USING A SOCIAL ECOLOGICAL MODEL IN PREDICTING TYPE 2 DIABETES SELF-CARE IN RURAL AFRICAN AMERICAN WOMEN

by

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(Under the Direction of Dr. Stephanie Burwell)

ABSTRACT

Rural African American women in Georgia have a disproportionate prevalence rate of diabetes, which nearly doubled in the past 30 years. Self-care behaviors, such as healthy eating, physical activity, foot care, and monitoring blood glucose levels, are important in the long-term prognosis of the disease. Using a social ecological model and stress coping theory, I examined the pathways in which community disadvantage, social support, and depressive symptoms are linked to type 2 diabetes self-care in women. Specifically, I hypothesized that community disadvantage would affect women’s self-care by increasing depressive symptoms and that social support would ameliorate the influence of community disadvantage on depressive symptoms. Hypotheses were tested with data from 140 rural African American women diagnosed with type 2 diabetes. As hypothesized, community disadvantage was linked to type 2 diabetes self-care and this association was mediated through depressive symptoms. No evidence was found to support the moderating influence of social support on the association between community disadvantage and depressive symptoms. Interventions are needed to decrease depressive symptoms and increase community support for rural African American women with type 2 diabetes.

INDEX WORDS: diabetes; self-care; African Americans; rural; social ecological theory
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CHAPTER 1

Introduction

Type 2 Diabetes: Pathophysiology and Prevalence

Diabetes is a group of chronic diseases that lead to high blood glucose levels as a result of difficulty with insulin secretion and/or insulin action (Center for Disease Control [CDC], 2007). Insulin is a hormone that helps to break down glucose for energy (American Diabetes Association, 2010). In type 2 diabetes, the body cannot produce and use insulin properly, and this leads to high blood glucose levels. In 2010, 1.9 million people were diagnosed with diabetes (American Diabetes Association, 2011). Type 2 diabetes or non-insulin-dependent diabetes mellitus is usually diagnosed in adulthood and comprises 90-95% of all diabetes cases in the US (CDC, 2007).

Type 2 Diabetes: Morbidity, Mortality, and Economic Burden

Diabetes can lead to major complications such as heart disease, stroke, high blood pressure, blindness, kidney disease, nervous system disease (neuropathy), or amputation (American Diabetes Association, 2005). These complications contributed to 231,404 deaths in 2007 (American Diabetes Association, 2011). They also create economic burden. The average financial responsibility for health care is 2.3 times higher for patients diagnosed with diabetes (American Diabetes Association, 2011).

Importance of Behavioral Self-care Regimens in Preventing Complications

Risk factors for type 2 diabetes complications include lack of physical activity, poor diet, obesity, poor care of feet, and alcohol and tobacco use (CDC, 2009b). These risk factors are
highly modifiable through self-care regimens. Prescribed self-care behaviors include specific diet recommendations, exercise, smoking cessation, foot care, and monitoring and testing of blood glucose levels. Diets that are low in fat and regular exercise help to regulate blood glucose levels. Smoking cessation decreases risk for complications, and adequate foot care helps to increase circulation to the limbs. Testing blood glucose levels alerts the patient of changes in blood glucose (American Diabetes Association, 2005; American Diabetes Association, 2011). Research evidence suggests (Diabetes Control and Complications Trial) that persons with type 2 diabetes who maintain healthy blood glucose values through self-care behaviors are unlikely to experience many of the problems associated with diabetes. However, adhering to these self-care behaviors is difficult and involves committing to several lifestyle changes.

**Rural African American Women, Type 2 Diabetes, and Self-care Behaviors**

The burden of diabetes affects women, African Americans, and rural residents disproportionately. Diabetes is more common among women than men, and the number of women diagnosed with type 2 diabetes is increasing at a more rapid rate (CDC, 2006). Women are especially vulnerable to diabetes complications, and are more likely than men to develop fatal coronary heart disease and blindness as a result of type 2 diabetes (CDC, 2008; Huxley, Barzi, & Woodward, 2006). Engaging in diabetes self-care to reduce this risk of complications can also be difficult for women. They experience higher expectation of fulfilling care-taking responsibilities, which may decrease time for self-care behaviors. They also have decreased equal employment and salary opportunities when compared to men, and may not have as many financial resources to provide adequate diabetes self-care (Hannan, 2009).

Almost twice as many African Americans are diagnosed with diabetes than Caucasian women (Carter, Pugh, & Monterrosa, 1996). When compared to white women, African
American women with type 2 diabetes have poorer glycemic management, higher mortality rates, and more complications such as amputations, heart disease, and blindness (Carter et al., 1996; Gu, Cowie, & Harris, 1998; Harris, Eastman, Cowie, Flegal, & Eberhardt, 1999; Konen, Summerson, Bell, & Curtis, 1999). The reasons for these disparities are unclear. It has been suggested that exposure to discrimination, higher rates of single female-headed households, increased poverty levels, and higher caretaker demands when compared to other ethnicities may influence African American women’s vulnerability to disease (McLaughlin & Sachs, 1988).

Rural residence has been identified as a risk factor diabetes and diabetes related complications. Rural residents experience unique economic, educational, transportation, mental health, and employment challenges that increase vulnerability to chronic disease (McLaughlin & Sachs, 1988; Ramsey & Glenn, 2002). Women in rural areas are particularly vulnerable to the onset of type 2 diabetes, and exhibit difficulty in managing the disease (Ramsey & Glenn, 2002). The prevalence rate of complications is significantly higher among rural African Americans when compared to urban African Americans, rural Caucasians, or urban Caucasians (Mainous, King, Garr, & Pearson, 2004). Mainous and colleagues recently reported that 9.5%, of rural African American have type 2 diabetes, a rate higher than any other region in the United States (Mainous et al., 2004).

These data underscore the vulnerability of rural African American women to diabetes and diabetes related complications and the need to investigate the factors that facilitate or impede their involvement in self-care behaviors. To date, little research has addressed the correlates of self-care among these women. This dissertation is designed to meet that need.
Hypothesized Pathways to Self-Care Behaviors

To date, very little research has been conducted that examines why rural African Americans take better or worse care of themselves. Although studies have described interventions for type 2 diabetes self-care among Caucasian women (Sorensen, Emmons, Hunt, & Johnston, 1998; van Dam et al., 2005) and some research for African American women (Keyserling et al., 2002), these findings are not necessarily generalizable to rural African American women. By understanding the larger social and ecological context of rural African Americans managing type 2 diabetes, researchers and interventionists can further the development of culturally sensitive programs tailored to rural African American women with type 2 diabetes.

This study examined intrapersonal, interpersonal, and community factors that are hypothesized to influence type 2 diabetes self-care among rural African American women. Social ecological theory, stress coping theory, and existing research guided variable selection. A conceptual model was developed that summarizes hypothesized associations; it is presented in detail in Chapter 2. It is hypothesized that contextual factors (e.g., community disadvantage and social support) influence depressive symptoms. Specifically, I expect that community disadvantage will directly predict depressive symptoms and that social support will attenuate the influence of community disadvantage on depressive symptoms. Depressive symptoms, in turn lead to less self-care behaviors, mediating the community disadvantage to self-care path.

Hypotheses were tested with data from 140 rural African American women with type 2 diabetes that participated in the Families, Communities, and Diabetes Management Project (FAMCDM; e.g., Kogan, Brody, & Chen, 2009; Kogan, Brody, Crawley, Logan, & Murry, 2007). FAMCDM included measures of type 2 diabetes self-care behaviors, demographic
characteristics, depressive symptoms, social support, and community disadvantage. Hypotheses were tested using Structural Equation Modeling (SEM). Analyses of study hypotheses are described in Chapter 3.
CHAPTER 2
Literature Review

Diabetes Overview

Nearly 8% of the United States population suffers from diabetes. Diabetes is a group of diseases that occur as a result of problems with glucose metabolism, which influences how food is broken down into glucose. Glucose is the primary fuel for cells. Insulin is a hormone that comes from the pancreas and triggers the body’s cells to allow glucose to enter them. In individuals with diabetes, either the cells do not respond to insulin or inadequate amounts of insulin are produced. The insulin that is produced passes out of the bloodstream and is excreted in the individual’s urine, so energy from the glucose is lost (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2008).

