of 15 (Sherbourne & Stewart, 1991).

The income question was used from the demographics section of the DCP survey and had 9 possible responses ranging from 1= less than $5000 to 9=$60,000+. These

responses were consolidated to improve the analysis into 1=$10,000-$29,999, 2= $30,000-$39,999 and 3=$40,000+ and 67% of the participants earned less than $40,000. The age question that was used from the demographic section of the DCP was formatted as 1=18-24, 2=25-34, 3=35-44, 4=45-54, 5=55-64, 6=65-74 and 7=75+. For data analysis the answers were consolidated and the variable was coded as 1=18-24, 2=25-34, 3=35-44 and 4=45+ and 87% of the participants were aged less than 45. Another variable that was changed was the level of education variable. Which on the questionnaire from the DCP gave the participants six options. The options were 1=8grades or less; 2= some high school; 3=high school graduate or GED; 4=some college or technical school; 5=college graduate/bachelors; 6=graduate degree. The responses were re-coded as: 1=some high school/high school graduate; 2=some college or technical school; 3=college graduate/bachelors or graduate school. The results showed that 87% of participants had some college or were college graduates. The next variable that was recoded was that of marital status, the questionnaire options were 1=never married, 2=married, 3=separated/divorced, 4=widowed. For the analysis data was recoded as 1=never married, 2=married and 95% of our participants were married.

RQ1: What is the rate of performance of DSCAs as measured by the SDSCA score in African Americans in San Francisco?

The mean SDSCA score was 33.123 and the median was 32 out of 71. We had three participants score ≥ 50 which is equivalent to five or more days per week of performance of DSCAs which was equivalent to 2.31% of our sample (Table 3).

Table 3

Summary of Diabetes Self-Care Activities Score

	Frequency	%	Valid %	Cumulative %
6.00	1	0.8	0.8	0.8
16.0	1	0.8	0.8	1.5
17.0	3	2.3	2.3	3.8
18.0	1	0.8	0.8	4.6
19.0	3	2.3	2.3	6.9
20.0	2	1.5	1.5	8.5
21.0	3	2.3	2.3	10.8
23.0	5	3.8	3.8	14.6
24.0	1	0.8	0.8	15.4
26.0	1	0.8	0.8	16.2
27.0	1	0.8	0.8	16.9
28.0	3	2.3	2.3	19.2
29.0	6	4.6	4.6	23.8
30.0	3	2.3	2.3	26.2
31.0	3	2.3	2.3	28.5
32.0	29	22.3	22.3	50.8
33.0	2	1.5	1.5	52.3
34.0	1	0.8	0.8	53.1
35.0	19	14.6	14.6	67.7
36.0	3	2.3	2.3	70.0
37.0	5	3.8	3.8	73.8
38.0	2	1.5	1.5	75.4
39.0	7	5.4	5.4	80.8
40.0	5	3.8	3.8	84.6
41.0	5	3.8	3.8	88.5
42.0	4	3.1	3.1	91.5
43.0	3	2.3	2.3	93.8
44.0	1	0.8	0.8	94.6
45.0	2	1.5	1.5	96.2
46.0	1	0.8	0.8	96.9
47.0	1	0.8	0.8	97.7
51.0	1	0.8	0.8	98.5
52.0	1	0.8	0.8	99.2
55.0	1	0.8	0.8	100.0
Total	130	100.0	100.0	

RQ2: What is the rate of emotional, informational, affectionate and practical/tangible support in African Americans in San Francisco?

The mode score for emotional support was 16 out of a maximum score of 20 with 44.6% of participants achieving that score. The mode for the informational support was nine out

of a maximum score of 15, with 55.6% of participants achieving that score. The mode for

the practical/tangible support score was 13 with a maximum score of 20 with 46.9% of

participants achieving that score. The mode was seven for the affectionate support score

out of a maximum score of 15 with 46.9% of participants achieving that score (Tables 4-

8).

Table 4.

Emotional Support Score

		Frequency	Percent	Valid Percent	Cumulative Percent
	9.00	1	.8	.8	.8
	10.00	4	3.1	3.1	3.8
	11.00	9	6.9	6.9	10.8
	12.00	15	11.5	11.5	22.3
	13.00	12	9.2	9.2	31.5
	14.00	9	6.9	6.9	38.5
Valid	15.00	8	6.2	6.2	44.6
	16.00	58	44.6	44.6	89.2
	17.00	6	4.6	4.6	93.8
	18.00	3	2.3	2.3	96.2
	19.00	4	3.1	3.1	99.2
	20.00	1	.8	.8	100.0
	Total	130	100.0	100.0	

Table 5.

Informational Support Score

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5.00	2	1.5	1.5	1.5
	6.00	5	3.8	3.8	5.4
	7.00	7	5.4	5.4	10.8
	8.00	9	6.9	6.9	17.7
	9.00	72	55.4	55.4	73.1
	10.00	20	15.4	15.4	88.5
	11.00	11	8.5	8.5	96.9
	12.00	4	3.1	3.1	100.0
	Total	130	100.0	100.0	

Table 6.

Affectionate Support Score

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4.00	1	.8	.8	.8
	5.00	1	.8	.8	1.5
	6.00	5	3.8	3.8	5.4
	7.00	61	46.9	46.9	52.3
	8.00	31	23.8	23.8	76.2
	9.00	14	10.8	10.8	86.9
	10.00	8	6.2	6.2	93.1
	11.00	5	3.8	3.8	96.9
	12.00	1	.8	.8	97.7
	13.00	1	.8	.8	98.5
	15.00	1	.8	.8	99.2
	20.00	1	.8	.8	100.0
	Total	130	100.0	100.0	

Table 7.

