# ABSTRACT

African American Women with Type 2 Diabetes: A Biopsychosocial-Spiritual Approach

April M. Hames

This dissertation consists of two articles written to address the context of type 2 diabetes care in African American women. In addition, the proposal and required Institutional Review Board (IRB) documentation are included as Appendices. The first article is a review of the existing literature regarding the psychosocial and spiritual aspects of type 2 diabetes management and outcomes in African American women. The aim of conducting this review of extant literature was to identify what further research was needed specifically in African American women with type 2 diabetes as there is very little to date. The second article was written to identify and explore several demographic and biopsychosocial-spiritual variables associated with type 2 diabetes control in African American women. A set of variables were found to predict diabetes control over time (hemoglobin A1c (HbA1c)), body mass index (BMI), and depression severity.

The focus of type 2 diabetes management has been predominantly biomedical. With major disparities in morbidity and mortality and a growing disease burden, the psychosocial-spiritual context of diabetes is important to consider. For this non-systematic review, articles were found in Google Scholar, EBSCO, and reference sections of resultant articles. Search terms included “type 2 diabetes management,” “family,” and “African American” and were set as follows: “type 2 diabetes management and family” and “type 2 diabetes management and African American.” A total of 41 articles met inclusion criteria. Several factors associated with type 2 diabetes management in African American women were identified including: psychosocial support, socioeconomic status, culture, gender and sex, mental health, and spirituality. African American women’s health appeared particularly sensitive to family context and spiritual wellbeing. Culture, socioeconomic status, and mental health were also associated with their diabetes-related health outcomes. Future researchers should address the multiplicative influence of these factors specifically in relation to African American women and their diabetes management and outcomes.

The second article was written to report the biopsychosocial-spiritual variables related to type 2 diabetes management in African American women. A cross-sectional survey of African American women with type 2 diabetes (n=58) was utilized to explore demographic and biopsychosocial-spiritual variables related to diabetes control (HbA1c). Associations between BMI and depression severity (PHQ-9) and demographic and biopsychosocial-spiritual variables were explored. Participants were surveyed with the following scales: Diabetes Care Profile, Patient Health Questionnaire-9 (PHQ-9), Family Crisis Orientation Personal Evaluation, Illness Cognition, Health Distress, and Basic Adlerian Scales for Interpersonal Success. BMI and current HbA1c were extracted from participants' medical records. According to hierarchical regression analyses, the biopsychosocial model trended toward significant prediction of the variance in HbA1c (Adjusted $R^2$=0.10, p=0.06); the demographic and biopsychological model explained 27% (Adjusted $R^2$=0.27, p<0.001) of the variance in BMI; and the demographic and biopsychosocial-spiritual model explained 52% (Adjusted $R^2$=0.52, p<0.001) of the variance in depression. Disability status was a significant individual predictor of BMI (β=0.32, p=0.02). Health distress (β=-0.34, p=0.01) and social/personal factors (β=0.34, p=0.03) were individually significant predictors of PHQ-9. A revised framework of biopsychosocial-spiritual factors may be more predictive of HbA1c and diabetes risk factors in this population. This warrants further investigation in efforts to improve type 2 diabetes management and outcomes.

# African American Women with Type 2 Diabetes: A Biopsychosocial-Spiritual Approach

A Dissertation Presented to
The Faculty of the Department of Child Development and Family Relations
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In Partial Fulfillment of
the Requirements for the Degree
Doctor of Philosophy in Medical Family Therapy

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March 22, 2010

# African American Women with Type 2 Diabetes: A Biopsychosocial-Spiritual Approach

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# DEDICATION

This dissertation is dedicated to my family. My husband, Gregg Talente, is always proud of my accomplishments, patient when I am not, and supportive throughout any journey I pursue. The models for my hard work, persistence, and personal sacrifice are my parents, Bill and Dottie Hames. They taught me to believe in myself, set my goals high, and work until they are accomplished. My brother, Jason Hames, is an inspiration to me. Through his life, he has taught me how to believe in my convictions and has shown me the importance of the fight for social justice.

# ACKNOWLEDGEMENTS

I would like to thank my major professor, mentor, and friend, Mark B. White, PhD. He has always been calm, patient, and willing to give me the time and space I needed to find my passion, explore it, and research it in my own way. He was always supportive and eager to help further my understanding and the field of Medical Family Therapy. Most importantly, Dr. White is a role model who lives the kind of life that is respectable, fulfilled, and appropriately balanced with personal pursuits and career.

It is important to thank my committee for their patience, feedback, kindness, flexibility, and support. With their help, this research and dissertation can provide a stronger and more meaningful contribution to the extant literature. I appreciate their commitment to education and professionalism.

I would like to thank the Department of Family Medicine's Research Division. My colleagues there provided the opportunity for me to receive pilot funding to support data collection and dissemination. They also supported me with their knowledge, passion for research, kindness, and belief in this project. Their advanced statistical knowledge and understanding of disease and context of care has been inspiring. This research was may possible partially by the pilot grant I was awarded from the Department of Family Medicine's Research Division.

My research assistant, Laura Dail, was integral to data collection and data entry. She went above and beyond anything asked of her to enroll and survey as many participants as possible. Laura taught me to remain positive, assume the best, and persist until the work was done.

My family shared me with a doctoral program for several years. My parents taught me the importance of education and perseverance in the face of any and all obstacles. My husband provided unceasing patience and positive support. In addition to my husband and parents, extended family and friends have been my psychosocial and spiritual diabetes context of care. Together, they inspired me to help others with their struggles with diabetes by providing models of support in a battle with my own diabetes.

Finally, I want to thank each participant who shared very personal information about her life and struggles with type 2 diabetes in order to improve the lives of others. All of these women completed a 20 page survey and allowed us to access their personal medical records. It is through sacrifices such as these that diabetes care and management can improve for many.

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# Chapter 1: Preface

# PREFACE

There are very few people that have not been impacted in some way by diabetes. Not only is it a major financial burden in our society, it is a very personal disease that impacts individuals, relationships, families, and communities. Growing up, I encountered a few family members and friends who had various types of diabetes. The first person I ever remember seeing give herself insulin injections was my paternal grandfather's sister, Mary Hames Mullins. When she would visit, my grandfather would comment on her love of and indulgence in sweet foods. Though I never said it aloud, I always wondered how it made her feel to hear that as well as how difficult it must be to have family members and her spouse be so aware of everything she ate. I also considered how hard it would be to know that eating certain foods could make you very sick.

As the years passed, I encountered more and more individuals with diabetes. These individuals were family members, church congregation members, friends, and children. No two of those individuals had the same trajectories of illness or strategies for health and coping. However, most had very similar, tragic outcomes and emotional hardships. With the exception of my grandmother, who is among the minority of individuals that change their lifestyles and reverse their diabetes, they all have poor health and many have lost their limbs and/or their lives.

They were my teachers. During graduate school, I became one of them. Currently, I do my best to care for my type 1 diabetes, but every day is a battle for control, health, and wellbeing. Diabetes never takes a vacation, is rarely predictable, and completely impacts every aspect of people's lives from their mental health to their sexuality. Now, I can guess what Aunt Mary may have been thinking as she went for another piece of cake. If she was anything like me, she was thinking that it was yummy and she deserved to celebrate and be included in our family's togetherness in the same ways as everyone else. Sadly, she probably felt guilt, shame, and fear after the immediate gratification subsided.

Living with diabetes takes a physical, psychological, and spiritual toll on wellness. It follows me to work, vacation, family gatherings, sleep, and church. There is never a time that it is not a conscious part of my life. Through my years living with diabetes and my studies in Medical Family Therapy, I realized that I am not alone in these feelings of quiet despair. So, in true congruence to my personality, I embarked upon a dissertation topic that would help others through their personal struggles with diabetes.

I chose to research type 2 diabetes in African American women. Since it is the most prevalent form, type 2 diabetes seemed to be the logical choice. I also chose type 2 because I wanted to make sure to not get too personally involved and insert my opinions and feelings where they did not belong. The reason I chose to focus on African American women is born out of compassion, curiosity, and need. When I was diagnosed, I was naive to think that all who had diabetes had the same opportunities for quality care and good outcomes. However, as I began my course of study in Medical Family Therapy, I learned that even with similar quality of care, diabetes-related outcomes and quality of life vary extensively. African American women have some of the worst outcomes associated with diabetes management. My curiosity and compassion united in a way that set the stage for me to research how the experience of being an African American woman may influence type 2 diabetes control and outcomes. There continues to be a growing need for research in the area of health disparities and I am fortunate to have had the opportunity to contribute.

This dissertation has two parts, each of which focuses on the experience of African American women with type 2 diabetes. The first article is a review of the extant literature on the impact of individual psychosocial and spiritual factors on type 2 diabetes management in African American women. The second article is an attempt to examine the combined effect of several demographic and biopsychosocial-spiritual factors on type 2 diabetes management in African American women. To date, no predictor model of type 2 diabetes control has been established for African American women.

This research was supported, in part, by the Research Division of the Department of Family Medicine at the Brody School of Medicine at East Carolina University.

# Chapter 1: Literature Review

# Abstract

This article was written to identify and review the relevant literature regarding the psychosocial-spiritual context of type 2 diabetes management in African American women and to highlight areas for future research. Historically, the focus of type 2 diabetes management has been predominantly biomedical. However, with major disparities in morbidity and mortality, as well as a growing disease burden, the psychosocial-spiritual context of diabetes care in African American women is important to consider. For this non-systematic review, articles were found in the EBSCO database and reference sections of resultant articles. Search terms included "type 2 diabetes management," "family," and "African American" and were set as follows: "type 2 diabetes management and family" and "type 2 diabetes management and African American." There were 41 articles meeting inclusion criteria. Critical review of the literature utilizing a biopsychosocial-spiritual framework identified several factors associated with type 2 diabetes management in African American women including: psychosocial support, socioeconomic status, culture, gender and sex, mental health, and spirituality. African American women's health appears particularly sensitive to family context and spiritual wellbeing. Culture, socioeconomic status, and mental health are also associated with health outcomes in these women. Future researchers should address these factors specifically in relation to African American women and their diabetes management and outcomes. Interventions should be designed to incorporate the biopsychosocial-spiritual context of care in African American women with type 2 diabetes.

# Introduction

Diabetes is a major clinical and public health problem in the United States. It is a common, chronic, incurable, systemic disease characterized by glucose intolerance or the body's inability to properly utilize glucose (Elders & Murphy, 2001). Type 2, usually diagnosed in middle or old age, is the most common form of diabetes (Black, 2002). It accounts for about 90% of all diagnoses (DeCoster & Cummings, 2005). Although diabetes is typically chronic and incurable, the disease can be controlled through the use of medication, diet, exercise, and other self-care strategies. Most frequently considered a disease of middle and older age, type 2 diabetes typically is diagnosed after age 40.