Symptoms of type 2 diabetes include frequent urination, loss of energy, increased hunger and thirst, changes in vision, weight loss, and decelerated healing of cuts or scrapes (NIDDK, 2008). Doctors diagnose diabetes by measuring patients’ fasting blood glucose, oral glucose tolerance, and/or the blood glucose level of a patient. Different types of diabetes include type 1, type 2, and gestational diabetes. The majority of cases are type 2 diabetes where the pancreas produces adequate amounts of insulin, but the body is resistant to the insulin. This resistance typically increases over time. After continued insulin resistance, the body eventually reduces production of insulin requiring treatment regimens similar to those of type 1 diabetics (American Diabetes Association, 2005; NIDDK, 2008).
As the seventh leading cause of death, diabetes is a chronic and serious illness with life-threatening complications. When too much glucose is in the blood, the small blood vessels that transport blood become clogged and circulation is damaged. Problems with vision, fatigue, numbness in hands or feet, chest pain when engaging in activity, and slow healing wounds are signs of type 2 diabetes complications (American Diabetes Association, 2005). Complications include blindness, stroke, heart and blood vessel disease, amputations, kidney disease and failure, nerve damage, and complications with pregnancy. Women who have type 2 diabetes also have a higher risk of miscarriage and birth defects when pregnant. Finally, risk for comorbid diagnosis of cardiovascular disease is high, and approximately 65% of patients with type 2 diabetes develop cardiovascular disease (NIDDK, 2008). Risk factors for type 2 diabetes complications include obesity, history of gestational diabetes, family history of diabetes, lack of physical activity, and older age.

Several doctors and specialists are consulted when developing a treatment plan for an individual diagnosed with type 2 diabetes. The health care team usually features a combination of the following providers: primary care provider, endocrinologist, dietitian or diabetes educator, podiatrist, and an ophthalmologist or optometrist. The primary care provider manages the type 2 diabetes in combination with other health concerns, and the dietitian or diabetes educator has special knowledge about diabetes management for the patient. The endocrinologist is the diabetes specialist. The podiatrist administers and monitors foot care, and the ophthalmologist or optometrist cares for the patient’s eyes. Depending on the patient’s needs, other specialists may be contacted as collaborators to join the treatment team. For example, a woman with type 2 diabetes may wish to consult with an obstetrician before conceiving a child to determine benefits and risks to pregnancy (NIDDK, 2008). As a result, specialists should ideally communicate
together in a collaborative healthcare model to optimize treatment planning and implementation for the patient.

**Diabetes Management and Self-Care Behaviors**

When the health care team establishes a treatment plan, they emphasize that type 2 diabetes management is important in decreasing risk of developing complications (American Diabetes Association, 2005). Management of type 2 diabetes should combine medication use and diabetes self-care behaviors. Medication and/or insulin are used to regulate blood glucose (NIDDK, 2008). These medications help the patient to monitor blood glucose levels. Blood glucose levels that are too high or low are unhealthy for the patient. In addition, behavioral changes are also essential to the treatment plan. Self-care behaviors for diabetes management include nutrition, exercise, foot care, smoking cessation, and monitoring and testing of blood glucose levels (Toobert, Hampson, & Glasgow, 2000).

Nitrition is an essential component of type 2 diabetes self-care because diet affects blood glucose levels. Eating a balanced amount of carbohydrates, proteins, and fat helps to keep blood glucose levels down and should be considered a lifestyle change instead of a diet. Patients should create a meal plan and consider family food traditions, cooking preferences, scheduling, and how often he/she eats outside of the home. By measuring blood glucose levels 1-2 hours after a meal, patients can begin to find out how certain foods influence their blood glucose levels and alter their meal plan according to the results (American Diabetes Association, 2005; NIDDK, 2008).

Consistent exercise decreases chances of type 2 diabetes complications and improves overall health. Exercise aids patients in increasing energy, losing weight, and using glucose from the blood, which facilitates regulation of blood glucose levels. On days when patients exercise, they often use less insulin and are able to eat more calories per day. Exercising need not be as
strenuous as running, but should increase the patient’s heart rate. It is recommended at least 4-5 days a week for at least 30 minutes each exercise session. Occasionally, a healthy nutrition plan and regular exercise lessens or eliminates the need for insulin. It may also result in fewer medications for patients with type 2 diabetes, which reduces financial burden on the patient (American Diabetes Association, 2005; NIDDK, 2008).

Daily foot care keeps potential foot problems under control. Patients with diabetes are susceptible to poorer blood circulation and nerve disease in the body’s extremities. Feet should be cleaned every day and examined for areas of redness, cuts, breaks in the skin, and overly cold (symptoms of poor circulation) or warm (symptom of infection) areas. Also, trimming toenails, buying proper fitting shoes, and socks that increase circulation in the extremities are suggestions for preventing foot problems. Small sores, calluses, or numbness with the feet should be examined immediately by a doctor (American Diabetes Association, 2005; NIDDK, 2008).

Smoking causes several health issues, and in addition to lung disease, smoking damages the heart and circulatory system and increases risk of type 2 diabetes complications. The blood vessels begin to narrow and blood flow to the cells is decreased. The cells may die, which over time may lead to heart disease or limb amputation. Smoking cessation can begin to immediately lower additional risk of circulatory complications (American Diabetes Association, 2005; NIDDK, 2008).

Finally, monitoring blood glucose levels is important as blood glucose levels change throughout the day. In general, food, stress, and illness increase blood glucose and insulin, diabetes medication, and exercise decrease blood glucose levels. Chronic high blood glucose levels increase risk for complications, and very low blood glucose levels may result in lethargy, unconsciousness, or even death if it is not regularly monitored and managed. Monitoring of
blood glucose levels alerts the patient of how they need to manage their blood glucose level so that it remains close to a normal blood glucose range (American Diabetes Association, 2005; NIDDK, 2008).

The Diabetes Control and Complications Trial and United Kingdom Prospective Diabetes Study revealed that a healthy blood glucose level via medication use and type 2 diabetes self-care behaviors slowed the progression of complications associated with type 2 diabetes (American Diabetes Association, 2005). In 2002, the Diabetes Prevention Program Research Group published a longitudinal study in which 3,234 patients with elevated blood glucose concentrations were randomly assigned to a placebo, metformin (medication to lower blood glucose), or a lifestyle modification program targeting nutrition and physical activity. The incidence of diabetes diagnosis was 11.0, 7.8, and 4.8% respectively. These studies suggest that a combination of medication and lifestyle changes to increase healthy self-care behaviors may slow or reduce development, progression, and complications associated with type 2 diabetes (Diabetes Prevention Program Research Group, 2002).

Although the benefits of engaging in self-care behaviors has been established in the literature, the adherence of patients to prescribed self-care behaviors is largely unknown (National Institute of Diabetes and Digestive and Kidney Diseases, 2007; Schoenberg, Traywick, Jacobs-Lawson, & Kart, 2008). Studies have supported that patients adhere consistently with doctor’s recommendations for physician appointments and medication use. Generally, patients adhered to medication use approximately 77-97% of the time and monitored their blood glucose levels as requested by their doctor (Piette et al., 2003; Ruggiero et al., 1997). However, patients struggled with adhering to treatment plan recommendations for diet, exercise, and foot care. In the same studies referenced above for medication adherence, 3-28% adhered to diet and 12-45%
adhered to exercising daily (Piette et al., 2003; Ruggiero et al., 1997; Schoenberg et al., 2008). This rate is alarmingly low considering the benefits of engaging in type 2 diabetes self-care behaviors.

Conceptual Model

Although it is unclear why some individuals engage in type 2 diabetes self-care behaviors more than others, it is clear that rural African American women have a unique context that make engaging in type 2 diabetes self-care behaviors more difficult. Rural African American women experience many stressors as a result of racial discrimination and daily stress that must be considered when theorizing how women engage in self-care behaviors (Uttal, 2009). Stress coping and social ecological theories, taken together, offer a lens from which to understand type 2 diabetes self-care behaviors in rural African American women and goes beyond intrapersonal factors to include contextual factors influential in understanding type 2 diabetes self-care behaviors. Figure 1 (page 20) shows the conceptual model guiding the remainder of the literature review.