Practical/Tangible Support Score

		Frequency	Percent	Valid Percent	Cumulative Percent
	6.00	2	1.5	1.5	1.5
	8.00	4	3.1	3.1	4.6
	9.00	2	1.5	1.5	6.2
	10.00	20	15.4	15.4	21.5
	11.00	14	10.8	10.8	32.3
	12.00	10	7.7	7.7	40.0
	13.00	61	46.9	46.9	86.9
Valid	14.00	8	6.2	6.2	93.1
	15.00	2	1.5	1.5	94.6
	16.00	3	2.3	2.3	96.9
	17.00	1	.8	.8	97.7
	18.00	1	.8	.8	98.5
	19.00	1	.8	.8	99.2
	20.00	1	.8	.8	100.0
	Total	130	100.0	100.0	

RQ3: What is the relationship between SDSCA scores and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco adjusted for the demographic variables of age, gender, income and educational level this will be assessed using multiple linear regression?

The research question of what is the rate of performance of DSCAs as measured by the SDSCA score is evidenced by the frequency of participants scoring SDSCA scores greater than the median score of 32.

Table 8.

Classification Table

		Predicted Summary of Diabetes Self Care Activities		
Observed		Less than 32	More than 32	Percentage Correct
Summary of Diabetes Self Care Activities	Less than 32	53	13	80.3%
	More than 32	24	40	62.5
Overall Percentage				71.5

a. Constant is included in the model
b. The cut value is .500

Based on the binary logistic regression Hosmer Lemshow test the *p* value of .737 which is not statistically significant shows that this model was a good fit. The block zero model without the independent variables, showed a prediction for an SDSCA score of more than 32, 50.8% of the time. The Cox and Snell R Square value of .263 and the Nagelkerke R Square value of .351 show that the predictors account for 26.3% to 35.1% of the variance in the predicted score. This model correctly predicted that the SDSCA score would be greater than 32, 62.5% of the time. But the overall score was greater than 32, 64 times out of the 130 participants so 49.2% of the participants scored greater than

32. So the answer to RQ1 is that 49.2% of the participants scored greater than the median of 32 on the SDSCA score.

After using SPSS to run multiple linear regression and checking the results for assumption testing it was found that the collected data did not meet the assumptions for Multiple Linear Regression. The assumptions for Multiple Linear Regression are linearity, normality, no auto-correlation, no or little multi- collinearity and homoscedasticity (Statistics, 2017). The assumption of no or little multi-collinearity was not met as evidenced by the Coefficients table in the MLR output showing a value greater than 0.9 for two variables. The output showed a value of 1.0 for informational support and a value of 0.995 for income. Therefore, these two variables showed evidence of multi-collinearity and for this reason the data was subsequently analyzed using binary logistic regression as was discussed as the alternative plan in Chapter 3 if the assumptions for Multiple Linear Regression were not met. But the assumptions for binary logistic regression also include an assumption of low or no multicollinearity. So this means the assumptions for binary logistic regression were not met either. Since there are no assumptions for Spearman rank correlations this is what was run next.

To convert the data into a binary dependent variable, I used the categories of above the median or below the median of 32. So each of the scores was changed into 1= less than 32 and 2=more than 32, and a second dataset was created converting all the scores to 1 or 2 values. After the conversion a test for a Spearman rank correlation was run in SPSS to assess whether any of the independent variables and covariables showed a relationship with the dependent variable.

Table 9.

Spearman Rank Correlations

	Summary of Diabetes Self Care Activities		
	Correlation Coefficient	*P*	N
Summary of Diabetes Self-Care Activities	1	.	130
Emotional Support Score	-.149	.091	130
Informational Support score	.267**	.002	130
Affectionate support score	.348**	.000	130
Practical/Tangible score	-.096	.278	130
Age	.122	.166	130
Gender	-.308**	.000	130
Educational level	.215*	.014	130
Income	-.255*	.003	130

*Correlation is significant at the 0.05 level
** Correlation is significant at the 0.01 level

The Correlations Table 9 showed a statistical significant relationship between the dependent variable and two of the independent variables. The Spearman correlation between informational support and the SDSCA score was statistically significant at 0.267 with a *p* value < .01 (.002) and the affection support score had a Spearman correlation of 0.348 with a *p* value < .01 (.000). The .267 and .348 are considered weak correlations

with .00- .019 considered very weak, .20- .39 considered weak .40-.59 considered

moderate, .60- .79 considered strong and .80- 1.0 considered very strong (Statstutor,

n.d.). The emotional support score and the practical/tangible support score were

negatively correlated to the SDSCA score but the correlation was not statistically

significant. The co-variable of educational level was positively correlated at a statistically

significant level $r=$ .215 with a p value $< .05$ (.014). The co-variables of gender

(1=female and 2=male) and income were negatively correlated at a statistically

significant level. The results were $r=-.308$ with a p value $<.01$ (.000) for Gender and $r=-$

.255 with a p value $<.01$ (.003) for income which would both be considered weak

correlations (Statstutor, n.d.). Age was positively correlated but the result was not

statistically significant. Since the assumptions for binary logistic regression were not met

a Spearman correlation test was run and statistically significant correlations were found

between affection, informational support and the SDSCA score. A negative relationship

was found between practical, emotional support and the SDSCA though not a statistically

significant one. Since relationships were found between the SDSCA score and the

emotional, affectionate, practical and informational support I will reject the null

hypothesis.

Summary

This research study collected data utilizing an electronic survey accessed via

survey monkey targeted towards African Americans with diabetes living in San

Francisco. Initially the intention was to use Multiple Linear Regression to assess whether

or not there was a relationship between the dependent variable and the independent

variables. Upon running the multiple linear regression test in SPSS and testing the assumptions, the data did not meet the assumption of low or no multi-collinearity. So as per the previously described plan in Chapter 3 the data was re-analyzed using binary logistic regression. For binary logistic regression the dependent variables had to be a binary variable, so the SDSCA was re-coded as above and below the median, 0=below 32 and 1=above 32. Upon further assessment it became clear that because of the multi-collinearity of the data, assumptions for binary logistic regression were not met either. So instead of MLR or BLR a Spearman correlation was run because for this particular bi-variate analysis the data does not have to meet any assumptions.