## *Health Disparities in Type 2 Diabetes*

Women and racial/ethnic minorities experience higher rates of diabetes (Chou et al., 2007). In ethnic minority groups, the impact of type 2 diabetes, in terms of prevalence, quality of life, death, and disability, is greatly magnified (Elders & Murphy, 2001). After adjusting for population age differences, non-Hispanic African Americans are 1.8 times more likely to have diabetes than Caucasians (American Diabetes Association [ADA], 2006). Researchers project that diabetes diagnoses in African Americans will increase 50% by the year 2020 as compared to a 27% increase for Caucasians. African American women have a 10% higher incidence of diabetes than African American men (Carter-Edwards, Skelly, Cagle, & Appel, 2004). Consistently higher rates of diabetes-related complications including: end-stage renal disease (ESRD), neuropathy, retinopathy, blindness and non-traumatic lower-extremity amputations have been evidenced in African Americans, especially women (Konen, Summerson, Bell, & Curtis, 1999). Because of these high rates of prevalence, morbidity, and mortality, type 2 diabetes in African Americans is a major health problem that must be addressed (Polzer & Miles, 2007).

Evidence is mixed concerning whether there are racial differences in processes of diabetes care across ethnicities (Heisler, Smith, Hayward, Krein, & Kerr, 2003). African Americans with diabetes have worse glycemic, lipid, and blood pressure control than other groups (e.g., Harris, Eastman, Cowie, Flegal, & Eberhardt, 1999; O'Meara et al., 2004). Although African Americans have poorer symptom control, few researchers have demonstrated that they, specifically women in this ethnic group, receive less aggressive biomedical treatment for their diabetes (Chin, Zhang, & Merrell, 1998; Harris et al., 1999; Heisler et al., 2003). Differences in medication adherence and other self-management practices have been identified (Trinacty et al., 2007). However, researchers have suggested that targeting medication adherence alone is unlikely to reduce diabetes control in any population (Adams et al., 2008).

There are well-documented differences in health and type 2 diabetes outcomes in women and men (Annandale & Hunt, 2000; Read & Gorman, 2006). In females, diabetes typically has a more devastating impact and is more difficult to control (Black, 2002). African American women are at a significantly elevated risk for diabetes and its complications (Black, 2002; Hargreaves, Schlundt, & Buckowksi, 2002). Some identified risk factors particular to African American women include low SES, obesity, less physical activity, depression, multiple caregiver role, and increased risk of gestational diabetes. Even after adjustment for SES, age, and marital status, women fare worse than men in their same racial/ethnic group in standard measures of health; and, African American women fair the worst with the highest rates of life-threatening conditions associated with diabetes among Caucasian women and men, Mexican women and men, Puerto Rican women and men, Cuban men and women, and non-Hispanic African American men (Read & Gorman, 2006).

### *Biopsychosocial-Spiritual Framework*

The individual management aspects of type 2 diabetes (i.e., glycemic control, BMI, and/or medication adherence) do not solely explain the disparities between ethnic groups in prevalence, morbidity, and mortality of this disease (ADA, 1999). According to Nichols, Hillier, Javor, and Brown (2000), characteristics of disease, home environment, and treatment of diabetes explained 94% of the variance of blood glucose control among individuals with type 1 diabetes in a study in France. Though African Americans with diabetes have more severe disease progression at the initiation of treatment, one cannot underestimate the unmeasured biological, cultural, or environmental determinants of health that may explicate the disparities in the management, progression, and outcomes of type 2 diabetes in this population (Adams et al., 2008).

Since the biological factors do not solely explain the diabetes-related disparities in disease morbidity and mortality in African American women, the psychosocial-spiritual context of care is important to consider. Researchers have begun to address individual aspects of that milieu from cultural responsibilities, such as multigenerational and extended family caregiving (Ahye, Devine, & Odoms-Young, 2006; James, 2004), to mental health (Rubin & Peyrot, 1999) and from psychosocial support (Fisher, 2005) to spirituality (Polzer & Miles, 2007). To date, a predictive biopsychosocial-spiritual model of type 2 diabetes care and outcomes has not been explored. The purpose of this review was to explore the biopsychosocial-spiritual aspects of type 2 diabetes management and outcomes in African American women and to highlight areas for future research. A focus on the relational and cultural contexts of type 2 diabetes management in African American women may influence treatment and prevention.

## Method

This is a non-systematic review of literature. The articles in this review were found in Google Scholar and EBSCO specifically in: HostAlt HealthWatch, CINAHL Plus, MEDLINE, Nursing and Allied Health Collection: Comprehensive, PsycINFO, Medline, PubMed, and OVID. Search terms included “type 2 diabetes management,” “family,” and “African American” and were set as follows: “type 2 diabetes management and family” and “type 2 diabetes management and African American.” There were 41 articles meeting inclusion criteria and all are reviewed below. Initially, the search terms “women” or “female” were included, but the results were too narrow with either of those terms. Limiters were English language and human populations. There were no limiters related to publication dates or study location as so few studies were found under the final search terms. Qualitative and quantitative research studies were reviewed. Search results were included if they considered psychosocial or spiritual considerations of management and outcomes of diabetes. Reference lists from those articles were also sought, reviewed, and the articles were included if they met inclusion criteria. The categorical labels for ethnicity utilized by the author(s) of each article were included as written. This included capitalization (i.e., “white” versus “White”) and hyphenation (i.e., “African-American” versus “African American”). See Table 1 for a synopsis of the reviewed literature.

The articles reviewed were grouped according to themes. These themes were psychosocial support (13 articles), SES (6 articles), culture (11 articles), gender and sex (5 articles), mental health (7 articles), and spirituality (5 articles). Those numbers do not total 41 because some articles overlapped thematic categories and were reviewed in more than one theme relative to the researchers' contributions to that category.

*Table 1*. Reviewed Publications

| Author(s)/Date | N | Population | Women (%) | Type 2 Diabetes | Method | Results/Conclusions |
|---|---|---|---|---|---|---|
| Ahye et al. (2006) | 30 | African American | 100 | At-risk or diagnosed | Grounded theory | Responsibility, feeling of duty to provide meals for family, social connection of family members through food, caretaking, and entitlement were themes for managing food/nutrition; chronic diseases as inevitable products of old age |
| Anderson-Loftin & Moneyham (2000) | 22 | African American | 68.2 | X | Focus group | Vicarious experiences with family/friends as primary motivation for diabetes self-care; barriers to good healthcare delivery included lack of empathy and culturally-sensitive services |
| Baptiste-Roberts et al. (2007) | 1122 | African American | 68 | X | Cross-sectional survey | Women were more likely to report family history of diabetes; those with family history were more likely to rate health as fair-poor, be overweight, and be aware of diabetes risk factors |
| Becker et al. (2004) | 167 | African American | 53.9 | Diabetes, asthma, heart disease | Focus group | Preferred group over individual social support; social support, advice, spirituality, and nonbiomedical healing as primary influences on self-care |
| Borrell et al. (2006) | 187,233 | African American, Caucasian, Hispanic | Not reported | Prevalence study | Retrospective analysis | Educational attainment was associated with decreased diabetes prevalence among Caucasians, Hispanics, and women, but not among African Americans |

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| Burns & Skelly (2005) | 9 | African American | 100 | X | Qualitative interviews | Overall daily living with diabetes was a major challenge; themes were symptoms of and reactions to initial diagnosis, diabetes education, self-management of food intake, concerns and anxieties, things that enhanced/hindered self-management |
| Cagle et al. (2002) | 12 | African American | 100 | X | Focus group | Themes were family as core; work as survival; pressures of balancing work, family, and diabetes; impaired role function; and inner-strength |
| Carter-Edwards et al. (2004) | 12 | African American | 100 | X | Focus group | Support comes from family, friends, and healthcare providers; lack of familial understanding was common as was concern over dual challenges of diabetes management and multicaregiving |
| Chesla et al. (2004) | 159 | African American | 60 | X | Cross-sectional survey | Unresolved family conflict was associated with diabetes management, morale, more depressive symptoms, lower diabetes-related quality of life |
| Collins-McNeil et al. (2007) | 45 | African American | 100 | X | Cross-sectional survey | Significant associations between depressive symptoms and mean CVD risk scores |
| Cudney et al. (2005) | 120 | Not reported | 100 | Cancer, diabetes (16%), rheumatoid conditions, multiple sclerosis | Computer intervention | Trouble relating to others (family/friends), feelings of isolation, fears of rejection surrounding illness difficulties, and misunderstandings among family members concerning disease toll were the most difficult aspects of illness |
| de Groot et al. (2003) | 181 | African American | 100 | At-risk | Longitudinal survey | Nonworking status, lack of home ownership, low appraisal of economic situation, low self-esteem, and increased life events were significantly associated with depression |

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| Drayton-Brooks & White (2004) | 26 | African American | 100 | Diabetes, heart disease | Focus group | Prayer, relationships with others, pastoral support, feeling included/accepted, and trusting health providers increased healthy lifestyle behaviors; being/living alone, social pressures to eat unhealthy, stressful lifestyles were barriers |
| Fisher (2005) | 509 | African American (31%), Chinese American, European American, Hispanic | 100 | X | Longitudinal survey | Across ethnicities, inability to resolve diabetes-related problems within family, pessimistic belief in world as meaningful/manageable, tendency not to do things with family members, and general dissatisfaction with spouse/partner relations were dimensions associated with diabetes management; family risk indicators associated with management included high depressive affect, dissatisfaction with diabetes and management, and poor glycemic control |
| Hargreaves et al. (2002) | 40 | African American | 100 | At-risk | Focus group | Meaning of food influenced by personal, cultural, and environmental contexts that place African American women at high risk for poor eating choices; when/where food is eaten is more important than what is consumed; convenience and time are most indicative of food choices |
| James (2004) | 40 | African American | 47.5 | At-risk | Focus group | Eating healthy means giving up cultural heritage and conforming to dominant culture; male partners and children as barriers to healthy eating; lack of support by friends and relatives regarding dietary changes |
| Kimmel et al. (2000) | 295 | African American (92%), Caucasian | 28 | X | Longitudinal survey | ESRD decreased survival rates in females but not males reporting negativity in marital relationships |

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| Koch (2002) | 31 | African American | 100 | X | Cross-sectional survey | Statistically significant differences between those who exercise and those who do not in perceived benefits and barriers to exercise and glycemic control in diabetes management |
| Liburd (2003) | n/a | African American | 100 | X | Anthropological perspective model | Modification of dietary patterns may be particularly challenging given the highly ritualized nature of food selection and eating and meanings encoded in the African American experience |
| Melkus et al. (2009) | 103 | Caucasian, African American (48.5%) | 100 | X | Cross-sectional secondary analysis | African American women were younger at diagnosis, had lower incomes, worked more hours, had significantly higher levels of diabetes-related emotional distress, less support, and worse glycemic control than Caucasian women |
| Misra & Lager (2009) | 180 | Non-Hispanic White, African American (18%), Asian-Indian, Hispanic | 52 | X | Cross-sectional survey | Regarding diabetes, women were more anxious, perceived more restrictions in social interactions, received higher social support; African Americans relied more on informal social networks, and perceived social support was significantly associated with improved management and acceptance of illness |
| Montague et al. (2005) | 75 | African American | 100 | X | Cross-sectional survey | Significant correlations among locus of control, self-reported health, and HbA1c |
| Moody-Ayers et al. (2005) | 42 | African American | 71 | X | Cross-sectional survey | 95.2% reported exposure to racism; higher lifetime exposure to racism was reported by men and those with higher household income; greater passive coping was associated with being female and having lower household income |