Factors that influence self-care behaviors are multi-systemic. Ecological theory examines issues from multiple contexts such as an individual’s microsystem, mesosystem, and macrosystem. A microsystem involves an individual and his or her immediate surroundings such as the nuclear family, and a mesosystem are those structures that connect the individual to other relationships such as a school to a parent and child. A macrosystem is the larger sociocultural context that influences each system. Two other systems to consider are the exosystem, which is the structures that influence the individual indirectly such as a parent’s work demands or community level resources; and, the chronosystem, which considers the timing of events over the life course (Bronfenbrenner, 1979; Bronfenbrenner, 1986). Ecological models of type 2 diabetes
self-care posit that interpersonal characteristics such as social support and macro-level characteristics such as community disadvantage influence personal characteristics such as depressive symptoms, which in turn influence type 2 diabetes self-care (Farmer, Jackson, Camacho, & Hall, 2007; Haque & Telfair, 2000; Morris, 2006; Telfair, Haque, Etienne, Tang, & Strasser, 2003).

In addition to social ecological theory, stress coping theory offers an additional lens from which to understand type 2 diabetes self-care behaviors (Lazarus, 1993). Coping is defined as continual cognitive and behavioral processing in response to a particular demand that is intended to manage psychological stress. Stress coping theory indicates that coping should be understood within the context of the situation in which it occurs. In other words, it should be considered within the context of the particular person, stressor, and environment in which that individual resides. Many rural African American women report disadvantages they endure when living in the rural communities. In disadvantaged communities, mounting stressors influence psychological functioning (Cutrona et al., 2005; Lazarus, 1993). Consistent with the literature on stress coping theory, social support is modeled in this study as a buffer to negative psychological functioning. Therefore, these mounting stressors are seen to indirectly influence type 2 diabetes self-care behaviors. These contextual factors will be reviewed further in this chapter with emphasis on how they conceptually fit into the model.

Community Disadvantage and Depressive Symptoms

Communities have advantages and disadvantages. On the one hand, advantaged communities are described as containing clean, safe, well-maintained homes, and respect for community members (Ross, 2000). However, disadvantaged communities struggle with physical, structural, and functional problems (Cutrona, Wallace, & Wesner, 2006). As stated, many rural
African American women report disadvantages in their rural communities (Hacque & Telfair, 2000; Telfair et al., 2003). Hence, community disadvantage is one factor that should be considered when modeling type 2 diabetes self-care behaviors among rural African American women.

Physical characteristics are those basic characteristics of a community such as housing, and also include resources such as public transportation, hospitals, doctors’ offices, grocery stores, and retail stores (Cutrona et al., 2006). The ease in which residents feel they have access to basic physical characteristics in a neighborhood impacts their daily stress through negotiation of time management. Rural African American women report they lack these basic physical characteristics and have to travel further to purchase necessities and attend doctor’s appointments and lack adequate safety resources. When traveling further for necessities, additional resources such as child-care and transportation costs are then needed. More time spent traveling decreases time for self-care behaviors. In addition to travel and time management, inadequate police protection and insufficient lighting in the streets are a concern. When attempting to purchase groceries, medications, fuel for vehicles, and other daily essentials, these physical characteristics are important in decreasing fear of danger (Cutrona et al., 2006; Robert & Reither, 2004; Yen & Kaplan, 1998).

Structural characteristics of a community are measured by the amount of community members with low socioeconomic status, low levels of education, and/or who experience discrimination based on ethnic or racial minority status (Cutrona et al., 2006). Racism and sexism influence structural characteristics and put rural African American women in a vulnerable position. It impacts their economic and educational opportunities and effects opportunities for employment, education, health insurance, and equal pay, which reinforce these rates. This leads
to an increased sense of helplessness, frustration, and hopelessness, which is expected when attempting to escape structural disadvantages in a community (Cutrona et al., 2006; Robert & Reither, 2004).

Functional community characteristics refer to the amount of dangerous or unlawful behavior committed in a neighborhood. Vandalism, drug sales, crime, and general social disorder are all functional disadvantages in a neighborhood (Cutrona et al., 2006; Robert & Reither, 2004). Signs of disorder raise concerns for individual and family safety, and rural African American women have reported they feel at increased risk of danger, unsafe leaving their home, and discomforted and hypervigilant in their home in functionally disadvantaged neighborhoods (White, Kasl, Zahner, & Will, 1987). These signs of social disorder add to feelings of helplessness, because few community members are motivated to maintain order (Cutrona et al., 2006). Communities with physical, structural, and functional problems are stressful to live in and increase feelings of hopelessness and frustration.

Negative psychological consequences in disadvantaged communities put residents at higher risk for depressive symptoms (Cutrona et al., 2006). When comparing African American women who experience major stressors in advantaged versus disadvantaged neighborhoods, those in disadvantaged neighborhoods experienced more major depressive episodes (12% when compared to 2% of advantaged community members). Considering physical, structural, and functional characteristics together, this is likely due to lack of resources, support, and norms that support feelings of helplessness. In addition, many disadvantaged communities lack healthy models of coping with stressors (Cutrona et al., 2006; Elliott, 2000). Lack of a healthy support system and models for coping are often due to less community ties in disadvantaged neighborhoods. Resident turnover is often frequent, social disorder is high, and mistrust is
prevalent among neighbors. The lack of community fellowship results in less informal social control (e.g., reporting risky adolescent behaviors to parents or calling authorities when noticing suspicious behavior) and less positive models of behavior and coping for other community members (Cutrona et al., 2006).

Depressive symptoms may interfere in several areas of an individual’s life (Cutrona et al., 2006; Elliott, 2000). Depression is a short or long term disturbance of mood lasting at least two weeks, which ranges from dysthymia to major depressive disorder. It carries symptoms such as sadness, lethargy, feelings of worthlessness, trouble concentrating, problems with sleep and appetite, guilt, ahedronia, suicide ideation and other problems. To be clinically significant, depression impacts daily activities, routine, and interferes with work, education, health practices, families, couples, and/or relationships (American Psychological Association, 2000).

Individuals with type 2 diabetes are twice as likely to have depression and report depressive symptoms than individuals without a major health problem both before and after diagnosis (Anderson, Freedland, Clouse, & Lustman, 2001; Musselman, Betan, Larsen, & Phillips, 2003). In non-clinical populations, the prevalence of depression is higher for women with 5-9% of women compared to approximately 18% of women diagnosed with type 2 diabetes (American Psychological Association, 2000; Anderson et al., 2001). As many as 28% of women compared with 18% of men have been comorbidly diagnosed with type 2 diabetes and depression (Anderson et al., 2001; Heisler et al., 2007; Pouwer & Snoek, 2001). Evidence suggests that being female, an ethnic minority, and living in a rural community are all risk factors for depressive symptoms among type 2 diabetes patients.

Depressive symptoms may influence type 2 diabetes self-care behaviors. Research examining depressive symptoms and type 2 diabetes self-care behaviors show that patients who
are suffering from more depressive symptoms have more emergency room visits, more medical inpatient hospital services, higher blood pressure, higher blood cholesterol, and more problems with glycemic control when compared to individuals with chronic diseases that report higher mental health functioning (Katon et al., 2005; Lustman et al., 2000; Shih & Simon, 2008; Zhang et al., 2005). After controlling for sociodemographic and physical health variables, type 2 diabetes patients who were clinically depressed as measured by the Center for Epidemiologic Studies Depression scale had 54% higher mortality risk than those individuals not clinically depressed (Zhang et al., 2005). It is plausible, given these trends, that depressive symptoms compromise self-care behaviors (Lustman et al., 2000; Zhang et al., 2005).

In this dissertation, depressive symptoms are proposed as a mediator between community disadvantage and type 2 diabetes self-care. Living in a disadvantaged neighborhood has been associated with unhealthy self-care behaviors. For example, fear of safely leaving the home may impact options for increasing physical activity. Lower physical activity and higher BMI are disproportionately cited in disadvantaged neighborhoods when controlling for income, education, smoking, and alcohol intake (Ramsey & Glenn, 2002; Yen & Kaplan, 1998). However, this link is better understood in the conceptual model by considering depressive symptoms as a mediator between community disadvantage and type 2 diabetes self-care behaviors. Research suggests that disadvantaged communities increase risk of depressive symptoms. These depressive symptoms lead to lower self-care behaviors, and therefore community disadvantage indirectly impacts self-care behaviors (McLaughlin & Sachs, 1988; Yen & Kaplan, 1998; Ramsey & Glenn, 2002).
Social Support as a Moderator between Community Disadvantage and Depressive Symptoms

Not all individuals experience depressive symptoms when living in a disadvantaged community. Protective processes are often evident that buffer or weaken the strength of the relationship between community disadvantages and depressive symptoms. Social support is proposed as a protective processes that attenuates depressive symptoms among women living in disadvantaged communities (Gerstle, Varenne, & Contento, 2001). Social support includes offering resources, empathy, or help with coping with stress. Types of social support include instrumental, emotional, and informational support. Instrumental support consists of helping to solve a problem such as finding transportation to a therapy appointment or helping with childcare when attending a doctor’s appointment. Emotional support includes offering support through listening, empathy, or encouragement. Finally, providing advice or sharing one’s own experience with a certain topic may offer informational support (Schwarzer & Knoll, 2007). A caregiver, family member, friend, and others can assist an individual in coping with daily or acute stressors they experience as a result of community disadvantages.