Upon running the Spearman Correlations test in SPSS on the data it was found that there was correlation between the independent variables and the dependent variable, but a statistically significant relationship was only found with two of the independent variables. The Informational support score and the Affectionate support score had a positive and statistically significant relationship with the SDSCA score. The Emotional support score and the Practical/Tangible support score were found to have a correlation to the SDSCA score. This correlation was negative and not found to be statistically significant. Based on these results I rejected the null hypothesis that there is no relationship between the SDSCA score and the emotional, informational, tangible and affectionate support scores.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

I conducted this study to ascertain the primary reason for the health disparities in diabetes-related hospitalizations, ER visits, and complications among African Americans in San Francisco (SFHIP, 2015). The AADE has recommended seven DSCAs called the AADE7 (AADE, 2017). The seven behaviors are eating healthy, exercising, monitoring blood sugar levels, taking medication, diabetes-related problem solving, diabetes-related healthy coping, and reducing risks [e.g., managing blood pressure, managing cholesterol, and checking feet] (AADE, 2017). Regular performance of DSCAs has been shown to reduce complications, hospitalizations, and ER visits. In this study, I measured DSCAs by using the SDSCA survey (Toobert et al., 2000).

Social support is the functional effect of social support networks such as friends, family, and other people who one can turn to in times of crisis (University of Minnesota, 2017). Adequate social support can provide a buffer against difficult life events such as chronic disease and can improve self-image and create a broader focus to manage these adverse events (University of Minnesota, 2017). *Functional social support* can be defined as emotional, affectionate, informational, and tangible or practical support (Sherbourne & Stewart, 1991; Tang et al., 2008). In this research study, measurement of levels of functional social support was conducted by using the SSSI (Sherbourne & Stewart, 1991).

The primary research hypothesis was that a relationship exists between levels of emotional, informational, affectionate, and practical support as measured on the SSSI and

the performance of DSCAs as measured on the SDSCA survey. The primary research questions were created to investigate the following topics:

1. What is the rate of diabetes related self-care behaviors being performed in this sample of African Americans in San Francisco based on the SDSCA survey? (the descriptive statistics of age, gender, educational level and income will be included to see how they affect the dependent variable as covariables).

2. What is the level of perceived emotional, tangible, informational and affectionate support as measured on the SSSI survey?

3. What is the relationship between SDSCA scores and emotional, tangible, informational and affectionate support as measured on the SSSI survey in African Americans with diabetes in San Francisco adjusted for the demographic variables of age, gender, income and educational level?

Key Findings of the Study

The median rate of performance of DSCAs as measured on the SDSCA was 32 of 71. The levels of perceived emotional, tangible, informational, and affectionate support as measured on the SSSI were assessed as the median level out of a maximum score. The affectionate score was a median of 7 of a maximum score of 15, informational was 9 of a maximum of 20, emotional was 16 of a maximum of 20, and practical was 13 of a maximum possible score of 20. The emotional support score measured the positive effect, expressions of feelings and, empathetic understanding of diabetes management . Affectionate support measured love and affection and its expression, informational support, measured the amount of advice, guidance, information, or feedback; practical

support measured the amount of material assistance or assistance with behaviors (Sherbourne & Stewart, 1991). Though emotional and affectionate support seem similar, a difference exists in emotional expressions of and expressions of feelings with regard to diabetes and the general expressions of affection and love.

The problem of increased diagnosis, complications and hospitalizations from diabetes is one that is borne disproportionately by minorities in the United States. African Americans, Native Americans, Latinos, and Asian/Pacific Islanders all have higher rates than Caucasians. This study was an attempt to find a potential reason as to why African Americans in San Francisco experienced higher levels of complications, hospitalizations and ER visits secondary to diabetes diagnosis (SFHIP, 2015). If a relationship could be found between DSCAs and emotional, informational, affectionate and practical support this could potentially be an avenue to create effective interventions to improve performance of DSCAs. Improvement of DSCAs by modification of functional emotional support based on relationships found in this study. According to Spearman's correlation the analysis found that informational and affectionate support had positive statistically significant relationships with the SDSCA score. Emotional and practical support had negative relationships with the SDSCA score though these relationships were not statistically significant.

Interpretation of the Findings

Effective diabetes management by regular performance of DSCAs has been shown to reduce complications in people with diabetes (King et al., 1999; Nathan, 2014). Leveraging the relationship between the levels of functional social support and the

SDSCA survey can potentially be an avenue for interventions to improve performance of DSCAs in highly impacted communities. African Americans with diabetes in San Francisco have higher rates of hospitalizations and ER admissions secondary to complications from diabetes than Caucasians, Latinos and Asians (SFHIP, 2015). According to the results of this study, the median score for the SDSCA was 32 out of 71 in this population of African Americans in San Francisco. Performance of 5 or more of the DSCAs 5 or more days per week has been shown to be high compliance with a score of 50 or higher out of 71 (Redmond, 2004). This population is only at a median of 32 which is lower than high compliance, only 2.3% of the participants scored an SDSCA score of 50 or higher. This low compliance could be the reason why African Americans have higher rates of complications, hospitalizations and ER admissions secondary to diabetes exacerbations (SFHIP, 2015).

Previous research found a positive relationship between emotional, practical, affectionate and informational support and performance of DSCAs (Miller & Dimatteo, 2010; Nicklett et al., 2013; Jalillian et al., 2014; Purcell et al., 2013; Rankin et al.,2014; Rosland et al., 2014; Song et al., 2012; Strom & Egede, 2013). Hill-Briggs et al., (2011) Some researchers found a positive relationship between problem solving based diabetes self-management education (DSME) and performance of DSCAs which is a form of informational support (Clark & Utz, 2013; Hill-Briggs et al., 2011; Strom & Egede, 2013). This mirrors the finding in this study which was a statistically significant positive relationship between the informational support score and the SDSCA score.

Rosland et al., (2014) found a positive relationship between emotional support and physical activity, checking feet and healthy eating but not the other AADE7 behaviors of healthy coping, problem solving, taking medication or checking blood sugar. This is potentially an explanation as to why in this study a statistically significant positive relationship was found with affectionate support and the SDSCA score, as well as negative relationship with emotional support were found. Affectionate and emotional support overlap in their definitions and correlations have been found between certain DSCAs and not with others. That creates one potential explanation of why in this study, affectionate support was positively correlated with the SDSCA score and that emotional support was negatively correlated with the SDSCA score.