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| Murry et al. (2003) | n/a | African American | 100 | X | Heuristic model | Exposure to multiple stressors may lead to exaggerated coping behaviors to prove competence, which may prevent seeking and accepting help; combined effects of social, familial, and individual stressors create endemic stress |
| Penckofer et al. (2007) | 41 | African American (42%), Caucasian | 100 | X | Focus group | More similarities than differences by race; themes included struggling with changing health, encountering relationship challenges, anxiety about health, multiple responsibilities, and needing a break; strong emotions were related to having and managing diabetes as well as being a caregiver |
| Polzer & Miles (2007) | 29 | African American | 65.5 | X | Grounded theory | Typologies of spirituality: relationship and responsibility (God in background), relationship and responsibility (God in forefront), and relationship and non-responsibility (God as healer); different views impacted diabetes self-management |
| Polzer (2007) | 29 | African American | 65.5 | X | Focus group | Care perceived as spiritual can be an important part of providing culturally-sensitive healthcare to African Americans with type 2 diabetes |
| Rayman & Ellison (2004) | 11 | Not reported | 100 | X | Multidisciplinary diabetes education intervention | Social context of diabetes was important part of learning intensive self-management; those who struggled with self-management blamed themselves; felt being "emotional" about self-management was not an illness-management issue yet this led to periods of "opting out" of management |

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| Scollan-Koliopoulos et al. (2006) | 123 | African American (24.2%), Caucasian, Asian, Hispanic | 51.6 | At-risk or diagnosed | Survey development (assessment of psychometrics) | Participants learned how to care for diabetes through family members; perceived social consequences of diabetes explained 22% variance of how participants made sense of their illness |
| Signorello et al. (2007) | 43,822 | African American (78.3%), Caucasian | 60.3 | Prevalence study | Retrospective analysis | Diabetes prevalence was moderated by age, increasing BMI, decreasing education, and decreasing income in participants other than African American women |
| Skelly et al. (2005) | 41 | African American | 100 | X | Randomized intervention | Intervention participants showed statistically significant improvements in self-care behaviors, quality of life, and symptom distress; all participants experienced improved HbA1c levels |
| Skelly et al. (2009) | 180 | African American | 100 | X | Longitudinal intervention | All participants experienced significant reductions in HbA1c with no differences between study arms; symptom distress, perceived quality of life, diabetes impact, and self-care improved significantly for both groups |
| Tang et al. (2008) | 89 | African American | 67 | X | Cross-sectional survey | Satisfaction with social support was predictor of diabetes-specific quality of life, blood glucose monitoring; negative support was associated with medication noncompliance |
| Tanyi & Werner (2007) | 58 | African American (53.4%), Caucasian | 100 | X | Cross-sectional survey | African Americans with ESRD reported higher religious well-being, were more satisfied with their lives, and expressed stronger sense of future direction/purpose |
| Thomas et al. (2007) | 326 | African American (74%), Caucasian | 80 | 31.9% | Cross-sectional survey | Social support was correlated with depressive or anxiety disorders across illnesses; odds of having a depressive or anxiety disorder increased by an odds |

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| | | | | | | ratio of 2.26 compared to those with other chronic illnesses but not diabetes |
| Trozzolino et al. (2003) | 48 | Caucasian, African American (25%), Hispanic | 65 | X | Family psychoeducation group intervention | Statistically significant gains in glycemic control and depression severity when part of group intervention |
| Turner-Musa & Leidner (1999) | 476 | African American | 54 | X | Cross-sectional survey | After controlling for age, females with ESRD were at two-times greater risk of shortened survival if they lived alone or with a spouse/partner only |
| Utz et al. (2006) | 73 | African American | 57 | X | Focus group | Reported significant lack of continuity of care; diagnosis occurred at late stage of disease; highly value emotional support from parents, children, relatives, and friends |
| Wagner & Abbott (2007) | 120 | African American | 74.2 | X | Cross-sectional survey | Higher HbA1c, perceived discrimination, and female sex were independent predictors of depression |
| Wagner et al. (2007) | 740 | Caucasian, African American (26.7%), Hispanic | 61.6 | X | Cross-sectional survey | After adjusting for age, sex, and number of diabetes complications, there were no significant differences by race for depressive symptoms; African Americans were less likely to be diagnosed with depression and to report pharmacotherapy |

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| Wagner et al. (2009) | 289 | African American (55%), Caucasians | 55.6 | X | Cross-sectional survey | After adjusting for insulin use, SES, and number of depressive symptoms, African Americans were 5.6 times less likely to have discussed depressive symptoms with anyone; significantly less likely to have talked about depressive symptoms with health providers, seen a psychiatrist, or been prescribed an antidepressant |
| Whittemore et al. (2005) | 53 | Not reported | 100 | X | Pilot nurse coaching intervention | Support and confidence in living with diabetes most consistent predictor of metabolic control, dietary self-management, and diabetes-related distress |

## Results

### *Psychosocial Support*

Psychosocial support has been defined as an ongoing process of meeting emotional, social, mental, and spiritual needs, all of which are considered essential elements of meaningful living (Bertera, 2003). Receiving psychosocial support is an important factor directly and indirectly related to the management of type 2 diabetes. Researchers have suggested a link between psychosocial factors and adherence behaviors as well as several endocrine and autonomic pathways (e.g., de Wit et al., 2007; Hocking & Lochman, 2005; Karlsen, Idsoe, Hanestad, Murberg, & Bru, 2004; Lewin et al., 2006). Within the search parameters for this review, there were several research teams who investigated the relationship of gender/ethnicity and psychosocial support in those with type 2 diabetes.

Ethnic and gender differences in diabetes outcomes, psychosocial predictors, knowledge, and perceived difficulty in self-management among a convenience sample of 180 (52% female) participants with type 2 diabetes were examined in a cross-sectional study (Misra & Lager, 2009). Participants were non-Hispanic white (27%), African American (18%), Asian-Indian (20%), and Hispanic (34%). Significant racial/ethnic differences and gender differences in perceived difficulty in self-management behaviors, acceptance of diabetes, disease knowledge, and quality of life were found. Women were more anxious about their diabetes and perceived that it restricted their social interactions more than men. They also reported higher social support with diabetes. African Americans in this study relied more heavily on informal social networks to meet their diabetes management needs. Improved diabetes acceptance and management were associated with perceived social support in African American participants. This increased acceptance improved adherence behaviors excluding diet and physical activity.

Similar findings were reported in a study examining social support and the association of type 2 diabetes and mental health issues in low-income adults (n=362); 74% of participants were African American and 80% were female (Thomas, Jones, Scarinci, & Brantley, 2007). Logistic regression results suggested that with each standard deviation decrease in social support, the odds of having a depressive or anxiety disorder increased. There were three groups of individuals including those with: no chronic physical illness (n=58); a diagnosis of type 2 diabetes (n=164); and a diagnosis of hypertension, asthma or arthritis but not type 2 diabetes. Those with diabetes had more than double the odds of having a depressive and/or anxiety disorder compared with those with other chronic illnesses besides diabetes. Regardless of diagnoses or conditions, a significant main effect was observed ($\chi^2$ [5, n=326]=5.47, p< 0.000) when social support was added to the statistical model. In this and the previous study, social support appears to serve a protective function with respect to health. However, neither study provided insight into the specific meaning of social support and what defined positive social support.

Social support and its relation to diabetes-specific self care behaviors and quality of life in African Americans (n=89, 67% females) was explored in a cross-sectional observational study by Tang, Brown, Funnell, and Anderson (2008). Satisfaction with social support was a predictor of diabetes-specific quality of life ($r=-0.579$, $p<0.05$) and blood glucose monitoring ($r=0.258$, $p<0.05$). Healthy eating ($r=0.280$, $p<0.05$), carbohydrate planning ($r=0.367$, $p<0.01$), and 30 minutes of daily physical activity ($r=0.296$, $p<0.05$) were predicted by positive support behaviors; and negative support behavior was predictive of pharmacologic noncompliance ($r=-0.348$, $p<0.01$). Social support played a role in self-management and diabetes-specific quality of life in these participants. What was not explored in this study was the impact of gender on these predictor variables as well as whether those variables were predictive of metabolic outcomes (i.e., HbA1c).

Interventions to increase women's perceived self-confidence and support may contribute to improved mental health and improved type 2 diabetes health outcomes (Whittemore, Melkus, & Grey, 2005). In a pilot study of a nurse coaching intervention, a randomized sample of women with type 2 diabetes (n=53) reported that the most consistent predictor of metabolic control (HbA1c), dietary self-management, and diabetes-related distress was social support and the resultant confidence in living with diabetes. Participants reported low diabetes-related distress as well as high support and integration of diabetes into daily life. Higher social support and confidence levels were associated with lower HbA1c levels. Higher social support was an individually significant predictor ($\beta=0.38$, $p=0.01$) of diabetes-related distress. The authors noted that the women in this study were "fairly homogenous" (p. 201). This is a limitation as it is unclear whether African American participants were included.

*Family.* Family is the social context with the most immediate impact on disease management (Fisher, 2005). It is a "unique setting with powerful continuing relationships that assume levels of complexity and organization that go beyond the individuals involved" (Weihs, Fisher, & Baird, 2002, p. 9). The individual diagnosed with diabetes has the chronic disease, but structures, beliefs, and practices in families have major affects on disease outcomes. For example, conflicted family relationships can interfere with regulation of emotion (Levenson & Gottman, 1983) and impact behaviors related to chronic disease management (Weihs et al., 2002). In a study of men and women with diabetes including African American (25%) men and women (65%), participants demonstrated statistically significant gains in glycemic control and improvement in depression when they were part of a family psychoeducational group on mood and glycemic control (Trozzolino, Thompson, Tansman, & Azen, 2003).

In his study, Fisher (2005) evaluated associations between disease management behaviors and family characteristics among African American, Chinese American, European American, and Hispanic individuals with type 2 diabetes (n=509; 31% African American) from community healthcare settings with no evidence of major diabetes complications. Though there was no variation in the association between family and disease management scales across ethnic groups, how family and health dynamics were expressed and experienced varied significantly. Dimensions independently and most often associated with diabetes management across each ethnic group included: inability to resolve diabetes-related problems within the family, pessimistic belief in the world as meaningful and manageable, tendency not do things often with family members, and general dissatisfaction with spouse/partner relations. Family risk indicators significantly associated with these diabetes management dimensions included: patient reports of high depressive affect, dissatisfaction with diabetes and its management, and poor glycemic control. This study could have been strengthened by incorporating a qualitative element exploring the specifics of diabetes-related problems in the family and how participants would have liked to see them resolved.