Social support is important among African American women residing in rural areas as they have reported that they felt less supported in rural communities when compared to urban areas (Morris, 2006). They may need additional social support. African Americans, in particular, have strong kinship bonds between family members that often extend beyond that of most white families (Abernethy, Houston, Mimms, & Boyd-Franklin, 2006). These bonds can extend beyond the family’s blood relatives to include other members that the family considers “brothers” or “sisters.” These kinship networks are known for providing and receiving support from one another in times of stress. This can be seen as a strength of rural African American women, as extended family may provide this source of social support. Identified support persons
can provide instrumental support such as transportation, child-care assistance, or emotional support such as assurance or validation (Dilworth-Anderson, 1992). For example, it is not uncommon for grandparents to help raise grandchildren. Some family members or close friends may even informally “adopt” certain children to help serve as a positive role model and caregiver for the child to help a single parent or aid with type 2 diabetes self-care behaviors (Abernethy et al., 2006).

Women are more likely to seek out social support as a coping mechanism for stress (Eagly & Crowley, 1986; Swickert & Owens, 2010; Taylor et al., 2000). For example, in response to a stressor such as divorce, women were more likely than men to turn to their support persons to cope (Prezza & Pacilli, 2002). This is important in that support can be offered, but unless the support is received by the person, it may never benefit the person (Schwarzer & Knoll, 2007). One challenge for women is caregiver burden and putting the needs of others before themselves. Many rural African American women take on primary caretaking responsibilities and have difficulty putting their needs first and asking for help when needed. In a study of gender differences affecting low-income women’s ability to manage cardiovascular disease, researchers reported that some women felt as if they were burdening their support persons by asking for help. Instead of confiding in a support person, some women would not talk about their disease to family members or an identified support person (Mead, Andres, Katch, Siegel, & Regenstein, 2010).

Social support serves as a potential moderating variable that is influential in reducing stress and depressive symptoms in conjunction with physical, structural, and functional community disadvantages that have an impact on type 2 diabetes self-care behaviors in rural African American women (Doeglas et al., 2004; McCaul, Glasgow, & Schafer, 1987; Sanderson,
Littleton, & Pulley, 2002; Williams & Bond, 2002). When considering that rural African American women are at higher risk of living in a disadvantaged community, social support is one resource that may act as a buffer to the stress that accumulates in response to living in a disadvantaged community, thereby decreasing development of depressive symptoms in rural African American women.

In sum, rural African American women with type 2 diabetes encounter challenges and resources related to type 2 diabetes self-care behaviors. Social ecological factors such as community disadvantages, social support, and depressive symptoms may influence type 2 diabetes self-care behaviors in rural African American women (McCaul et al., 1987). A path model of direct, indirect, and moderational influences is located in Figure 1 (page 21). Social ecological and stress coping theories guided the research questions by modeling how interpersonal, intrapersonal, and community factors can be accounted for in examining the relationships of psychosocial factors to type 2 diabetes self-care behaviors in rural African American women.
Figure 1. Conceptual Model.
CHAPTER 3

Methods

Research Hypotheses

The present study was designed to test a model of the influences of psychological and contextual processes on diabetes self-care behaviors among rural African American women with type 2 diabetes. Hypotheses were tested with data from 140 rural African American women with type 2 Diabetes. Based on the literature review and the theoretical model described earlier, I hypothesize the following:

1. More community disadvantage will predict less self-care behaviors.
2. More community disadvantage will predict more depressive symptoms.
3. More depressive symptoms will predict less self-care behaviors.
4. Community disadvantage will have an indirect negative influence on self-care behaviors through depressive symptoms.
5. The relationship between community disadvantage and depressive symptoms will be moderated by social support, such that in the presence of higher social support, community disadvantage will have less of an influence on depressive symptoms.

Sample

Women participating in the FAMCDM study comprised the sample for this study. Participants were recruited from eight rural counties in central Georgia. Several recruitment methods were used to accrue study participants. Participants were recruited through physicians and health care providers, churches, businesses, and other social services departments that
assisted the African American community in the area. Community members received information about the project from research staff. If community members were interested, a research staff member contacted them with more information about the study. Inclusion criteria for the study were (a) self-identified African American, (b) age 40-65 years, (c) diagnosed with type 2 diabetes within the past 10 years, (d) currently receiving treatment with a health care provider, and (e) able to identify an adult support person in the same area who was willing to participate. Of the 309 individuals contacted by the research team, 204 (66%) met the inclusion criteria; four of these individuals declined to participate. Of the 200 participants, 140 (67%) were women. Participants were given $80 for their participation in the study.

Procedure

The FAMCDM Project protocols were approved by The University of Georgia Institutional Review Board. To enhance rapport and cultural understanding, African American university students and community members served as field researchers to collect data. They received 28 hours of training in administering the protocol. At the home visit, field researchers obtained written consent from the participants. Participants then participated in a survey interview. Field researchers brought a laptop computer equipped with Computer Assisted Interviewing (CAI) software. In this method, one question shows up on the computer screen at a time, and is read by the interviewer who inputs the participant’s response. The use of CAI creates an easy interview pace; reduces missing data due to skipped questions, out-of-range responses, and inconsistent answers; and, increases administration consistency. When responses to a Likert-type scale were required, participants were shown a card with a series of dots in graduated sizes that corresponded to the magnitude of the responses from which they were to choose and were asked to indicate their feelings using the dots on the card. Field researchers received ongoing
quality control monitoring throughout the data collection period.

Measures

The measures and items relevant to these analyses are described below beginning with the dependent variable. All measures except the Center for Epidemiological Depression Scale are included in the Appendix (this scale is excluded for copyright law).

*Diabetes self-care*

Self-care behaviors were measured using the Diabetes Self-Care Inventory (Toobert et al., 2000). This 11-item measure assesses how often patients engaged in specific self-care activities. Responses ranged from “0 days” to “7 days a week,” and an example is “On how many of the last seven days did you test your blood sugar?” Questions related to nutrition, exercise, blood glucose monitoring, smoking, and checking feet were included. Subscales were obtained by using a sum score. A review of seven studies using the measure showed adequate test-retest reliability and validity of the scale and subscales (Toobert et al., 2000); FAMCDM sample reliability was $\alpha = .63$.

*Community Disadvantage*

Community disadvantage was measured using the Community Deviance Questionnaire (CDQ; Simons et al., 1995). This 11-item questionnaire assesses crime and disorganization in a community on a 4-point Likert scale ranging from “not a problem” to “a big problem.” An example is, “How big of a problem is it in your neighborhood for vacant or deserted houses or storefronts?” This measure has been used with rural African American families. Previous studies report adequate reliability and validity scores (Simons, R. L. et al. 1995), and good reliability was observed in this study ($\alpha = .91$).
**Social support**

The Social Provisions Scale for Families was used to measure supportive behaviors from an identified support person (Cutrona & Russel, 1987). The scale included 7 items and contains 2 subscales: positive social provisions and negative social provisions. A total score was used for this study and negative social provisions were reverse coded. Each question was measured on a 4-point Likert scale ranging from “strongly disagree” to “strongly agree”. Participants filled in the name of an identified support person for each question. Examples include, “You can depend on ________ to help you if you really need it” and “You feel you could not turn to ________ for guidance in times of stress.” This scale has acceptable reliability in previous research (Cutrona & Russel, 1987) as well as in this study ($\alpha = .75$).