Practical support has been shown to be positively correlated to DSCAs in certain studies and negatively correlated in others (DiMatteo & Miller, 2013; Rankin et al.,2014). Therefore, in this study the fact that practical support was negatively correlated with the SDSCA score can be explained by the fact that practical support has been correlated positively with certain DSCAs in certain patients and negatively correlated with others (DiMatteo & Miller 2013).

Barnard et al. (2015) found that there was a spectrum of need among patients with Type 1 diabetes where some people wanted a great deal of support and others wanted minimal support. In the meta-analysis conducted by Strom and Egede (2013) positive correlations as well negative correlations with DSCAs and emotional support were found. The idea that there is a negative correlation for emotional social support is consistent with the idea that there is a possibility for negative social support (Barnard et al., 2015).

Things like outdated informational support and misguided family, friends, or healthcare personnel can derail a person with diabetes (Barnard et al., 2015).

Limitations of the Study

Limitations of this particular study are that this was a cross-sectional survey design study with a limited number of participants, although statistical power was achieved. Another limitation of this study is that because it was cross-sectional it only showed a relationship between the two variables and this cannot be utilized to prove cause and effect because it is cross-sectional and just measures a moment in time (Institute for work and health, 2009). Also, this study is not generalizable to the entire population of African Americans with diabetes because it is not a longitudinal study and this was not a randomized sample (Institute for work and health, 2009). This study also investigated the composite SDSCA score but did not focus on the differential relationship between the different levels of functional social support and the individual types of DSCAs. A last limitation was that Research question number 3 asking about adjusting for the co-variables of age, gender, income and educational level was unable to be answered since Spearman Correlation was used instead of Multiple Linear Regression. Individual correlations were run and a negative correlation was found with gender and income that was statistically significant whereas a positive correlation was found with age and educational level but the relationship was not statistically significant.

Recommendations

The first recommendation for future studies is to conduct a longitudinal study that will assess whether there is cause and effect between emotional, informational,

affectionate and practical support and the DSCAs utilizing the SDSCA to assess DSCAs.

A longitudinal study assessing if there is a differential causal relationship between

emotional, informational, affectionate and practical support and the DSCAs of physical

activity, healthy eating, checking blood sugar, risk reduction, problem solving, healthy

coping and taking medication. This proposed study should include a pre and post-test

component to assess levels of DSCAs using the SDSCA prior to and after the

intervention. This study should also involve a larger sample size which could use social

media like targeted Facebook advertising to recruit this larger sample size and then use a

randomization program to randomly select participants from all the responses (Kosinski

et al., 2015). One potential intervention could be establishment of DSME opportunities in

the community and in individual practices to boost levels of informational support and

refer patients to those classes regularly. Hill-Briggs et.al.(2011) demonstrated a

statistically significant effect on performance of DSCAs and glycemic control in the

intensive education group that had 10 weekly 90 minute educational sessions. This effect

was not demonstrated in the non-intensive group that only had one single class (Hill-

Briggs et al., 2011). So this intervention should include a series of regular classes not the

standard of care of a single class. Another potential intervention to boost informational

support could be to use social media such as Facebook, Instagram, Twitter, email and

blogs to provide diabetes specific information (Greene et al., 2011; Kaufman, 2015). A

second potential intervention would be establishment of peer support groups to boost

levels of affectionate support and referring all African American patients with diabetes to

attend such groups on a regular basis. A third potential intervention could be to ask all

African American people with diabetes to bring a friend or family member to medical

provider appointments and DSME classes so they have the support they need. In addition

social media avenues such as Twitter, Instagram, Facebook, email and blogs can be

sources of peer support in the online community (Greene et al., 2011; Kaufman, 2015).

Another recommendation would be that all medical providers should have their patients

complete the SSSI survey every year to assess what types of social support they feel they

are lacking. Individualization of diabetes management as recommended by the Standards

for Care in Diabetes can occur by collaborating with the patient to find a way to best

provide the support the individual patient is lacking in. This would provide additional

affectionate support from the healthcare provider.

Implications

The implications for this study are that since there is a relationship between levels

of functional social support ant performance of DSCAs, interventions should be focused

on alleviating those gaps in support to improve performance of DSCAs. A positive

statistically significant relationship has been confirmed in this study for informational

and affectionate support and performance of DSCA. Therefore, a potential implication of

this study is to create interventions that bolster informational support such as

recommending regular DSME for all African Americans diagnosed with diabetes. A

social media avenue can be another way to increase informational support by utilization

of the online diabetes community accessed via Twitter, Facebook, Instagram, email and

blogs (Greene et al., 2011; Kaufman, 2015). An additional implication for this study is

that since there is a positive relationship between affectionate support and performance of

DSCAs, one could request that a friend or family member accompany the person diagnosed with diabetes to their medical appointments to be able to provide the affectionate support that they need. In addition, people with diabetes can find additional peer support through social media such as Facebook, Twitter, Instagram, email and blogs (Greene et al., 2011; Kaufman, 2015). Healthcare providers should also check in with their patients on a regular basis to assess levels of perceived support and collaborate with their patient to meet their support needs.

The social change implications of this study are that the findings can be used to implement programs that could potentially have a positive effect on the performance of DSCAs. This study found that there was a positive relationship between affectionate support and informational support and performance of diabetes self-care behaviors in African Americans in San Francisco. The study also found that this sample of African Americans in San Francisco were not performing the recommended diabetes self-care behaviors at a high rate. A high rate would be considered to be performance of 5 or more of the behaviors 5 or more days per week or an SDSCA score of >50. The median score was 32 and only approximately 2% of the sample had a score of 50 or greater. Performance of DSCAs at a high rate has been shown to reduce complications, hospitalizations and ER admissions (Chow et al., 2011, Haas et al., 2014). Any intervention that could potentially increase performance of DSCAs could reduce rates of hospitalizations, ER admissions and complications in this population. Informational support and affectionate support were found to have a positive relationship to DSCAs. Increase of access to regular DSME and encouragement of family or friends, in

attendance at medical visits or DSME could improve levels of informational and affectionate support. Improvement of informational and affectionate support could improve levels of DSCAs and thus reduce hospitalizations, complications and ER visits in African Americans with diabetes in San Francisco. This could lead to improvements in patient outcomes and reducing health disparities in this population.