The fact that family context merits further studies on long-term diabetes management has been attributed to linkages found between change in disease management and family characteristics over time. Chesla et al. (2004) assessed 159 African American men and women (60%) with type 2 diabetes to specify family life characteristics associated with disease management. They found that family variables of togetherness, coherence, and unresolved conflict were significantly associated with disease management variables. However, no family variables were significantly related to diabetes management outcomes (HbA1c). Family measures were most strongly associated with patient morale. Lower diabetes-related quality of life and higher depressive symptoms were significantly associated with unresolved family conflict around diabetes. Family coherence was positively associated with physical activity levels and diabetes-related quality of life. Additional diabetes-related biomarkers (i.e., BMI and blood pressure) could have been explored to determine whether these family variables were associated with them.

Several focus group studies of African American women with type 2 diabetes explored various familial support factors related to diabetes management. In one study (n=12), perceptions of work and the multicaregiver role were explored to delineate their influence on diabetes self-management and coping (Cagle, Appel, Skelly, & Carter-Edwards, 2002). The women identified four themes: family as core (participants as matriarchs and leaders of households), work as survival, impaired role function (ability to manage diabetes despite responsibilities at work and home), and inner-strengthening (self-preservation via spirituality and introspection). Family was consistently prioritized over work and diabetes management. Participants reported an average of six daily roles (mother, partner, employee, chauffeur, cook, and community/church member) that detracted from diabetes-management opportunities. A consistent concern was related to development of diabetes complications that would affect the ability to continue to support and care for family. For participants, church was a place to feel success, safety, understanding, and reprieve from multicaregiving roles.

A similar group of researchers utilizing focus groups comprised of a convenience sample of African American women (n=12) evaluated the relationship between perceived social support and diabetes self-management (Carter-Edwards et al., 2004). Participants reported that support primarily came from family members but also from friends and healthcare providers. As in the previous study, participants also reported being multicaregivers. However, they felt these support roles provided them with the independence and control necessary to support their image as strong women despite their diabetes. The resultant life stresses made it more difficult emotionally and physically to maintain effective diabetes self-management. Another important emergent theme was that participants felt their families did not comprehend their life with diabetes in a way that allowed them to provide appropriate assistance. Denial and misunderstanding led some family members to provide poor health advice. Both of these qualitative studies could have been strengthened by incorporating perspectives of family members and others who were considered as those providing psychosocial support.

End stage renal disease (ESRD) is a common type 2 diabetes complication disproportionately represented in African Americans. In a study by Kimmel et al. (2000) with 92% of participants reporting race as African American, female participants with ESRD in negative marital relationships receiving hemodialysis had decreased survival rates relative to those in positive marital relationships. The same relationship was not true for males. Turner-Musa and Leidner (1999) found that in African Americans with ESRD, females appeared more vulnerable than males to negative influences of family relationships. In their study (n=476), African American women who lived alone or with only a spouse were twice as likely to have shortened survival rates in ESRD than those who lived with more household members such as extended kin and adult children. Family structure was not significantly associated with mortality in male patients. In both of these studies, African American females seemed more vulnerable to family stressors than their male counterparts; it would have been interesting to explore whether the same gender differences existed in other ethnicities.

Those with diabetes learn to make sense of diabetes and learn health behaviors in the context of family. In a cross-sectional study by Baptiste-Roberts et al. (2007), the specific role family history plays among African Americans adults (n=1122, 68% female) at risk for diabetes in terms of their awareness of diabetes risk factors and engagement in protective health behaviors was examined. Women were more likely than men to report a family history of diabetes and those with a family history of diabetes were more likely to rate their health as fair or poor, be overweight, and be aware of diabetes risk factors. Having a family history of diabetes was associated with better awareness of diabetes risk factors, healthier eating, and participation in diabetes screening. In a similar study of individuals with type 2 diabetes (n=123), researchers found that individuals (24% African American; 51% female) made sense of their chronic illness in the context of their life and its history (Scollan-Koliopoulos, O'Connell, & Walker, 2006). Through a principal component factor analysis, researchers found that in the context of multigenerational legacies of diabetes individuals learn how to care for their diabetes through family members with diabetes. Perceived social consequences of diabetes explained 22% of the variance in this model of how individuals with a family history of diabetes made sense of their illness and its course.

In the articles reviewed above, the relationship between diabetes management and psychosocial support is supported. Perceived support has been shown to impact psychological wellbeing (Thomas et al., 2007; Whittemore et al., 2005), diabetes-related coping, and diabetes control (Fisher, 2005; Whittemore et al., 2005). Support and confidence in living with diabetes are predictors of self-management, metabolic control, and diabetes-related distress (Misra & Lager, 2009; Tang et al., 2008). Management and outcomes of diabetes have been associated with physical and emotional proximity to family members (Scollan-Koliopoulos et al., 2006; Turner-Musa & Leidner, 1999), marital satisfaction (Fisher, 2005), and number of individuals cohabitating (Turner-Musa & Leidner, 1999). Within families, unresolved diabetes-related conflict impacts diabetes management, morale, mental health, and diabetes-related quality of life (Baptiste-Roberts et al., 2007; Carter-Edwards et al., 2004; Chesla et al., 2004; Fisher, 2005) for those living with diabetes. In African American women, the multicaregiver role, social support (Cagle et al., 2002; Carter-Edwards et al., 2004), and marital satisfaction (Kimmel et al. 2000; Turner-Musa & Leidner, 1999) have been implicated as predictors of diabetes self-management. However, no known researchers have explained metabolic control in African American women with type 2 diabetes in relation to psychosocial support.

### *Socioeconomic Status*

The socioeconomically disadvantaged are at a higher risk for diabetes and its complications (Black, 2002). Lower socioeconomic status (SES) is associated with risk of developing diabetes and lower prognosis for compliance with treatment and achieving control of blood glucose (Bertera, 2003). African Americans are more likely to be of lower SES, and

African American women share a disproportionate burden of poverty (de Groot, Auslander, Williams, Sherraden, & Haire-Joshu, 2003). In fact, they are three times more likely to live in poverty than Caucasian women. About 50% of all African American families are headed by single females; and 45% of those live in poverty. African American women living below the poverty line have been found to be at greater risk for type 2 diabetes than women with greater economic resources.

Inequalities in health in African American women have been attributed to various mechanisms related to SES that may act as intermediate risk factors for diseases such as type 2 diabetes (Black, 2002). These factors include poor nutrition, increased rates of poor health behaviors (i.e., smoking, limited access to adequate healthcare, alcohol consumption), higher body mass index (BMI), low birth weights among offspring (LBWs), and higher rates of discrimination (Hussain, Claussen, Ramachandran, & Williams, 2006; Lynch, Kaplan, & Sherma, 1997; Robbins, Vaccarino, Zhang, & Kasl, 2001). Discrimination may impact health by contributing to elevated stress levels, suboptimal relationships with medical providers, differences in availability of health-promoting resources, and/or public policies favoring certain groups (Wagner & Abbot, 2007). In general, low SES African American women have lifetime morbidity greater than their low SES Caucasian counterparts. Researchers have found that compounded stressors of race-based and SES-based discrimination work together to create an even greater morbidity burden (Angel & Angel, 2006; Becker, Gates, & Newsom, 2004; Black, 2002; Colen, Geranimus, Bound, & James, 2006; Signorello et al., 2007).

Limited access to appropriate healthcare is another factor related to lower SES. Ethnic minorities under age 65 in the US are at least twice as likely to be uninsured as their Caucasian counterparts (Johnson & Smith, 2002). Individuals with some form of health insurance more frequently report the influence of physicians and health educational programs in self-care regimens for type 2 diabetes than those who are uninsured (Becker et al., 2004). The insured report more extensive, biomedically-informed programs of self-care such as diet and exercise regimens and believe that physicians help tailor specific approaches to their diabetes management. In focus groups of uninsured rural African American men and women with type 2 diabetes (n=73, 57% female), participants reported a significant lack of continuity of care, and most indicated that diagnosis occurred at a late stage in their disease (Utz et al., 2006). The information from these focus groups parallels a report of the Institute of Medicine (IOM), concluding that racial and ethnic minorities in the US receive a lower quality of care than Caucasians (IOM, 2002). The IOM (2002) suggested that these disparities in quality of health care exist even after accounting for differential access to care.

Poverty is associated with negative health outcomes, including depression (de Groot et al., 2003). de Groot and colleagues examined the relationships of social and economic resources to depression in a sample of 181 African American women at high risk for type 2 diabetes. They used an existing theory, Conservation of Resources, as a framework to determine whether individuals with fewer resources were more vulnerable to loss than those with greater resources. Using multivariate logistic regression analyses, researchers found that nonworking status, lack of home ownership, low appraisal of one’s economic situation, low self-esteem, and increased life events were significantly associated with depression. Multifaceted sources of stress in the lives of poor African American women were found. Ethnicity moderated the relationship between depressive symptoms and the health-related quality of life aspects of physical and role-emotional functioning, bodily pain, vitality, and general health perceptions in those with type 2 diabetes. This study could have been strengthened by a longitudinal component in which follow-up with participants may have indicated how many developed type 2 diabetes and whether there were trends related to SES, health behaviors, mental health, and/or self-care.

In a study by Signorello et al. (2007), diabetes prevalence between African American (n=34,331) and Caucasian (n=9491) men and women of similar SES was compared. The researchers' did not find major differences in diabetes rates among the two populations. Diabetes prevalence grew with age, increasing BMI, decreasing education, and decreasing income. There was a trend of type 2 diabetes prevalence rising as income decreased. This trend did not hold true for African American women. As with the previous study, measuring health behaviors, self care, mental health, marital satisfaction, and family roles of participants could have strengthened this investigation.

The issues, concerns, and needs of 22 low-income, southern African Americans with type 2 diabetes attending a small rural health clinic were explored in focus groups of predominantly African American females (n=15) (Anderson-Loftin & Moneyham, 2000). Participants identified learning to live with diabetes and becoming able managers of diabetes-related symptoms as processes necessary to control symptoms and preserve some predictability in their lives. Vicarious experiences with others (i.e., family and friends) that have/had diabetes were a main source of motivation to adhere to prescribed therapies such as diet and medication. Role models were a powerful, yet rare, source of learning. This theme was similar to one found in a previously mentioned study (Baptiste-Roberts et al., 2007). Participants, in the study by Anderson-Loftin and Moneyham (2000), who reported some success with symptom management often were further motivated to make healthier choices due to increased confidence and predictability in their previously unpredictable daily lives as well as decreased anxiety. Many participants perceived a lack of empathy and culturally-sensitive social services related to their chronic poverty as barriers to good personal and professional healthcare delivery. A model incorporating level of culturally-sensitive healthcare, anxiety, and SES as predictors of HbA1c could have intensified the findings of this study.