**Depressive Symptoms**

The Center for Epidemiologic Studies Depression Scale (CES-D) measures depressive symptoms during the past week, and has been used with rural African American population (Brody & Flor, 1997). This 20-item scale measured responses from 0-3 about a certain symptom of depression from “rarely or none of the time” to “most or all of the time.” The answers are then summed to create a continuous score ranging from 0 to 60 with higher scores indicating more depressive symptoms. This scale has been widely used and has adequate psychometric properties (Radloff, 1977). The reliability in this study was good ($\alpha = .87$).

**Demographic Variables**

Participants reported on their relationship status (never married, married, separated/divorced, or widowed), education (8 grades or less, some high school, high school graduate or GED, some college or technical school, college graduate, or graduate degree), and
employment (earning money inside the home, outside the home, both, or not earning money). They also reported their age (in years), date of diagnosis, and household income.

**Plan of Analyses**

Using the Statistical Package for the Social Sciences 18.0 (SPSS), descriptive statistics were examined to confirm the suitability of variable distributions for modeling procedures. We evaluated the hypotheses presented in Figure 1 (page 21) using Structural Equation Models (SEM) using AMOS 18 software. Models were estimated with maximum likelihood. In order to achieve adequate power for the analysis, Peyrot (1996) suggests that individuals using path analysis should have a minimum of 10 cases per parameter in the model. Therefore, a sample size of \( n = 140 \) is considered acceptable for this study. There were six parameters in the most complex model. Control variables (income, education, and age were tested) were included in initial models and retained if they were significant \( (p < .05) \). These were included to control for variability in demographic characteristics. Overall model of fit was assessed using several indices. The Goodness of Fit Index (GFI), root mean square error of approximation (RMSEA), and Comparative Fit Index (CFI) assessed model fit (Hu & Bentler, 1999). Although chi-square is helpful in determining overall fit of the model, it is highly influenced by sample size and covariance matrices. As such, GFI and CFI were also included to determine appropriate fit of the model because they are based on chi-square. Finally, the RMSEA was used because sample size is not needed in calculating this model fit and does not carry the same bias as the other fit indices (Hu & Bentler, 1999). In this study, a cut-off value of \( > .9 \) was used for CFI (Hu & Bentler, 1999), \( < .06 \) for RMSEA (Hu & Bentler, 1999), and \( > .9 \) for GFI (Kline, 2005). The model in Figure 1 was evaluated in 4 steps to permit determination of direct and indirect effects.
**Step 1: Baseline**

I specified a baseline model to test the direct effects of community disadvantage on self-care behaviors controlling for education, income, and age. Although not shown in Figure 2, all exogenous variables were correlated.

![Diagram of baseline path model]

Figure 2. Baseline path model.

**Step 2: Intermediate Tests of Indirect Effects**

In order to investigate the indirect effects of community disadvantage on type 2 diabetes self-care, the following intermediate steps were required (Baron & Kenny, 1986; MacKinnon & Luecken, 2008; Preacher, Rucker, & Hayes, 2007). Intermediate steps b and c are shown in Figure 3.

a. Step 1 is significant (community disadvantage on self care; see Figure 2)

b. Community disadvantage will predict more depressive symptoms

c. More depressive symptoms will predict less self-care behaviors.
Figure 3. Model of intermediate steps b and c.

Step 3: Mediation Analysis

Figure 4 presents the specification for a mediational model. To confirm mediation, given significant findings in step 2, the inclusion of the mediator should attenuate the significance of the baseline association and demonstrate a significant indirect path (Baron & Kenny, 1986).
AMOS uses bootstrapping of the standard errors of the indirect effects to provide significance levels. Bootstrapping was performed by using a “pseudo-population” to represent the population, which was obtained from the sample in the study. Significance of indirect effects was determined from bias-corrected confidence intervals, and a $p$ value of less than .05 was used to determine significance for the analysis (Shrout & Bolger, 2002).

*Step 4: Multi-group Analysis*

To test the hypothesis that social support will moderate the influence of community disadvantage on depressive symptoms I used multi-group modeling (Bollen, 1989; Preach, Rucker, & Hayes, 2007). Social support was divided into higher social support and lower social support using a median split. I then estimated a two-group invariance model by imposing equality constraints on every parameter. Next, the regression parameter linking community disadvantage and depressive symptoms equality constraint was relaxed, allowing the coefficient...
to differ across groups, and the model was re-estimated. If the coefficients differed across groups, relaxing the equality constraint would result in a significant improvement in fit (Bollen, 1989; Preacher et al., 2007) and indicate that social support conditions the link between community disadvantage and depressive symptoms (see Figure 5).

Higher Social Support

![Diagram of higher social support path model]

Lower Social Support

![Diagram of lower social support path model]

Figure 5. Path model of multi-group analysis.
CHAPTER 4

Results

The results are divided into 5 sections: a) participant characteristics, (b) baseline modeling, (c) intermediate tests of indirect effects, (d) mediation analysis, and (e) multi-group analysis corresponding to Chapter 3. Section one provides results pertaining to participant characteristics.

Participant Characteristics

Participant characteristics are presented in Table 1.

Table 1

*Characteristics of the Sample (N = 140)*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n(%)</th>
<th>Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td>52.8(6.7)</td>
<td>27</td>
</tr>
<tr>
<td>Age at diagnosis</td>
<td></td>
<td>48.1(7.3)</td>
<td>32</td>
</tr>
<tr>
<td>Educational attainment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 grades or less</td>
<td>7.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some high school</td>
<td>27.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school graduate or GED</td>
<td>28.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college or technical school</td>
<td>27.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College graduate</td>
<td>5.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characteristic</td>
<td>Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate degree</td>
<td>3.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>17.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>37.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated/divorced</td>
<td>32.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>11.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not employed</td>
<td>47.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed inside home</td>
<td>3.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed outside home</td>
<td>47.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed in/out home</td>
<td>1.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly income</td>
<td>$1230.45($593.11) $3053.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-care Behaviors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat fruits/veggies (0-14)</td>
<td>8.9(3.8) 14.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat and exercise (0-28)</td>
<td>15.1(5.4) 23.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test blood sugar (0-14)</td>
<td>11.3(3.5) 14.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test feet (0-14)</td>
<td>9.8(4.5) 14.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoked in past 7 days</td>
<td>13.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive social provisions (0-9)</td>
<td>7.7(1.2) 5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative social provisions (0-12)</td>
<td>2.6(2.5) 11.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressive symptoms*</td>
<td>13.4(9.6) 42.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Total resources (0-76) & 38.6(13.3) & 74.0 \\

*A score of 16 or higher is considered clinically significant for depression.

**Normality of Data**

Means and standard deviations were examined for normality. Mean, standard deviations, skew, and kurtosis of scales are included in Table 2. A normally distributed variable would have a skewness of 0. The further a measure is from 0, the more skewness in the measure. For skewness and kurtosis, any value between -1.0 and +1.0 was considered acceptable (Huck, 2004). All of the scales fell within this range on skew and kurtosis and therefore were considered appropriate for SEM.

**Table 2**

*Summary of Normality of Data*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Scale M</th>
<th>Scale SD</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes Self-Care</td>
<td>46.54</td>
<td>10.65</td>
<td>-.38</td>
<td>-.25</td>
</tr>
<tr>
<td>Community Disadvantage</td>
<td>8.49</td>
<td>6.78</td>
<td>.84</td>
<td>.04</td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>13.49</td>
<td>9.57</td>
<td>.76</td>
<td>-.09</td>
</tr>
<tr>
<td>Social Support</td>
<td>17.14</td>
<td>3.09</td>
<td>-.33</td>
<td>-.94</td>
</tr>
<tr>
<td>Community Resources</td>
<td>43.76</td>
<td>11.36</td>
<td>-.04</td>
<td>.20</td>
</tr>
</tbody>
</table>
Means and Standard Deviations

Means and standard deviations of the independent variables are summarized in Table 1. The Diabetes Self-care Activities (DSC) was measured by total score and by domain. The DSC total score ranged from 0-77 where higher scores indicated more self-care behaviors, and was equally distributed across the range. Most participants reported self-care behaviors in each domain for at least 4 out of 7 days of the week for eating fruits and vegetables (M = 4.4 days), following a healthy diet and exercising (M = 3.8 days), testing blood sugar (5.7 days), and testing feet (4.9 days). Most participants did not report smoking in the past 7 days (86.4%).