Conclusions

This study has shown a statistically significant relationship between informational support, affectionate support and DSCAs as measured on the SDSCA survey. There was also a negative relationship between practical support, emotional support and DSCAs as measured on the SDSCA, which however was not statistically significant. Based on this research and the literature it seems to partially support the idea of certain types of social support having a positive relationship with performance of DSCAs (DiMatteo & Miller, 2010). The majority of the literature supports the idea of composite social support having a positive relationship with performance of DSCAs (Miller & DiMatteo, 2010; Nicklett et al., 2013; Jalillian et al., 2014; Purcell et al., 2013; Rankin et al.,2014; Rosland et al., 2014; Song et al., 2012; Strom & Egede, 2013; Hill-Briggs et al., 2010). Rankin et.al.(2014) posit the idea that requirements for specific types of social support are individual and just asking the composite question of" Do you need social support?" Is insufficient and inefficient. Each individual has different requirements for quantity and types of social support (Rankin et al., 2014; Tang et al.,2008). The findings from this study show a strong relationship with informational support and performance of DSCAs. So establishment of local DSME opportunities and referring all African American

patients to regular classes would be good place to start to implement a potential intervention to increase informational support (Hill-Briggs et al., 2010). Social media is also a good venue to provide informational support through Facebook, Instagram, Twitter and email (Greene et.al., 2011; Kaufman, 2015).

Affectionate support also showed a strong positive relationship with performance of DSCAs. Interventions to improve levels of affectionate support would be inviting patients to bring a friend or family member to medical provider visits or to the DSME class. As well as create peer support groups for people with diabetes in the African American community. Referring African American people with diabetes to attend such groups on a regular basis with a friend or family member to boost that affectionate support. One can also use social media to add to levels of affectionate support by encouraging people with diabetes to find peer support groups online through Facebook, Instagram, Twitter, email and blogs (Greene et al., 2011; Kaufman, 2015). Most importantly though diabetes management should be individualized and boosting levels of social support can be an important positive avenue. Assess each patient individually on an annual basis using the SSSI survey and help them to assess the best way to improve whatever support they feel is lacking. With African American patients boosting levels of informational support and affectionate support could be a good place to start, but each patient should be individually assessed for their specific social support needs.

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https://www.takingcharge.csh.umn.edu/social-support

Appendix A: Rates of Diagnosed Diabetes by Race/Ethnicity

Figure 1. Rates of Diagnosed Diabetes by Race/Ethnicity

Rates of Diagnosed Diabetes

Race/Ethnicity	Rate
American Indians/ Alaskan Natives	15.9%
non-Hispanic blacks	13.2%
Hispanics	12.8%
Asian Americans	9.0%
non-Hispanic whites	7.6%
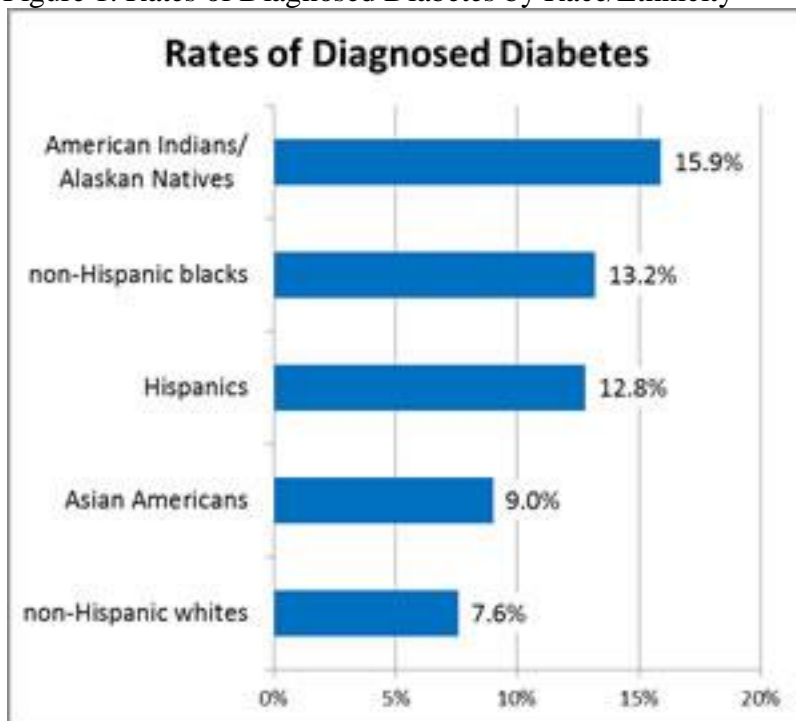
(American Diabetes Association {ADA}, 2015).

Appendix B: ADA Criteria for Diagnosis of Diabetes for Type 2 2010 Update

Table 1. ADA Criteria for Diagnosis of Diabetes for Type 2 2010 Update

	Pre-Diabetes	Diabetes
FPG*	100-125 mg/dL 5.6 mmol/L – 6.9 mmol/L	126 mg/dL and over 7.0 mmol/L and over
OGTT* after 75 g glucose load	140 mg/dL - 199 mg/dL 7.8 mmol/L – 11.0 mmol/L	200 mg/dL and over 11.1 mmol/L and over
A1c†	5.7 % - 6.4%	6.5% and over

*FPG and OGTT guidelines for GDM are different;†A1c does not apply to diagnosis of type 1 diabetes or to GDM.