*Educational attainment.* There is an established relationship between SES and educational attainment (Winkleby, Jatulis, Frank, & Fortmann, 1992). Educational attainment and adult health have been correlated even after controlling for individual and family background characteristics (Adams, 2002). Though about 20% of the general population have less than a high school education, 40% of those with diabetes did not finish high school (Black, 2002). Borrell, Dallo, and White (2006) conducted statistical analyses on data from African American, Caucasian, and Hispanic samples in the 1997-2002 National Health Interview Survey (n=187,233) to examine the association between education and diabetes prevalence in US adults and whether this relationship differed by ethnicity. African American and Hispanic persons were oversampled to ensure reliable estimates for those groups however specific demographics were not provided. Educational attainment was inversely associated with diabetes prevalence among those who were Caucasian or Hispanics but not among those who were African American. Overall prevalence of diabetes was associated with education, with the least educated exhibiting the highest prevalence (10.2%) and those with at least a bachelor's degree the lowest (3.4%). This pattern was consistently observed for age, race/ethnicity, sex, marital status, country of birth, insurance status, and region of residence. People aged 65-74, African Americans, those reporting being married or living with someone, and those having public health insurance coverage exhibited the highest prevalence of diabetes regardless of their education. Women with at least a high-school diploma or GED had a higher prevalence of diabetes than men with the same educational attainment.

SES is a moderator of many outcomes and diabetes prevalence and management is no exception. Though educational attainment is an established moderator of diabetes prevalence, the evidence supporting this moderating relationship in African American women is mixed (Borrell et al., 2006). Signorello et al. (2007) suggested this may be due to a social gradient related to a combination of chronic stress, fetal malnutrition, depression, obesity, inactivity, and lack of access to preventive healthcare. Institutional racism and discrimination perpetuate poverty and its resultant individual-level health through unsafe and unhealthy environments, inadequate medical care, and feelings of helplessness and hopelessness. Inescapable poverty leads to chronic, high levels of physical and social stress that increase the risk for poor health and vitality. Poverty and deprivation can undermine an individual's sense of control and rob individuals of the optimism needed for a healthy life (Angel & Angel, 2006). Poverty, low educational levels, and other social disadvantages are general underlying causes of poor health, but these economic and social disadvantages are not randomly distributed throughout the population and are greatest among African American women.

### *Culture*

Some factors common in African American culture that may specifically impact the health of African American women with type 2 diabetes include diet and self-care practices. In this review of literature, culture is defined as the customary beliefs, social forms, and material traits of a group (McGoldrick, Giordano, & Garcia-Preto, 2005). The literature related to diabetes and African American cultural variables was reviewed; diet and self-care emerged as subcategories.

*Diet.* Eating patterns and habits are important contributory factors to African American women's disproportionate obesity and many chronic diseases such as diabetes (Hargreaves et al., 2002). Though African Americans show considerable variability in how they approach planning, choosing, preparing, and eating food, there are some commonalities. The meaning of food is influenced by personal, cultural, and environmental contexts that place African American women at high risk for poor eating choices. According to an anthropological study of 23 African Americans, Liburd (2003) concluded that it may be challenging for African-American women with type 2 diabetes to change dietary patterns due to the highly ritualized nature of eating and selecting foods as well as the meanings embedded in those foods and food-centered events. This perspective was supported in a focus group study of African American women (n=40) at high risk for diabetes (Hargreaves et al., 2002). Participants shared that attempts to eat ‘healthy’ were often overcome by traditions, social influences, habits, and food cost. A strong connection between food and social life was revealed. Cost and availability of food were important logistical considerations. Contextual factors for eating included ubiquitous availability of fast foods, snacks, and convenience foods. Participants explained that when and where food is eaten was as important as what was consumed. Taste, habits, health, cost, social occasions, and emotions were reported as important influences on eating behaviors. Both positive (e.g., interest, enthusiasm, boredom, laughter, empathy, action, or curiosity) and negative (e.g., apathy, grief, fear, hatred, shame, blame, regret, resentment, anger, or hostility) emotions evidenced variable effects on the choice of when and what to eat.

James (2004) conducted six focus groups with African Americans (19 women and 21 men) at risk for diabetes. The focus groups centered on factors influencing food choices, dietary intake, and nutrition-related attitudes. The general perception communicated in these groups was that eating healthy means giving up cultural heritage and conforming to dominant culture. These focus groups further supported the idea that African Americans tend to gather together with extended family and friends on a regular basis and food is usually a large part of those gatherings (Ahye et al., 2006; Black, 2002; Scollan-Koliopoulos, 2004). Female participants reported that male partners and children were barriers to healthy eating (James, 2004). Friends and relatives usually were not supportive of dietary changes. Participants identified several barriers to eating healthy including: no sense of urgency, social and cultural symbolism of certain foods, poor taste of healthy foods, expense of healthy foods, and lack of information about healthy choices.

In a grounded theory investigation, Ahye et al. (2006) sought to understand intergenerational family roles and food management strategies of African American women from a socio-ecological perspective. Purposively selected groups of three generation families of African American women (n=30) from low- and moderate-income communities participated. Daughters in the study reported good health, mothers reported hypertension and moderately good health, and grandmothers reported one or more diet-related chronic disease(s) including diabetes. Responsibility, a feeling of duty to provide food and meals for family members (maternal role), social connection reflecting value for bringing family members together through food, caretaking of others in the family, reward for a lifetime of caring for others, and equal opportunities to use food and meals as shared commodities emerged as themes for managing food and nutrition. These findings also support the aforementioned anthropological review (Liburd, 2003) which portrayed food and eating as a ritual communicative of history, memory, social status, and feelings. Food was viewed as material and spiritual capital in the African American culture.

All of the studies in this sub-category are qualitative in nature. Though they provide a rich description and foundation for further study, these explorations do not quantitatively explore associations and correlations of nutrition and type 2 diabetes diagnoses, morbidity, and mortality in this population. Studies incorporating mental health, biomarkers of health, and social support could further explain the impact of diet on diabetes as well as any confounding variables and interventions that may improve this effect.

*Self-care*. The risk of developing type 2 diabetes and its complications increases with body weight and sedentary lifestyle (Black, 2002). Ethnic minority adults demonstrate higher rates of inactivity and overweight than do Caucasians. Prevalence of obesity is 13% higher among African American women than African American men. One explanation is that African American women are more likely than Caucasian women to be physically inactive (Black, 2002; Read & Gorman, 2006).

In a qualitative study, Becker et al. (2004) utilized focus groups to study the cultural basis of self-care practices of chronically ill African American women and men (n=167). The most common illnesses were diabetes, asthma, and heart disease. Participants emphasized that the concept of a right to self-care never materialized as a galvanizing issue for African Americans. The “survival arsenal” for African Americans with chronic illness(es) involved family structure and organization based on cultural beliefs and health practices. Participants reported preferring group affiliation (such as church) over individuality and identified social support, advice, spirituality, and nonbiomedical healing traditions as the primary culturally-based factors central to development of self-care approaches. In a similar qualitative study of self-management of type 2 diabetes in rural African Americans (n=73, 57% female), Utz et al. (2006) reported congruent findings. Their focus group participants described individual coping strategies such as calming techniques, prayer, and writing down problems as examples of resilience and strength. Participants conveyed that emotional support was highly valued and came from a wide variety of sources such as parents, adult children, relatives, and friends. In these qualitative studies, it is unclear how these beliefs translated into diabetes self-management and outcomes.

The specific experience of a convenience sample of nine African American women living with type 2 diabetes was explored in a study utilizing structured interviews (Burns & Skelly, 2005). Self-management in participants was hindered by denial and depression surrounding diagnosis as well as inadequate diabetes education from healthcare providers. Self-management was enhanced by talking to others with diabetes and trusting God. Anticipatory loss was a common major concern and overall participants considered living with diabetes as a major challenge. Perhaps this study could have been enhanced with the incorporation of a quantitative element involving metabolic outcome measures and their association with these emergent themes.

Several quantitative studies specifically considering self-management in African American women exist. The relationships among demographics, self-efficacy, locus of control (LOC), and self-management (functional status, HbA1c) in a convenience sample of African American women with type 2 diabetes (n=75) were explored in a descriptive pilot study (Montague, Nichols, & Dutta, 2005). Self-efficacy, HbA1c, and LOC were above average and significant correlations were found among LOC, self-management, and HbA1c. Self-management of diabetes was inadequate as indicated by above average HbA1c levels (8.1. mg/dL). Participants reported problems accomplishing daily tasks as a result of feeling anxious or depressed.

In an exploratory study of African American women with type 2 diabetes (n=31), the role of self-care through exercise was considered (Koch, 2002). The researcher considered whether participants who regularly exercised had significantly different health beliefs than those who did not in a non-experimental, ex-post facto, comparative study. The convenience sample included two groups: “exercisers” (n=17) and “non-exercisers (n=14).” There was a statistically significant difference in barriers to exercise (t=-7.21, df=29, p<0.001) and benefits of exercise (t=7.85, df=29, p<0.001) between groups. There was no significant difference between the groups concerning health beliefs. HbA1c was significantly different between the groups (t=-7.43, df=29, p<0.001) with lower levels in the "exercisers" group. Though exercise seemed to be an important factor in this study, researchers did not take into account other specific behaviors that may have influenced HbA1c such as diet, social support, mental health, and spirituality. The sample size was also small.

Two similar intervention studies involving African American women with type 2 diabetes explored self-management issues. The first study (n=41) was a randomized study considering the effectiveness of an in-home symptom-focused teaching/counseling intervention compared to a control group who received two pre-intervention visits, a midpoint telephone call, and a final evaluation visit (Skelly, Carlson, Leeman, Holditch-Davis, & Soward, 2005). Intervention participants showed statistically significant improvements in symptom distress, medication, diet, self-care practices, quality of life, and glucose monitoring. Both groups evidenced improvement of HbA1c levels and there was no significant improvement difference between groups. Quality of life improvements were statistically greater in the intervention group for mental and social wellbeing. Participation in regular exercise did not improve in either group. In the second in-home symptom-focused diabetes intervention in African American women with type 2 diabetes (n=180), participants were randomized to an in-home symptom-focused interventions or an attentional control group (received modules addressing weight management) and were evaluated at baseline and 3, 6, and 9 months (Skelly, Carlson, Leeman, Soward, & Burns, 2009). As in the previous study, there was a significant decrease in HbA1c from baseline for the entire sample but no significant difference between study arms. There were also significant changes in symptom distress, diabetes-related quality of life, symptom management, and self-care across study arms but no significant differences between the two groups. Exercise levels did not increase in either arm. The self-care practices that improved over the course of this study did not mediate effects on HbA1c, quality of life, or symptom distress. In both studies, participants' HbA1c levels were significantly lower regardless of intervention. This poses a question concerning the impact of individual attention and psychosocial support regardless of focus. It is possible that intervention and attentional control groups were both successful in changing behaviors and improving health outcomes but the factors influencing those changes are less understood.

Culture is an important consideration in understanding the context of diabetes care in African American women. The meaning of food is highly influenced by cultural factors and eating healthy may indicate rejection of cultural heritage and conforming to dominant culture (Liburd, 2003). African American women's family roles as multigenerational caregivers (Ahye et al., 2006) and keepers of culture (Becker et al., 2004; James, 2004; Liburd, 2003) impact their ability to engage in self-care. Often, there is a lack of family support for changes in health behaviors (Hargreaves et al., 2002; James, 2004). African American women also report mental health concerns related to their diabetes as hindrances to self-management (Burns & Skelly, 2005; Montague et al., 2005). Lack of regular exercise is a consistent concern (Skelly et al., 2005; Skelly et al., 2009).