Correlations

Correlations among study variables are presented in Table 3.

Table 3

*Correlations of Independent and Dependent Variables (N = 140)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Diabetes Self-Care</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Community Disadvantage</td>
<td>-.13</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Depressive Symptoms</td>
<td>-.15</td>
<td>.34*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Social Support</td>
<td>.08</td>
<td>-.07</td>
<td>-.17*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Current Age</td>
<td>.13</td>
<td>.03</td>
<td>-.11</td>
<td>-.05</td>
<td>_</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Monthly Income</td>
<td>-.06</td>
<td>-.16</td>
<td>-.18</td>
<td>.15</td>
<td>-.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Education</td>
<td>-.16*</td>
<td>-.25*</td>
<td>-.25*</td>
<td>.15</td>
<td>.42*</td>
<td>.10</td>
<td>_</td>
</tr>
</tbody>
</table>

*p < .05
SEM Analyses

The model was evaluated in 4 steps to permit determination of direct and indirect effects.

Step 1: Baseline Model

In step 1, I specified a baseline model to test the direct effects of community disadvantage on diabetes self-care behaviors controlling for education, income, and age. Nonsignificant (p > .05) associations among exogenous variables were deleted from the model. Because the control variable education was significantly associated with type 2 diabetes self-care, it was retained in the model. Income and age were dropped from the model. This model was saturated, so there was no chi-square and the other indices were equal to one. Beta weights for the baseline model are included in Figure 6. More reported community disadvantage was associated with a decrease in diabetes self-care behaviors (β = -.20, p < .05), more education was associated with less diabetes self-care behaviors (β = -.21, p < .05), and higher community disadvantage was associated with less education (β = -.25, p < .05). In sum, hypothesis 1 was confirmed and there was a direct effect between community disadvantage and diabetes self-care behaviors.

*p < .05

Figure 6. Standardized beta weights for baseline path model (N = 140).
Step 2: Intermediate Tests of Indirect Effects

In step 2, intermediate tests were required to investigate the indirect effects of community disadvantage on type 2 diabetes self-care behaviors. Test “a” was confirmed from step 1, which stated that community disadvantage would have a significant direct effect on diabetes self-care. Step “b” required that community disadvantage predict more depressive symptoms. This was also confirmed ($\beta = .30, p < .05$). Finally, step “c” indicated that more depressive symptoms would predict less diabetes self-care behaviors, which was supported ($\beta = -.19, p < .05$). Therefore, hypotheses 2-3 were confirmed.

Step 3: Mediation Analysis

Given significant findings from step 2, we tested the mediating effect of depressive symptoms. The influence of education on diabetes self-care and on depressive symptoms was controlled. The final model is presented in Figure 7. The model was saturated, so there was no chi-square statistic, and other fit indices were equal to one. The path from community disadvantage to diabetes self-care behaviors was attenuated from the baseline model ($\beta = -.14, p > .05$), which indicates that depressive symptoms may partially mediate the association between type 2 diabetes self-care behaviors and community disadvantage. The indirect effect was $B = -.06$ indicating that for each unit change in community disadvantage, self-care behavior was reduced 6% due to the indirect influence of depressive symptoms. Boot strapping revealed this indirect effect was significant ($p < .05$)
Figure 7. Path model testing the indirect effect of community disadvantage on diabetes self-care behaviors.

*Step 4: Multi-group Analysis*

In step 4, I tested the hypothesis that social support would moderate the influence of community disadvantage on depressive symptoms. Using multi-group comparison in AMOS 18, all parameters in the two groups (higher social support and lower social support) were constrained to be equal except for the path linking community disadvantage and depressive symptoms. A model comparison test showed the two groups were not statistically different \((p = .75)\). Thus, we found no evidence that social support moderated the association between community disadvantage and depressive symptoms.
CHAPTER 5

Discussion

Summary of Key Findings

The objective of this study was to use social ecological and stress coping theory to investigate the role of depressive symptoms and community disadvantage in determining type 2 diabetes self-care behaviors among rural African American women. Many rural African American women report disadvantages they endure when living in the rural communities. In disadvantaged communities, mounting stressors influence psychological functioning (Cutrona et al., 2005; Lazarus, 1993). Consistent with the literature on stress coping theory, social support is modeled in this study as a buffer to negative psychological functioning. Therefore, these mounting stressors are seen to indirectly influence type 2 diabetes self-care behaviors. Previous research examining type 2 diabetes self-care behaviors has not given adequate attention to this particular population (Keyserling et al., 2002; Sorensen et al., 1998; van Dam et al., 2005). Therefore, hypotheses examined intrapersonal, interpersonal, and macro-level factors and were tested as follows: (a) community disadvantage will directly and indirectly (via depressive symptoms) influence the difficulty of type 2 diabetes self-care behaviors and (b) social support would moderate the association between community disadvantage and depressive symptoms. The discussion of key findings below is organized as follows: (a) engagement in diabetes self-care behaviors; (b) experience of depressive symptoms; and, (c) significant hypothesized associations in the conceptual model.
Diabetes Self-Care

Type 2 diabetes self-care behaviors include blood glucose monitoring, diet, exercise, smoking cessation, and checking feet. Studies have shown that persons with type 2 diabetes report the most difficulty with diet, exercise, and checking the inside of their shoes (Lin et al., 2004; Sanderson et al., 2002). Women in this study reported attending to these self-care behaviors more days than not in the week; a finding higher than that suggested by the literature (Lin et al., 2004; Mainous et al., 2004). Study participants followed a healthy diet and exercise plan about 4 days per week, tested their blood sugar and feet/shoes approximately 5 days a week, and most (86%) did not smoke at all during the past week. As others have suggested, women are generally engaging in type 2 diabetes self-care behaviors for part of the week, but not every day (Lin et al., 2004; Mainous et al., 2004). Consistent with other studies measuring type 2 diabetes self-care in white and minority samples, rural African American women are not consistently engaging in diabetes self-care behaviors.

Depressive Symptoms

Past studies indicate that the prevalence of depression in patients with type 2 diabetes is nearly twice as high as those without a major medical issue (Anderson et al., 2001; Bell et al., 2005). Two cross-sectional studies with over 4700 combined participants found that approximately 14% of women reported depressive symptoms using the Patient Health Questionnaire. Approximately 80% of the other study’s sample was white, so African Americans (8.3%) were not equally measured for comparison. In another study using the CES-D with somewhat equally distributed ethnicity, 21% of the sample reported depressive symptoms (Bell et al., 2005). The women in FAMCDM reported a mean score of 13.4, which was approximately 2.5 points below clinical significance. Depressive symptoms may be elevated among rural
African American women with type 2 diabetes. These differences may be attributable to a number of risk factors for depression that rural women experience such as increased risk for poverty, barriers to help seeking, fewer resources, unemployment, low self-esteem, and health status (de Groot, Auslander, Williams, Sherraden, & Haire-Joshu, 2003; Kogan et al., 2007).

**Influence of Community Disadvantage on Depressive Symptoms**

Disadvantaged rural communities have less police protection, insufficient lighting in the streets, and fewer resources to safely purchase groceries and necessities (Robert & Reither, 2004; Yen & Kaplan, 1998). Participants reported several community disadvantages that may have had an impact on their psychological well-being including selling and using drugs by community members; litter, broken glass, or trash on the sidewalks or streets; vacant or deserted houses or storefronts; drinking in public; and, groups of teenagers or adults hanging out in the neighborhood and causing trouble. This is consistent with research findings that African American women who live in rural communities experience many of the same problems related to crime and community disorganization as women in urban settings (Cutrona et al., 2005).

Study findings confirmed that community disadvantages were associated positively with depressive symptoms such that more community problems led to more depressive symptoms. Similar to other studies (McLaughlin & Sachs, 1988; Ramsey & Glenn, 2002), chronic stressors such as such as found in disorganized communities are linked to negative psychological consequences. Past studies have also supported community disadvantage as an antecedent to depression, which are independent of other types of individual stressors (Cutrona et al., 2006; Simmons et al., 2008).
**Influence of Depressive Symptoms on Type 2 Diabetes Self-Care Behaviors**

This study found a negative link between depressive symptoms and diabetes self-care such that more depressive symptoms were associated with less self-care behaviors. This finding is consistent with past research on Caucasian and non-rural women (Lin et al., 2004; Ramsey & Glenn, 2002).