Appendix C: Medical Outcomes: Study Social Support Survey Instrument

Permissions Information
All of the surveys from RAND Health are public documents, available without charge.
Translations
If you are interested in translating any surveys into another language, see our
translation guidelines.
Questions or Comments?
Email us at RAND_Health@rand.org

Medical Outcomes Study: Social Support Survey Instrument

People sometimes look to others for companionship, assistance, or other types of support.
How often is each of the following kinds of support available to you if you need it?
Circle one number on each line.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
Emotional/informational support					
Someone you can count on to listen to you when you need to talk	1	2	3	4	5
Someone to give you information to help you understand a situation	1	2	3	4	5
Someone to give you good advice about a crisis	1	2	3	4	5
Someone to confide in or talk to about yourself or your problems	1	2	3	4	5
Someone whose advice you really want	1	2	3	4	5
Someone to share your most private worries and fears with	1	2	3	4	5

Someone to turn to for suggestions about how to deal with a personal problem	1	2	3	4	5
Someone who understands your problems	1	2	3	4	5
Tangible support					
Someone to help you if you were confined to bed	1	2	3	4	5
Someone to take you to the doctor if you needed it	1	2	3	4	5
Someone to prepare your meals if you were unable to do it yourself	1	2	3	4	5
Someone to help with daily chores if you were sick	1	2	3	4	5
Affectionate support					
Someone who shows you love and affection	1	2	3	4	5
Someone to love and make you feel wanted	1	2	3	4	5
Someone who hugs you	1	2	3	4	5
Positive social interaction					
Someone to have a good time with	1	2	3	4	5
Someone to get together with for relaxation	1	2	3	4	5
Someone to do something enjoyable with	1	2	3	4	5
Additional item					
Someone to do things with to help you get your mind off things	1	2	3	4	5

Appendix D: Diabetes Care Profile

The Michigan Diabetes Research and Training Center (MDRTC) has developed several survey instruments for diabetes patients and health professionals. By downloading the forms you are agreeing to acknowledge the MDRTC as the source of the items in the survey instruments in any written instruments, reports, or publications resulting from their use or reproduction.

-

ID# _____

Name _____

Today's Date _____

Diabetes Care Profile

Michigan Diabetes
Research and Training Center
DCP2.0

Section I - Demographics

Please answer each of the following questions by filling in the blanks with the correct answers or by choosing the single best answer.

Note: For this survey, a <u>Health Care Provider</u> refers to a doctor, nurse practitioner,
or physician assistant.

Q1.   Age: __ __ years old

Q2.   Birth date: __ __ /__ __ /__ __
            (Month / Day / Year)

Q3.   Zip Code: __ __ __ __ __

Q4.   Sex: ☐₁ Male   ☐₂ Female

Q5.   What year were you first told you had diabetes? (Please enter the year) __ __ __ __

Q6.   What is your marital status? (check one box)

☐₁   Never married
☐₂   Married
☐₃   Separated/Divorced
☐₄   Widowed

Q7.   What is your ethnic origin/race? (check one box)

☐₁   White
☐₂   Black

☐₃ Hispanic

☐₄ Native American

☐₅ Asian or Pacific Islander

☐₆ Arabic

☐₇ Other _____

Q8. Where do you live most of the year? (check one box)

- ☐₁ Your home, apartment or condo
- ☐₂ Senior citizen apartment/condo
- ☐₃ Home of a relative/friend
- ☐₄ Retirement home
- ☐₅ Adult foster care
- ☐₆ Nursing home
- ☐₇ Other _____

Q9. How many people live with you? (check one box)

- ☐₀ I live alone
- ☐₁ 1 person
- ☐₂ 2 people
- ☐₃ 3 people
- ☐₄ 4 people
- ☐₅ 5 or more

Q10. How much schooling have you had? (Years of formal schooling completed)
(check one box)

- ☐₁ 8 grades or less
- ☐₂ Some high school
- ☐₃ High school graduate or GED
- ☐₄ Some college or technical school
- ☐₅ College graduate (bachelor's degree)
- ☐₆ Graduate degree

Q11. Which of the following best describes your current employment status? (check one box)

     ☐₁ Working full-time, 35 hours or more a week

     ☐₂ Working part-time, less than 35 hours a week

     ☐₃ Unemployed or laid off <u>and</u> looking for work

     ☐₄ Unemployed <u>and not</u> looking for work

     ☐₅ Homemaker

     ☐₆ In school

     ☐₇ Retired

     ☐₈ Disabled, not able to work

     ☐₉ Something else? (Please specify): _____

Q12. How would you describe the insurance plan(s) you have had <u>in the past 12 months</u>?
     (check all that apply)

     ☐₁   An individual plan – the member pays for the plan premium

     ☐₂   A group plan through an employer, union, etc. – the employer pays all or part

         of the plan premium

     ☐₃   U.S. Governmental Health Plan (e.g., Military, CHAMPUS, VA)

     ☐₄   Medicaid

     ☐₅   Medicare

     ☐₆   I have not had an insurance plan in the past 12 months

Q13. What type(s) of insurance plans have you had <u>in the past 12 months</u>? (check all that apply)

☐₁ <u>Indemnity</u> or <u>fee-for-service</u> plan (i.e., you choose which health care provider you

see for care without financial penalty)

☐₂ <u>Health Maintenance Organization</u> (HMO) (i.e., you must have a primary care

provider who must refer you to specialty care if needed)

☐₃ <u>Preferred Provider Organization</u> (PPO) (i.e., you have lower co-payments when

you see a preferred provider within the network, but you can see a provider

out-of-network for a higher co-payment)

☐₄ <u>Point of Service</u> (POS) (i.e., you must have a primary care provider; you have the

option to self-refer to an in-network specialist, or you can see an out-of-network

specialist with a higher co-payment)

☐₅ Other (please specify): _____

☐₆ I have not had an insurance plan in the past 12 months.

Q14. Do you test your blood sugar? (check one box)

☐₁ No   ☐₂ Yes ──────► Q14a. How many days a week do you

test your blood

sugar?

_____ (days / week)

Q14b. On days that you test, how many times do you test
your blood sugar?