### *Gender and Sex.*

For the purposes of this review, sex and gender are viewed as overlapping and influencing rather than distinct concepts. The delineations provided by Lips (2001) have been adopted: *sex* refers to male-female differences related to biology and anatomy; *gender* refers to differences resulting from the complex intersectionality of biological and social processes as well as cultural expectations of masculinity versus femininity. Diabetes prevalence is comparable across gender and sex, but among women, the disease generally has a more devastating biological impact and is more difficult to control (Black, 2002). This factor is most striking among African American women. “It is thought that much of this difference … results from varying rates of obesity, physical activity, and hormone action” (p. 546). Certain sociocultural factors, such as the roles women play in the family as keepers of culture and multigenerational caregivers, are also important considerations. African American women are at a substantially elevated risk for many other risk factors for diabetes including low socioeconomic status, obesity, inactivity, depression, and increased risk of gestational diabetes (Hargreaves et al., 2002).

The frequency and correlates of perceived societal racism were explored in a cross-sectional study of older African American (n=42) men and women (71%) with type 2 diabetes (Moody-Ayers, Stewart, Covinsky, & Inouye, 2005). Researchers found that men reported a higher mean lifetime exposure to societal racism. Greater passive coping (i.e., avoidance and denial) was associated with being female and greater active coping was associated with male sex, higher income, and good to excellent self-rated health. No relationship was found with lifetime exposure to racism andHbA1c. The sample size was small in this study and additional factors including psychosocial support, health behaviors, and self-care were not considered.

Several studies compared African American and Caucasians women with type 2 diabetes. In a focus groups separated by ethnicity, the feelings of depression, anxiety, and anger experienced by women with type 2 diabetes (n=41) were explored (Penckofer, Ferrans, Velsor-Friedrich, & Savoy, 2007). Participants reported struggling with changing health, challenges in relationships, anxiety, multicaregiving, and needing relief as major themes associated with their daily living. They expressed feelings of depression, anxiety, and anger related to having and managing diabetes and being caregivers. There were more similarities than differences noted by race. In a descriptive, cross-sectional secondary analysis of rural whites (n=53) and urban blacks (n=50), the physiological, psychosocial, and self-management characteristics of women with type 2 diabetes were examined (Melkus, Whittemore, & Mitchell, 2009). Despite having regular primary care, the women had poor glycemic control. The black women with diabetes were diagnosed younger, worked more hours, and were of lower SES than the white women. They had worse glycemic control (8.96 vs. 7.69 mg/dL), less support, and significantly higher levels of diabetes-related emotional distress. The secondary analysis was limited in that data collected from two independent samples were included. Though the findings from these studies are mixed, both illustrated the mental and physical challenges associated with type 2 diabetes management in women.

Women to Women (WTW) was a research-based, controlled computer intervention for chronic illness management in rural women (Cudney, Sullivan, Winters, Paul, & Oriet, 2005). Participants (n=120) had a variety of chronic illnesses including cancer, diabetes (16%), rheumatoid conditions, and multiple sclerosis. Participants reported having an illness over which there was no control, feeling uncertain about the illness' course, and difficulty maintaining a positive outlook over the long-term as the most difficult parts of living with a chronic illness. Stress was a common factor and it was attributed to uncertainties about health, finances, and life in general that they were otherwise unable to express as well as a limited ability to meet multiple responsibilities in home and family. Participants also reported difficulties relating to other people in their lives (family and/or friends), feelings of isolation, fears of being rejected by friends when mentioning illness difficulties, and misunderstandings among family members about the toll disease takes on energy levels. The most difficult times for these women were when family and friends began to show weariness and burnout as they tried to help. These researchers' provided a valuable contribution to the understanding of how chronic disease management impacts women emotionally. However, the results are limited in applicability to the present literature review as it is unclear how many women were African American and only 16% of participants had diabetes.

Women newly diagnosed with type 2 diabetes expressed feelings of being "home alone" during their initial self-management experiences, in spite of requisite knowledge and skills after completing a state-of-the-art multidisciplinary diabetes educational program in a study by Rayman and Ellison (2004). Personal engagement in new self-management processes resulted in strong emotional responses, self-blame, and negative characterizations. The women in this study (n=11) were trained during a week-long diabetes education program taught by a multidisciplinary team; lack of management knowledge was not an issue for participants. Ethnicity of participants was not reported. The social context of the illness experience was reported as an important part of learning intensive self-management. Participants who struggled with daily self-management reported that they blamed themselves and created additional stressors from within. They could not relate their struggles (i.e., anger, hurt, frustration, and/or depression) to any aspect of their self-management and so did not believe they should ask health providers for assistance. Simply being emotional, in their eyes, was not a legitimate illness management issue. Yet these very intense feelings accounted for periods of "opting out" of self-management. Correlating diabetes-outcomes (i.e., HbA1c) and health behaviors with participants' emotional levels would have strengthened this study.

There is little literature specifically addressing the impact of female sex/gender in African Americans with type 2 diabetes. The implications from the literature reviewed in this article are that women need psychosocial support (Cudney et al., 2005; Melkus et al., 2009; Penckofer et al., 2007), have multiplecaregiving roles (Cudney et al., 2005; Penckofer et al., 2007), and various reactions to diabetes diagnosis and management (Cudney et al., 2005; Melkus et al., 2009; Moody-Ayers et al., 2005; Penckofer et al., 2007; Rayman & Ellison, 2004).

### *Mental Health*

Mental health is a state of mind relative to a person's ability to cope with and adjust to the recurrent stress of everyday living in acceptable ways (Black, 2002). In the US, women experience higher rates of mental disorders than men; for example, depression is experienced at roughly twice the rate (National Institute of Mental Health, 2009). Mental and physical stress impair glucose tolerance and therefore negatively influence glycemic control (Black, 2002; Wagner & Abbott, 2007). Multiple stressors contribute to the development of co-morbid chronic health conditions in those with diabetes including ESRD and cardiovascular disease. In African American women, higher rates of depression are associated with obesity (de Groot et al., 2003). These statistics raise questions about the impact depression may have on the development and progression of diabetes for this population. African Americans have higher rates of recurrent stress compared to Caucasians; they report lower levels of life satisfaction and happiness as well as higher levels of mistrust (Neighbors & Williams, 2001). The prevalence of mental health concerns in African American women with type 2 diabetes should be considered in the context of their physical and emotional well-being (Bertera, 2003).

Rubin and Peyrot (1999) reviewed the published, English-language literature on self-perceived quality of life among adults with diabetes and concluded that having better glucose control was associated with better quality of life as measured by physical and social functioning. Discussed previously in this review, Fisher (2005), who evaluated the associations between type 2 diabetes management behaviors and family characteristics among various ethnic groups (n=509), suggested that higher depressive affect was strongly associated with specific family risk indicators (pessimistic belief in world as meaningful and manageable, inability to resolve disease-related problems within the family, general dissatisfaction with partner/spousal relationship, tendency to do things without family members) and decreased effectiveness of diabetes-related interventions.

Two similar studies specifically addressed racial differences in the discussion, diagnosis, and treatment of depressive symptoms in those with diabetes. Wagner, Perkins, Piette, Lipton, and Aikens (2009) compared rates of discussion and treatment of depression among African Americans (55%) and whites (45%) with type 2 diabetes (n=289, 55.6% female). Of the participants, 23% had elevated depression symptoms as indicated by their responses to the Patient Health Questionnaire-9. After adjusting for SES, insulin use, and number of depressive symptoms, African Americans in the study were 5.9 times less likely than their white counterparts to have discussed their depressive symptoms with anyone. African Americans were also significantly less likely to have talked about their depressive symptoms with a primary care provider, seen a psychiatrist, or been prescribed an antidepressant. There were no racial differences in likelihood of conversing about depression with clergy, friends, family members, or a psychologist/counselor. In a cross-sectional study of individuals with type 2 diabetes (n=740), Wagner, Tsimikas, Abbott, de Groot, and Heapy (2007) investigated racial/ethnic variation in: depressive symptoms, patient-reported physician-diagnosed depression, and patient-reported pharmacological depression treatment. The authors also considered the effects of demographic and diabetes-related variables on these outcomes. Participants in this studied identified themselves as White (64.6%), African-American (26.7%), and Latino (8.7%) and were predominantly female (61.6%). After adjusting for sex, age, and number of diabetes complications, there were no significant differences by race/ethnicity for depressive symptoms. However, African-Americans were significantly less likely to be diagnosed with depression than whites; although Latinos did not significantly differ from whites. African Americans with depression were less likely to report pharmacotherapy than whites; Latinos were excluded from this domain analysis due to low-counts which violated statistical assumptions.

Perceived discrimination and depression were explored in a convenience sample of African Americans (n=120, 74.2% female) with type 2 diabetes (Wagner & Abbott, 2007). Perceived discrimination was related to depression and was more stressful for women than men. Other independent significant predictors of depression included HbA1c and female sex. These results may not be representative as recruitment was from health fairs. Attendees may have been more attentive to health than non-attendees.

A heuristic model of factors associated with mental and physical health of African-American mothers with type 2 diabetes has been developed (Murry et al., 2003). The researchers incorporated the interlocking oppressors of race and sex in order to explain their influence on the stressors and demands African American women with diabetes experience. According to the model, the combined effects of social, individual, and family stressors generate endemic stress that can evoke coping behaviors that may compromise psychological and physical health of these women. The researchers proposed that the differential impacts of type 2 diabetes on African American women may be attributed to the necessary balance of the demands associated with managing illness in the face of multiple stressors across several life domains. These stressors in the face of type 2 diabetes in African American women (n=45) were examined in a cross-sectional, descriptive study (Collins-NcNeil et al., 2007). Significant associations between depressive symptoms and cardiovascular disease (CVD) risks were found. Those with greater depression severity had poor diabetes self-management (higher BMI and HbA1c). There were few participants with clinically significant depression in the sample and this may have impacted results.

Depression is associated with type 2 diabetes management and outcomes (deGroot et al., 2003; Wagner & Abbott, 2007). However, according to the literature reviewed in this article, African Americans are less likely to be diagnosed with depression and prescribed pharmacotherapy treatment for depression despite no known differences in depressive symptoms and prevalence by race (Wagner et al., 2009; Wagner et al., 2007). Undiagnosed and under-treated depression may be one of many factors related to differential diabetes outcomes in African American women.

### *Spirituality*

According to a review by Musgrave, Allen, and Allen (2002), the relationship between spirituality and health provides an important perspective for general public health intervention. Taken together or separately, religiosity and spirituality provide a framework for making sense of the world and coping with life. Spirituality among African Americans tends not to be abstract but rooted in relationships and community. Many African American women hold belief in God and prayer as health-protective behaviors and  are more likely to participate in institutional religious behaviors and activities than African American men. Positive relationships exist between belief in God, life satisfaction, and health-promoting attitudes. Some ideas and beliefs related to spirituality have been shown to influence management and outcomes of type 2 diabetes

(Gavin & Wright, 2007); and spiritual practices play an important role in self-care and disease management (Utz et al., 2006). Historically, African American churches have played an essential social and psychological role in the lives of their members. In the African American community, church is characterized as a healing resource (Becker et al., 2004).