**Depressive Symptoms as a Partial Meditational Process**

Findings also support an indirect link from community disadvantage to type 2 diabetes self-care behaviors through depressive symptoms. This suggests that depressive symptoms may explain, in part, how community disadvantage affects diabetes self-care. As previously discussed, higher community disadvantages put residents at risk for depressive symptoms. These depressive symptoms may lead to decreased self-care behaviors. However, no clear temporal causal assumptions should be drawn from this research since it is a cross-sectional study. This pattern is consistent with prospective research by McKellar et al. (2004) who found that depressive symptoms influenced glycemic control through patient ability to adhere to diabetes self-care behaviors.

**Influence of Social Support as a Moderator**

Participants identified a support person for the purposes of the study. I hypothesized that social support from this person may attenuate the influence of community disadvantage on depressive symptoms. This hypothesis was not supported by the data. This was potentially a power issue. Each group had approximately 70 participants while testing six paths. It met minimum requirements for running the analysis, but should be replicated with a larger sample.
The Influence of Education

Although not a focus of the study hypotheses, education level, a control variable, had a robust influence on diabetes self-care behaviors. In contrast to past research, higher levels of education were linked with reduced self-care behavior (Kawachi, Adler, & Dow, 2010). Reverse causation may be occurring where the association may actually be that poorer health may limit educational attainment and potential for employment. Without further research, caution should be taken when interpreting this result and more research should be conducted specifically focusing on educational attainment and type 2 diabetes self-care behaviors. This was not the focus of this study.

Conclusion

Study results are notable for several reasons. Most notably, I am aware of no prior studies that have investigated the influence of contextual factors on type 2 diabetes self-care behaviors among rural African American women. The present findings also support development of preventative interventions targeting rural African American women’s type 2 diabetes self-care behaviors. Studies targeting urban African Americans for intervention development are emerging (Cohen et al., 2003; Fryers, Melzer, & Jenkins, 2003), yet may not be generalizable to rural African Americans. Location, high poverty rates, low educational attainment, few resources, and caregiver burden are issues that may be different for rural African American women (McLaughlin & Sachs, 1988; Ramsey & Glenn, 2002).

Clinical Implications

The present study suggests that rural African American women live in an environment that is not conducive to type 2 diabetes self-care behaviors. Implications that attend to rural residence, ethnicity, and gender within a familial context are essential in understanding and
intervening with this population (Few, 2009). They should target depression screening, educating community members on the link between depressive symptoms and type 2 diabetes self-care behaviors, training doctors and nurses, and referring patients to family therapy in rural communities.

**Depression Screening**

This study supported that depressive symptoms have a role in type 2 diabetes self-care behaviors. In addition, rural residents experience unique economic, educational, transportation, mental health, and employment challenges that increase vulnerability to depressive symptoms (McLaughlin & Sachs, 1988). Interventionists should increase screening for depression and raise community awareness of the link between diabetes and depressive symptoms. Those patients with depressive symptoms could be identified and receive additional resources to manage symptoms. Sometimes identifying depression earlier may slow or reverse its progression if treated (Kemppainen et al., 2009). Doctors and nurses are ideal professionals to screen for depressive symptoms since they are managing the type 2 diabetes.

**Collaboration with Healthcare Professionals**

Type 2 diabetes patients will already be attending doctor’s appointments. Training of doctors to screen for and address psychological concerns should begin in medical school and continue throughout their career in workshops and/or conferences. Training in communication and interpersonal skills is vital to building and maintaining the physician-patient relationship throughout treatment.

The doctor-patient relationship is important in dealing with depressive symptoms and type 2 diabetes management and control (Davey & Watson, 2008). Doctors can sometimes appear very direct and forceful in communication style, while African Americans are more likely
to have indirect and accommodating communication styles (Davey & Watson, 2008). Many clients may have trouble being assertive and asking questions of their doctor to receive more information or get a second opinion. However, by encouraging patients to voice their concerns, patients may feel more comfortable disclosing their symptoms, at which time the doctor may refer them to a counselor or therapist.

*Psychoeducation*

As with many chronic illnesses, psychoeducation is also important in helping patients understand the link between depressive symptoms and type 2 diabetes self-care behaviors. In several studies, women reported wishing they had more knowledge pertaining to treatment options, medication, and mental health concerns. With knowledge of what type 2 diabetes is, management options, and how they may have an affect on a client’s mental health, clients may make informed decisions pertaining to treatment and recovery (Burwell, Templeton, Kennedy, & Zak-Hunter, 2008; Gould, Grassau, Manthorne, Gray, & Fitch, 2006). This can be done in doctor’s offices or hospitals through nurses and health educators following diagnosis of type 2 diabetes.

*Marriage and Family Therapy*

Given the barriers to mental health care and the strengths of African American families, Marriage and Family Therapy (MFT) is uniquely suited to explore emotional and relational strains within a medical context. Complementary to social ecological theory, Marriage and Family Therapists focus on family systems and the larger sociocultural context instead of solely on the individual. For example, rural African American women are thought of within the racism they endure. As Silverstein explains (2003), some individuals blame single mothers for their economic instability, but instead an MFT should see single African American mothers within the
context of a racist society. This unique stance allows for a view that considers the context of African American women that have type 2 diabetes from rural communities (Silverstein, 2003). They can focus on the client’s mental health issues within the context of her/his chronic disease while also collaborating with doctors, health providers, and pastors or clergy. Since clients may have trouble with access to mental health care, therapists may choose to offer in-home therapy, have a second office in the rural town, have appointments at local churches, or work in a hospital where clients dealing with chronic illness will already be attending appointments (Hovestadt, Fenell, & Canfield, 2002). Relational therapists have specialized knowledge and experience with helping couples and families deal with chronic disease control and management where therapists can help family members explore how difficult environments contribute to depressive symptoms and problems with diabetes self-care behaviors (Walsh, Manuel, & Avis, 2005).

Medical family therapy is an emerging field that is particularly suited to enact these implications. Medical family therapy is an approach that evolved from Engel’s (1977) biopsychosocial model and emphasizes collaboration between health care professionals and agency and communion with patients suffering from type 2 diabetes (McDaniel, Hepworth, & Doherty, 1992). Engel (1977) originally proposed the biopsychosocial model as he believed that the dominant biomedical model overlooked psychosocial factors that are important in explaining illness. He proposed that the psychological and relational domains of illness in conjunction with the biomedical model, could better explain illness and its effect on the patient. Agency refers to commitment and involvement with one’s illness. Communion is the support needed by family, friends, and the health care system in coping with an illness. Oftentimes chronic diseases such as type 2 diabetes can give patients a sense of loss of control over their bodies, but medical family therapists can help patients to find agency in decision making pertaining to disease management.
and control. This perspective can be used in conjunction with any MFT model (McDaniel et al., 1992).

When working with rural African American populations, culturally sensitive medical family therapy is that therapy that addresses chronic diseases in a culturally competent and sensitive manner. Therapists who are culturally competent must continually examine their own biases, educate themselves about vulnerable populations, and actively work towards becoming a culturally sensitive therapist (Abernethy et al., 2006; Boyd-Franklin et al., 1997; Dana, 2002; Whaley, 2001). Several MFT models have been used theoretically with African American samples. However, there are no known studies specifically testing the efficacy of any one model with a solely African American sample (Boyd-Franklin, 1987; Hines & Boyd-Franklin, 2005).

Rural African American clients may benefit from strength-based therapy that differs from the usual role of oppression that the African American woman experiences (Hines & Boyd-Franklin, 2005; Silverstein, 2003). Silverstein (2003) explains that many African American women believe the system of oppression they are in and blame themselves for issues within the couple or family system. Some African American women believe their strength in the family helps them to survive, and therefore feel responsible for the well being of the family. This caregiver burden can come at the expense of the individual’s own care of their type 2 diabetes (Hall & Green, 2003). Therapy can take a different approach by taking the one-down approach mentioned above to help to liberate women from the role they are used to and by focusing on strengths and community resources (e.g., educational facilities, safe houses, etc.; Silverstein, 2003) to empower women to attend to their own rights and needs without feeling guilty (Hall & Green, 2003).
To summarize, rural African Americans are especially vulnerable to health disparities such as diabetes, and organizations have been urging researchers to address this gap in the literature (CDC, 2009a). Research is complex, but socioeconomic status, racism, institutional mistrust, attitudes about health, and access to healthcare all are influential in development of health disparities. Type 2 diabetes is influenced by depressive symptoms, and medical family therapy is uniquely situated to collaborate with the health care team and to address the mental health care needs of this population. Although recommendations covered here have started to be implemented by other researchers, further implementation of recommendations will help to close the gap on health disparities and validate other studies (Vellozzi et al., 1996).