_____ (times / day)

Q14c. Do you keep a record of your

blood sugar test

results? (check one box)

☐₁ No   ☐₂ Yes   ☐₃
Only Unusual

Values

Addition to Section I (Demographics) - Income Question

Q15. Which of the categories best describes your total annual <u>combined</u>
household income from <u>all</u> sources? (check one box)

☐₀₁ Less than $5,000

☐₀₂ $5,000 to $9,999

☐₀₃ $10,000 to $14,999

☐ 04 $15,000 to $19,999

☐ 05 $20,000 to $29,999

☐ 06 $30,000 to $39,999

☐ 07 $40,000 to $49,999

☐ 08 $50,000 to $59,999

☐ 09 $60,000 to $69,999

☐ 10 $70,000 and over

Section II – Health Status

Q1. In general, would you say your health is: (check one box)

☐₁   ☐₂   ☐₃   ☐₄   ☐₅

Excellent   Very Good   Good   Fair   Poo

Q2. These questions ask about how you feel and how things have been with you **during the**
       past 4 weeks. For each question, please give the one answer that comes closest to the
       way you have been feeling.

       How much of the time **during the past 4 weeks**: (circle one answer for each line)

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
A. Have you felt **calm and peaceful**?	1	2	3	4	5	6
B. Did you have a **lot of energy**?	1	2	3	4	5	6
C. Have you felt **downhearted and blue**?	1	2	3	4	5	6

Section III – Education / Advice Received

Q1.   Has your health care provider or nurse ever told you to take special care of your feet?
        (check one box)

        ☐₁ No   ☐₂ Yes   ☐₃ Not Sure

Q2.   Has your health care provider or nurse ever told you to follow an exercise program?
        (check one box)

        ☐₁ No   ☐₂ Yes   ☐₃ Not Sure

Q3.   Has your health care provider or nurse ever told you to follow a meal plan or diet?
        (check one box)

        ☐₁ No   ☐₂ Yes   ☐₃ Not Sure

Q4.   Have you ever received diabetes education? (for example: attended a series of classes or
        series of meetings with a diabetes educator) (check one box)

        ☐₁ No   ☐₂ Yes   ☐₃ Not Sure

Section IV - Understanding

Q1.	How do you rate your understanding of: (circle one answer for each line)	Poor		Good		Excellent
	a) overall diabetes care	1	2	3	4	5
	b) coping with stress	1	2	3	4	5
	c) diet for blood sugar control	1	2	3	4	5
	d) the role of exercise in diabetes care	1	2	3	4	5
	e) medications you are taking	1	2	3	4	5
	f) how to use the results of blood sugar monitoring	1	2	3	4	5
	g) how diet, exercise, and medicines affect blood sugar levels	1	2	3	4	5
	h) prevention and treatment of high blood sugar	1	2	3	4	5
	i) prevention and treatment of low blood sugar	1	2	3	4	5
	j) prevention of long-term complications of diabetes	1	2	3	4	5
	k) foot care	1	2	3	4	5
	l) benefits of improving blood sugar control	1	2	3	4	5
	m) pregnancy and diabetes	1	2	3	4	5

Section V – Support

Q1. I **want** a lot of help and support from my family or friends in:
(circle one answer for each line)

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree	Does Not Apply
a) following my meal plan.	1	2	3	4	5	N/A
b) taking my medicine.	1	2	3	4	5	N/A
c) taking care of my feet.	1	2	3	4	5	N/A
d) getting enough physical activity.	1	2	3	4	5	N/A
e) testing my sugar.	1	2	3	4	5	N/A
f) handling my feelings about diabetes.	1	2	3	4	5	N/A

Q2. My family or friends help and support me a lot to:
(circle one answer for each line)

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree	Does Not Apply
a) follow my meal plan.	1	2	3	4	5	N/A

		1	2	3	4	5	N/A
b)	take my medicine.	1	2	3	4	5	N/A
c)	take care of my feet.	1	2	3	4	5	N/A
d)	get enough physical activity.	1	2	3	4	5	N/A
e)	test my sugar.	1	2	3	4	5	N/A
f)	handle my feelings about diabetes.	1	2	3	4	5	N/A

Q3.   My family or friends: (circle one answer for each line)

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
a) accept me and my diabetes.	1	2	3	4	5
b) feel uncomfortable about me because of my diabetes.	1	2	3	4	5
c) encourage or reassure me about my diabetes.	1	2	3	4	5
d) discourage or upset me about my diabetes.	1	2	3	4	5
e) listen to me when I want to talk about my diabetes.	1	2	3	4	5
f) nag me about diabetes.	1	2	3	4	5

Q4.   Who helps you the **most** in caring for your diabetes? (check only one box)

☐1 Spouse
☐2 Other family members
☐3 Friends
☐4 Paid helper
☐5 Doctor
☐6 Nurse
☐7 Case manager
☐8 Other health care professional
☐9 No one

Appendix E: Summary of Diabetes Self Care Activities

Deborah Toobert

to me

Dear Liseli, I am sending this twice, as I think you are not receiving my emails.

Thank you for your payment of $25 on February 8,2016 for permission to use the Summary of Diabetes Self Care Activities (SDSCA) in your study. Now that we have received your payment, you have our permission to use the English version of the Summary of Diabetes Self-Care Activities Questionnaire in your research project and we will be able to provide answers to any questions you may have. We have attached the 2000 Diabetes Care article with the SDSCA psychometric information. At the end of the article, there is an appendix with the English version of the questionnaire, and the scoring information. We have also attached a user-friendly copy of the English version of the SDSCA instrument.

If you need a translation of the SDSCA please contact me first, as the SDSCA has been translated into many languages.

Please be sure to check our website first for the most frequently asked questions:

http://www.ori.org/sdsca

We wish you every success with your research,
Deborah

Summary of Diabetes Self-Care Activities Questionnaire

The questions below ask you about your diabetes self-care activities during the past 7 days. If you were sick during the past 7 days, please think back to the last 7 days that you were not sick.

Diet

<u>Number of Days</u>

1. How many of the last SEVEN DAYS have you followed a healthful eating plan?

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

2. On average, over the past month, how many DAYS PER WEEK have you followed your eating plan?

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

3. On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

4. On how many of the last SEVEN DAYS did you eat high-fat foods, such as red meat or full-fat dairy products?

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

Physical Activity

5. On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity?

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

(Total minutes of continuous activity, including walking).