Health perceptions, beliefs and attitudes, intentions, and social pressures that influence health promoting behaviors as expressed by community level aggregates of African American women with faith support via congregational health ministry programs were documented in a study by Drayton-Brooks and White (2004). They found that health beliefs, attitudes, and behaviors are developed within social systems, and therefore, the facilitation of healthy lifestyle behaviors may be best assessed and influenced within a context of reciprocal social interaction such as in a faith-based community. The African American women (n=26) with heart disease or diabetes in these focus groups expressed concerns that health educators desire to teach communities but fail to determine what groups already know or want to know and why people behave the way they do. Participants reported prayer, relationships with others, pastoral support, feeling included and accepted, and trusting healthcare providers as factors associated with health promotional activities. Discomfort with unfamiliar people, feeling excluded, and being alone were reported as barriers to health-promoting lifestyles. Social pressures to eat unhealthily included generously portioned, high-fat meals at church functions as well as the pressure to eat food served by other church members. Avoidance of certain foods could be interpreted as mistrust of food preparation. Limited commitment to behavioral change, interpersonal relationships, stressful lifestyles, and personal preferences were the leading subjective norms. Participants were more likely to come into a church environment for health promotional programs due to the comfort of congregational support. This was also supported in an aforementioned study by Rayman and Ellison (2004), who found that greater emphasis on the environmental context of and the sociocultural influences on health-related behaviors were indicated. In the faith-based community, women have found the inclusion, acceptance, open communication, friendship, and inspiration necessary for healing and health promotion (Drayton-Brooks & White, 2004; Rayman & Ellison, 2004).

Using findings from their grounded theory study of spirituality in 29 African American men and women (65.5%) with diabetes, Polzer and Miles (2007) developed a theoretical model for how spirituality affects individuals' self-management of type 2 diabetes. Three typologies of spirituality emerged from participants: (1) relationship and responsibility – God in background; (2) relationship and responsibility – God in forefront; and (3) relationship and relinquishing of self-management – God as healer. In diabetes management, God in background is associated with personal acceptance of responsibility for diabetes self-management in a collaborative relationship with God. When God is in the forefront, He is given the major responsibility for diabetes management and outcomes. Participants who viewed God as healer also managed their diabetes through a relationship with God. However, this relationship involved trusting God and relinquishing self-care responsibilities to Him. Each typology reflects African American spirituality as relational but not universal in interpretation. Spirituality provided support to African Americans in dealing with chronic illnesses such as diabetes, yet the process of spirituality and self-management may not be same for all. In a continuation of this study, perceptions of African Americans with type 2 diabetes regarding their healthcare were explored (Polzer, 2007). Participants perceived spiritual relationships with their healthcare providers as important. Those considering God in background wanted providers to be partners in healthcare. When God was in forefront, participants wanted providers to be instruments of God. Those viewing God as healer also saw their providers as partners in care. These partners were expected to support patients' choices to relinquish self-management to God. These findings were not linked to biomarkers of diabetes control.

Spiritual well-being scores of African American (n=31) and Caucasian (n=27) women receiving hemodialysis for management of ESRD were compared in a cross-sectional study (Tanyi & Werner, 2007). African American participants scored higher on religious well-being than did Caucasian participants. Areas of spiritual strength for African American women included perceptions of God's concern for them, God's help with loneliness, fulfilling relationships with God, satisfaction with life, and a sense of purpose. They relied on religion more for coping than Caucasian women. They reported seeking God's guidance, closeness, and support in their daily lives to manage health problems. African American women on hemodialysis were more satisfied with their lives and expressed a stronger sense of future direction and purpose in life when compared to the Caucasian women on hemodialysis.

As evidenced above, spirituality plays an important part in diabetes management in African American women (Drayton-Brooks & White, 2004; Polzer, 2007; Rayman & Ellison, 2004; Tanyi & Werner, 2007). The faith community can be a safe place for inclusion, acceptance, inspiration, and support for healing and health-promotion (Drayton-Brooks & White, 2004; Musgrave et al., 2002). African American women report higher religious wellbeing than Caucasian women with diabetes complications and utilize that relationship with God to receive higher levels of life satisfaction and a greater sense of purpose (Tanyi & Werner, 2007).

## Discussion

It is clear from this review of literature that more than medical concerns and the quality of medical care affect outcomes for individuals with type 2 diabetes and other chronic illnesses.

Factors such as psychosocial support, SES, culture, gender and sex, mental health, and spirituality along with their sequelae all impact and are associated with type 2 diabetes self-management and outcomes. Researchers have not shown that any of these elements individually and completely account for type 2 diabetes outcomes. The disparate care and outcomes of African American women with type 2 diabetes have not specifically been given much attention in the literature and are certainly an area for further research. The multiple factors that have individually been shown to impact outcomes are evidence for the need to consider the whole biopsychosocial-spiritual context of care especially in the unique experience of African American women with type 2 diabetes.

African American women face a significantly higher burden of type 2 diabetes as well as a higher rate of undesirable diabetes-related outcomes. Researchers have shown that though type 2 diabetes is a biomedical disease, the discrepancies in diagnoses and outcomes cannot be solely explained by biological factors or differences in access and adherence to healthcare (Heisler et al., 2003). An intricate biopsychosocial-spiritual relationship exists that must be further explored and understood to help eliminate these health disparities in African American women with type 2 diabetes. The biopsychosocial-spiritual context of care must be considered in efforts to better understand and reduce the disparities in type 2 diabetes management and outcomes in African American women.

Few individual components of the complex biopsychosocial-spiritual aspects of type 2 diabetes management in African American women have been explored in studies of only African American women with type 2 diabetes. As evidenced in this review, researchers have supported various biopsychosocial-spiritual factors impacting disease management and outcomes in type 2 diabetes management in African American women, but none have provided an inclusive combination of culture, gender and sex, psychosocial support, SES, mental health, and spirituality in one study. These components individually explain some aspects of the health-related disparities that exist in this population and their combination is of import to consider.

In reality, there is likely an additive impact of the multifaceted biological, psychological, social, and spiritual factors inherent in diabetes management and health-related outcomes (Murry et al., 2003). While psychosocial support (Whittemore et al., 2005) , SES (Becker et al., 2004), culture (Montague et al., 2005), sex and gender (Rayman & Ellison, 2004), mental health (Collins-McNeil et al., 2007), and spirituality (Tanyi & Werner, 2007) all individually impact diabetes-related management and outcomes, the combination of these (and possibly additional) factors is likely very powerful. Further research considering how these mediators may be targeted in a way that may impact the more static moderators of disease management and hence, diabetes outcomes, is warranted.

African American women may benefit from interventions designed specifically to address their unique experiences with health and type 2 diabetes. The literature reviewed here supports the concept that while the various biopsychosocial-spiritual factors discussed impact all individuals with type 2 diabetes, their impacts are different based on the individual and their culture, ethnicity, and gender. Therefore, in order to address the disparities in type 2 diabetes that exist with African American women, more in-depth investigation into the biopsychosocial-spiritual factors that impact type 2 diabetes care in this population needs to occur; more new interventions based on this research need to be developed; and research testing the efficacy of these biopsychosocial-spiritual interventions is required.

In the future, researchers should focus on what interventions simultaneously improve health outcomes and quality of life in this population while also exploring connections among these biopsychosocial-spiritual components of illness as well as whether some are better predictors and mediators than others. This exploration must include investigating and incorporating the strengths and resiliency unique to African American women.

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# Chapter 2: Research Article

# Abstract

*Aims*: We utilized a cross-sectional survey of African American women with type 2 diabetes (n=58) to explore demographic and biopsychosocial-spiritual variables related to diabetes control (HbA1c). Associations between BMI and depression severity (PHQ-9) and demographic and biopsychosocial-spiritual variables were considered.

*Methods*: Participants were surveyed with the following scales: Diabetes Care Profile, Patient Health Questionnaire-9 (PHQ-9), Family Crisis Orientation Personal Evaluation, Illness Cognition, Health Distress, and Basic Adlerian Scales for Interpersonal Success. BMI and current HbA1c were extracted from charts.

*Results*: According to hierarchical regression analyses, the biopsychosocial model trended toward significant prediction of the variance in HbA1c (Adjusted $R^2$=0.10, p=0.06); the demographic and biopsychological model explained 27% (Adjusted $R^2$=0.27, p<0.001) of the variance in BMI; and the demographic and biopsychosocial-spiritual model explained 52% (Adjusted $R^2$=0.52, p<0.001) of the variance in PHQ-9 scores. Disability status was a significant individual predictor of BMI (β=0.32, p=0.02). Health distress (β=-0.34, p=0.01) and social/personal factors (β=0.34, p=0.03) were individually significant predictors of PHQ-9.

*Conclusions*: Biopsychosocial-spiritual factors influencing type 2 diabetes in African American women are complex. A revised framework of biopsychosocial-spiritual factors may be more predictive of HbA1c and diabetes risk factors in this population. This warrants further investigation in efforts to improve type 2 diabetes management and outcomes.

*Key words*: type 2 diabetes, disparities, African American women, biopsychosocial-spiritual

## Introduction

In ethnic minority groups, the impact of type 2 diabetes, in terms of prevalence, quality of life, death, and disability, is often magnified (Elders & Murphy, 2001). After adjusting for population age differences, non-Hispanic African Americans are 1.8 times more likely to have diabetes than Caucasians (American Diabetes Association [ADA], 2006). Researchers project diabetes diagnoses in African Americans will increase 50% by the year 2020 as compared to a 27% increase for Caucasians. One in five African American women older than 60 years have type 2 diabetes (Skelly, Carlson, Leeman, Soward, & Burns, 2009). African Americans, especially African American women, with type 2 diabetes have consistently higher rates of end-stage renal disease (ESRD), neuropathy, retinopathy, blindness and non-traumatic lower-extremity amputations (Konen, Summerson, Bell, & Curtis, 1999).

African Americans with diabetes have worse glycemic, lipid, and blood pressure control than other groups (Harris, Eastman, Cowie, Flegal, & Eberhardt, 1999). Although African Americans have poorer symptom control, few researchers have demonstrated that they, specifically women in this ethnic group, receive less aggressive biomedical treatment for their type 2 diabetes compared to their Caucasian counterparts (Chin, Zhang, & Merrell, 1998; Harris et al., 1999; Heisler, Smith, Hayward, Krein, & Kerr, 2003). Differences in medication adherence and other self-management practices have been identified (Trinacty et al., 2007). However, targeting medication adherence alone is unlikely to reduce diabetes control in any population including African American women (Adams et al., 2008).

The individual aspects of type 2 diabetes (i.e., glycemic control, demographics, BMI, and/or medication adherence) do not solely explain the disparities between ethnic groups in prevalence, morbidity, and mortality of this disease (ADA, 1999). Characteristics of the disease, home environment, and treatment together explained about 94% of the variance of blood glucose control in a study of children with type 1 diabetes (Nichols, Hillier, Javor, & Brown, 2000). Though African Americans with diabetes have more severe disease progression at the initiation of treatment, one cannot underestimate the unmeasured biological, cultural, and/or environmental determinants of health that may explicate the disparities in the management, progression, and outcomes of diabetes in this population (Adams et al., 2008).