Limitations

Even though this study has contributed to the literature on type 2 diabetes self-care by offering a unique sample of rural African American women, several limitations should be considered when interpreting the findings. These limitations include the cross-sectional data, self-report measures, reliability of the Summary of Diabetes Self-Care Activities Scale, and generalizability from the sample to the population.

First, this study is cross-sectional, and therefore cannot be interpreted longitudinally to validate direction of effects. Longitudinal data can measure several time points throughout the life course of the participant. Although the direct of effects was grounded in the literature, longitudinal data would provide more sound evidence of direction of effects.

Second, using all self-report measures may have limitations. The participant may bias their responses based on what they think others want them to say, may unintentionally give misinformation, or may become tired and make careless errors. For example, the researchers used self-report to identify participants with type 2 diabetes. To increase reliability, they required
the diagnosing physician’s name and date of diagnosis. However, a chance still remains that the participant could have incorrectly reported their diagnosis when they actually had type 1 diabetes or had symptoms of type 2 diabetes but were not enough to be diagnosed.

Third, the Summary of Diabetes Self-Care Activities Scale had reliability lower than .7. Results must be considered within this context and should be replicated with a larger sample size to increase the reliability of results for the sample. Another suggestion would be to use the longer form of the Summary of Diabetes Self-Care Activities measure (Toobert et al., 2000). Although this study did not incorporate the long form, this form of the assessment may have more reliable results.

Finally, the research team originally recruited participants from physician’s offices. However, the physicians were inconsistent in recruiting participants. Therefore, community recruitment strategies were used in which self-selection bias could be an issue where people who self-select themselves may share a certain number of characteristics that may have biased the sample.

Despite its limitations, this study has contributed to the type 2 diabetes literature by providing a unique sample that has been rarely studied in conjunction with type 2 diabetes self-care. It has provided evidence to support the role of contextual factors in indirectly influencing type 2 diabetes self-care through depressive symptoms. By using SEM, relationships between several variables were assessed at once, which can inform treatment planning for patients with type 2 diabetes.

**Future Directions**

The limitations previously discussed should be attended to in future research. A large longitudinal study assessing rural African American women over time would be able to help
validate the direction of effects. Ideally, a study in a physicians office that tracks rural African American women over time may provide information before their diagnosis to look at pre-diabetes environment and determine patterns of type 2 diabetes self-care independent of type 2 diabetes diagnosis. Additionally, a larger sample size would help to evaluate some of the relationships in this study to see if they are significant in a more representative sample of the population. This research project would be expensive and complex, which would require extensive planning and preparation.

In reference to self-report data, investigators should consider not only incorporating blood testing to follow glycemic control, but also to use family members’ report when available. For example, if a participant felt guilty reporting that they did not exercise for the past week, other reports could have indicated to the researcher that the participant’s answers may not be valid. Pulling in another member of the household could be difficult, especially using long term research, so further monetary incentive may be necessary.

Finally, to address self-selection bias, a better plan for using physician’s offices should be in place. Researchers may want to spend time getting to know the physician when available and consider the nurses as an avenue for recruitment. Grant money to pay for an extra nurse on staff to distribute research materials and answer questions may help with consistent recruitment with less self-selection bias.
CHAPTER 6

Conclusion

The purpose of this study was to examine self-care behaviors in a female rural African American sample, such as healthy eating, physical activity, foot care, and monitoring blood glucose levels, which are important in long-term prognosis of type 2 diabetes. Using a social ecological model and stress coping theory, I hypothesized that community disadvantage would lead to more depressive symptoms and less diabetes self-care, more depressive symptoms would lead to less diabetes self-care behaviors, community disadvantage would be indirectly related to diabetes self-care, and that the relationship between community disadvantage and depressive symptoms would be moderated by social support. Except for social support as a moderator, all hypotheses were confirmed using SEM. MFTs are uniquely situated to address the psychological needs of this population by helping them manage depressive symptoms. The current study has advanced the topic of type 2 diabetes self-care behaviors by addressing a unique population, rural African American women, and by offering suggestions to MFTs who may utilize this information in a collaborative healthcare model. Future investigation should be focused on longitudinal research with the patient and other family members using several modes of assessment to further develop the model so that appropriate interventions may be developed to be more culturally sensitive to rural African American women with type 2 diabetes.
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Appendix A

Summary of Diabetes Self-Care Activities

The next set of questions are about how well you care for yourself as it relates to managing your diabetes.

1. On how many of the last seven days have you followed a healthful eating plan?
   0 1 2 3 4 5 6 7

2. 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

3. 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

4. On how many of the last seven days did you participate in a specific exercise session (such as swimming, walking, or biking) other than what you do around the house or as part of your work?
   0 1 2 3 4 5 6 7

5. On how many of the last seven days did you test your blood sugar?
   0 1 2 3 4 5 6 7

6. 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

7. On how many of the last seven days did you check your feet?
   0 1 2 3 4 5 6 7

8. On how many of the last seven days did you inspect the inside of your shoes?
9. 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 |

10. Have you smoked a cigarette—even one puff—during the past seven days?

No
Yes
Appendix B

Social Provisions Scale

The next set of questions are about how helpful ___[ID Support Person]__ is.

1. You can depend on ______________ to help you if you really need it.
   0 = Strongly disagree
   1 = Disagree
   2 = Agree
   3 = Strongly agree

2. You feel you could not turn to ______________ for guidance in times of stress.
   0 = Strongly disagree
   1 = Disagree
   2 = Agree
   3 = Strongly agree

3. You feel that ______________ does not respect your skills and abilities.
   0 = Strongly disagree
   1 = Disagree
   2 = Agree
   3 = Strongly agree

4. If something went wrong, you feel ______________ would not come to your assistance.
   0 = Strongly disagree
   1 = Disagree
   2 = Agree
   3 = Strongly agree

5. You feel your competence and skills are recognized by ______________
   0 = Strongly disagree
   1 = Disagree
   2 = Agree
   3 = Strongly agree

6. You feel that ______________ does not share your interests and concerns.
   0 = Strongly disagree
   1 = Disagree
   2 = Agree
   3 = Strongly agree
7. You can turn to ______________ for advice if you are having problems.
   0 = Strongly disagree
   1 = Disagree
   2 = Agree
   3 = Strongly agree
Appendix C

Community Deviance Questionnaire

I am going to read a list of things that are problems in some neighborhoods. For each statement please tell how big of a problem it is in your neighborhood.

1. Litter, broken glass, or trash on the sidewalks or streets.
   0 = Not a problem
   1 = Slight problem
   2 = Problem
   3 = A big problem

2. Graffiti on buildings and walls
   0 = Not a problem
   1 = Slight problem
   2 = Problem
   3 = A big problem

3. Vacant or deserted houses or storefronts
   0 = Not a problem
   1 = Slight problem
   2 = Problem
   3 = A big problem

4. Drinking in public
   0 = Not a problem
   1 = Slight problem
   2 = Problem
   3 = A big problem

5. People selling or using drugs
   0 = Not a problem
   1 = Slight problem
   2 = Problem
   3 = A big problem

6. Groups of teenagers or adults hanging out in the neighborhood and causing trouble
   0 = Not a problem
   1 = Slight problem
   2 = Problem
   3 = A big problem
I am going to describe some events that may or may not have happened in this neighborhood. Please tell me how often it has happened in your neighborhood during the past six months.

7. Fight in the neighborhood in which a weapon was used
   0 = Never
   1 = Sometimes
   2 = Often
   3 = Always

How often has this happened in your neighborhood in the past six months?

8. Violent argument between neighbors
   0 = Never
   1 = Sometimes
   2 = Often
   3 = Always

9. Gang fights
   0 = Never
   1 = Sometimes
   2 = Often
   3 = Always

10. A sexual assault or rape
    0 = Never
    1 = Sometimes
    2 = Often
    3 = Always

11. Robbery or mugging
    0 = Never
    1 = Sometimes
    2 = Often
    3 = Always