6. On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

Blood Sugar Testing

7. On how many of the last SEVEN DAYS did you test your blood sugar?

Number of Days

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

8. On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health-care provider?

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

Foot Care

9. On how many of the last SEVEN DAYS did you check your feet?

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

10. On how many of the last SEVEN DAYS did you inspect the inside of your shoes?

☐0 ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7

Smoking

11. Have you smoked a cigarette, even a puff, in the past SEVEN DAYS?

☐0 No   ☐1 Yes ≡   11a. How many cigarettes

did
you smoke on an

average day?

Number of cigarettes:

_____

Additional Items for the Expanded Version of the
Summary of Diabetes Self-Care Activities

Self-Care Recommendations

1A.   Which of the following has your health-care team (doctor, nurse, dietitian, or diabetes
educator) advised you to do? *Please check all that apply.*

☐a   Follow a low-fat eating plan

☐b   Follow a complex carbohydrate diet

☐c   Reduce the number of calories you eat to lose weight

☐d   Eat lots of food high in dietary fiber

☐e   Eat lots (at least 5 servings per day) of fruits and vegetables

☐f   Eat very few sweets (for example, desserts, non-diet sodas, candy bars)

☐g   Other (*specify:*

_____)

☐h   I have not been given any advice about my diet by my health-care team

2A.   Which of the following has your health-care team (doctor, nurse, dietitian, or diabetes

educator) advised you to do? *Please check all that apply.*

☐a   Get low level exercise (such as walking) on a daily basis

☐b   Exercise continuously for a least 20 minutes at least 3 times a week

☐c   Fit exercise into your daily routine (for example, take stairs instead of elevators,

park a block away and walk, etc.)

☐d   Engage in a specific amount, type, duration, and level of exercise

☐e   Other (*specify:*

_____)

☐f   I have not been given any advice about exercise by my health-care team

3A.   Which of the following has your health-care team (doctor, nurse, dietitian, or diabetes

educator) advised you to do? *Please check all that apply.*

☐a   Test your blood sugar using a drop of blood from your finger and a color chart

☐b   Test your blood sugar using a machine to read the results

☐c   Test your urine for sugar

☐d　　Other (*specify:*
_____)

☐e　　I have not been given any advice about my blood or urine sugar level by my
　　　　health-care team

4A.　Which of the following medications for your diabetes has your doctor prescribed?
　　　Please check all that apply.

☐a　　An insulin shot 1 or 2 times a day

☐b　　An insulin shot 3 or more times a day

☐c　　Diabetes pills to control my blood sugar level

☐d　　Other (*specify:*
_____)

☐e　　I have not been prescribed either insulin or pills for my diabetes

Diet

5A.　On how many of the last SEVEN DAYS did you space carbohydrates evenly through
　　　the day?

☐0　　☐1　　☐2　　☐3　　☐4　　☐5　　☐6　　☐7

Medications

6A.　On how many of the last SEVEN DAYS, did you take your recommended diabetes
　　　medication?

☐0   ☐1   ☐2   ☐3   ☐4   ☐5   ☐6   ☐7

OR

7A.   On how many of the last SEVEN DAYS did you take your recommended insulin
      injections?

☐0   ☐1   ☐2   ☐3   ☐4   ☐5   ☐6   ☐7

8A.   On how many of the last SEVEN DAYS did you take your recommended number of
      diabetes pills?

☐0   ☐1   ☐2   ☐3   ☐4   ☐5   ☐6   ☐7

Foot Care

9A.   On how many of the last SEVEN DAYS did you wash your feet?

☐0   ☐1   ☐2   ☐3   ☐4   ☐5   ☐6   ☐7

10A. On how many of the last SEVEN DAYS did you soak your feet?

☐0   ☐1   ☐2   ☐3   ☐4   ☐5   ☐6   ☐7

11A. On how many of the last SEVEN DAYS did you dry between your toes after washing?

☐0   ☐1   ☐2   ☐3   ☐4   ☐5   ☐6   ☐7

Smoking

12A. At your last doctor's visit, did anyone ask about your smoking status?

☐0 No ☐1 Yes

13A. If you smoke, at your last doctor's visit, did anyone counsel you about stopping
smoking or offer to refer you to a stop-smoking program?

☐0 No ☐1 Yes ☐2 Do not smoke

14A. When did you last smoke a cigarette?

☐a More than two years ago, or never smoked

☐b One to two years ago

☐c Four to twelve months ago

☐d One to three months ago

☐e Within the last month

☐f Today

Scoring Instructions for the Summary of Diabetes Self-Care Activities

Scores are calculated for each of the five regimen areas assessed by the SDSCA: Diet, Exercise, Blood-Glucose Testing, Foot Care, and Smoking Status.

Step 1

For items 1–10, use the number of days per week on a scale of 0–7. Note that this response scale will not allow for direct comparison with the percentages provided in Table 1.

Step 2: Scoring Scales

General Diet = Mean number of days for items 1 and 2.

Specific Diet = Mean number of days for items 3 and 4, reversing item 4 (0=7, 1=6, 2=5, 3=4, 4=3, 5=2, 6=1, 7=0). Given the low inter-item correlations for this scale, using the individual items is recommended.

Exercise = Mean number of days for items 5 and 6.

Blood-Glucose Testing = Mean number of days for items 7 and 8.

Foot Care = Mean number of days for items 9 and 10.

Smoking Status = Item 11 (0 = nonsmoker, 1 = smoker) and number of cigarettes smoked per day.

Scoring for Additional Items

Recommended Regimen = Items 1A–4A and items 12A–14A, no scoring required.

Diet = Use total number of days for item 5A.

Medications = Use item 6A *OR* 7A AND 8A. Use total number of days for item 6A; use mean number of days if both 7A and 8A are applicable.

Foot Care = Mean number of days for items 9A–11A, after reversing 10A and including items 9 and 10 from the brief version.