African American women are at a significantly elevated risk for type 2 diabetes and its complications (Black, 2002; Hargreaves, Schlundt, & Buckowksi, 2002). Some identified risk factors particular to African American women include low socioeconomic status (SES), obesity, less physical activity, depression, and higher prevalence of gestational diabetes. Even after adjustment for SES, age, and marital status, African American women fare worse than men in their same racial/ethnic group in standard measures of health and have the highest rates of life-threatening conditions among Caucasians, Mexicans, Puerto Ricans, and Cubans as well as African American men (Read & Gorman, 2006).

Considered synergistically, the abovementioned factors form a biopsychosocial hypothesis for contextually understanding the disparate health outcomes in African American women with type 2 diabetes. Researchers and clinicians who approach this biopsychosocially conjecture that biological, psychological, and social factors all contribute to human functioning and health (Engel, 1977). The biopsychosocial approach has been expanded to incorporate the metaphysical elements (i.e., spirituality) of individuals in context as well (Wright, Watson, & Bell, 1996).

### *Statement of the Problem*

The social context in which individuals with type 2 diabetes live impact self-management skills, tasks, and motivation. Biological, psychosocial, and spiritual domains have been correlated with diabetes self-management and outcomes (Lesniak, Rudman, Rector, & Elkin, 2006; Polzer & Miles, 2007; see Weihs, Fisher, & Baird, 2002, for a review). Though a relationship between diabetes and these domains has been established, more research is necessary to understand the relationship among these spheres of influence and type 2 diabetes outcomes. There is limited literature in which researchers support various individual biopsychosocial-spiritual factors that impact disease management and outcomes in type 2 diabetes management in African American women. These components, such as dietary choices (Hargreaves et al. 2002), low SES (Angel & Angel, 2006; Becker, Gates, & Newsom, 2004), psychosocial support (Chesla et al., 2004; Misra & Lager, 2009), and mental health issues (de Groot, Auslander, Williams, Sherraden, & Haire-Johnson, 2003; Wagner, Perkins, Piette, Lipton, & Aikens, 2009), individually explain some aspects of diabetes-related disparities. None of these individual components fully account for the significant differences in prevalence, management, morbidity, and mortality. The systemic implications of collective biopsychosocial-spiritual factors related to type 2 diabetes rates, progression, and endpoints in African American women must be further explored in a way that specifically addresses the dearth of literature in the psychosocial realm as well as how these individual components interact to influence and impact diabetes management and outcomes.

## Method

A cross-sectional survey was utilized to explore the relative incidence, distribution, and interrelations of specified sociological and psychological variables in African American women with type 2 diabetes. The exploration was aimed at better understanding the nature and function of a confluence of demographic and biopsychosocial-spiritual factors and their relationship to clinical outcomes of diabetes management and biopsychosocial-spiritual health. These variables include: disability status, years since diagnosis, hemoglobin A1c (HbA1c), body mass index (BMI), self-rated health, attitude toward diabetes, depression severity, illness-related cognitions , health-related distress, social/personal factors, belonging/social interest, and seeking spiritual support. The Diabetes Survey, a compilation of these independently validated surveys, was administered to each participant. Responses were correlated to biomarkers of diabetes management (HbA1c and BMI) found in participants' electronic medical records (EMRs) upon chart review. Institutional Review Board (IRB) approval was obtained and all patients were appropriately consented.

The primary outcome measure of type 2 diabetes control was HbA1c (ADA, 1999). BMI and PHQ-9 were also considered as additional outcome measures in the biopsychosocial context of diabetes management and outcomes. Both of these variables are associated with type 2 diabetes (Black, 2002).

### *Procedure*

*Participants.* African American women with a diagnosis of type 2 diabetes were participants. Researchers at the Center for Disease Control (CDC) who analyzed National Health and Nutrition Evaluation Survey (NHANES) data suggested that prevalence of type 2 diabetes in African American women is predominantly in those 45 years old and older (CDC, n.d.). The sampling frame consisted of patients meeting inclusion criteria who presented for scheduled general appointments to a primary care clinic located within an academic institution in the southeastern US. Inclusion criteria comprised female sex, African American ethnicity, age 45 years and older, and diagnosis of type 2 diabetes mellitus. The sample was one of convenience.

Upon arrival at their appointment, each eligible patient was asked to participate in a research project concerning African American women with diabetes. After providing consent, participants were administered the Diabetes Survey. A research assistant was available to help participants if they needed assistance and/or support. Participants received an incentive bag of diabetes supplies and information.

*Chart review.* Upon consent, participants' EMRs were reviewed for specific diabetes biomarkers. These reviews were conducted within two weeks of each participant's visit to the FMC. This ensured the most current chart information would coincide with their survey responses. Most recent HbA1c and BMI were extracted.

### *Measures*

Several established surveys and questionnaires were compiled to provide a comprehensive inventory of demographic information, diabetes knowledge and acceptance, self-care, psychological adjustment, and social support. Survey completion required approximately 45 minutes.

*Diabetes Care Profile.* The Diabetes Care Profile (DCP) is a survey regularly utilized by researchers to assess diabetes-related quality of life (Yanover & Sacco, 2008). The instrument has 234 items in seven sections (Achhab, Nejjari, Chikri, & Lyoussi, 2008). General demographics, including disability status and years since diagnosis, are also collected with the DCP. The sections of the DCP used in this study included: social/personal factors, positive attitude, and negative attitude. All sections of the DCP were not included due concerns regarding participant fatigue. The DCP is designed to assess the psychosocial factors related to diabetes

(Fitzgerald et al., 1996). These scales show adequate long-term test-retest reliability (between 0.38 - 0.48) and internal consistency in the social support scales. The questionnaire is based on the Health Belief Model (HBM) which is an attempt to explain and predict health-related behaviors from individuals' beliefs in their self-efficacy related to those behaviors (Rosenstock, 1990). Issues associated with diabetes knowledge, treatment, and beliefs are assessed. Cronbach's α for this survey has ranged from 0.54 - 0.97. The internal consistency reliability estimates obtained for subscales used in this study were adequate: Social/Personal Factors (α=0.867), Negative Attitude (α=0.743), and Positive Attitude (α=0.725). Researchers have utilized the DCP with various ethnicities including African Americans and have demonstrated that ethnicity has no impact on scores (Fitzgerald et al., 2000). Achhab et al. (2008) recommended the DCP in research evaluating broad conceptualizations of diabetes-specific quality of life.

*Patient Health Questionnaire-9.* The Patient Health Questionnaire (PHQ) is a self-administered diagnostic measure of common mental disorders (Kroenke, Spitzer, & Williams, 2001). Researchers typically utilize the PHQ-9 to evaluate each of the 9 DSM-IV criteria for depression. Concurrently, it assesses depression severity. Severity scores are as follows: minimal (1-4), mild (5-9), moderate (10-14), moderately severe (15-19), and severe (20-27). This instrument is a reliable (α=0.89) (Kroenke, 2001) and valid (BDI, r=0.73; GHQ, r=0.59) measure of depression severity (Martin, Rief, Klaiberg, Braehler, 2006). In the present study, the PHQ-9 was internally consistent (α=0.853). It can be used without adjustment in various ethnic populations including African Americans (Huang, Chung, Kroenke, Delucchi, & Spitzer, 2006).

*Illness Cognition Questionnaire.* The Illness Cognition Questionnaire (ICQ) is a self-report instrument developed to assess three generic illness cognitions indicating different ways of re-evaluating meanings across different chronic diseases (Evers et al., 2001). The generic cognitions are “helplessness as a way of emphasizing the aversive meaning…, acceptance as a way to diminish the aversive meaning, and perceived benefits as a way of adding a positive meaning…” (p. 1026). The ICQ is designed to evaluate the maladaptive function of helplessness and the adaptive function of acceptance and perceived benefits for the long-term psychological and physical health of patients with a chronic disease. Internal consistencies for all scales range from 0.84 - 0.91 (Cronbach’s α) in various samples and correlation coefficients between various measurement points indicate high test-retest reliability (all above 0.67). Reliability and validity have been established across several chronic diseases including multiple sclerosis and rheumatoid arthritis (Wollaars, Post, van Asbeck, Floris, & Brand, 2007), cerebral palsy, chronic fatigue syndrome, and fibromyalgia (Logie, Crombez, & Evers, 2007). Though the ICQ has not been studied specifically in African American women with type 2 diabetes, it was designed as a generic tool to assess maladaptive and adaptive functions of illness cognition across chronic diseases. In this study, internal consistency for each scale was adequate across subscales: Helplessness (0.868), Acceptance (0.858), and Perceived Benefits (0.834).

*Health Distress scale.* This is a subset of four questions from the Multiple Sclerosis Quality of Life (MSQOL)-54 instrument, which was designed to assess self-reported psychosocial consequences of multiple sclerosis (MS) (Solari, Ferrari, & Radice, 2006). Specifically, the HDS assesses discouragement, frustration, worry, and burden related to illness with a 6-point scale in which lower scores indicate higher amounts of health distress. Internal consistency reliability of the MSQOL-54 has been reported from 0.75 - 0.96 in individuals with MS (Vickrey, Hays, Harooni, & Myers, 1995). In that same population, test-retest intraclass correlation coefficients ranged from 0.67 - 0.96. Construct validity has been supported by correlations between MSQOL-54 scales and hospitalizations, depressive symptoms, and symptom severity. Though this scale has been primarily applied only to those individuals with MS and their families, assessing discouragement, frustration, worry, and burden related to illness in those with type 2 diabetes is of import. The HDS was internally consistent in the present study (α=0.848).

*Basic Adlerian Scales for Interpersonal Success – Adult Form.* The Basic Adlerian Scales for Interpersonal Success – Adult Form (BASIS-A) measures personality variables considered helpful in understanding a person's life approach (Curlette, Wheeler, & Kern, 1997). The specific purpose of this inventory is to help identify how one's individual life-style contributes to their problem solving approach related to social, work, and intimate relationships. Cognitive schema measured by the BASIS-A in this study was limited to the Belonging/Social Interest subscale. Estimates of internal consistency (coefficient α) for this subscale range from 0.82 - 0.87 (Curlette et al., 1997; Wheeler, 1996). Test-retest reliability shows a moderate level of stability; content and criterion-related validity have been established (Curlette et al., 1997, Wheeler, 1996). In this study, internal consistency reliability of the subscale was acceptable (0.798).

*Family Crisis Oriented Personal Evaluation Scales.* The Family Crisis Oriented Personal Evaluation Scales (F-COPES) were developed to identify problem-solving and behavioral strategies that families use in problematic and/or difficult situations (McCubbin, Olson, & Larsen, 1981). They draw on the two levels of interaction outlined in the Resiliency Model: family to social environment (how families externally handle problems and difficulties between members) and individual to family system (how families internally handle problems and difficulties between members) (McCubbin, Thompson, & McCubbin, 1996). The factor used to evaluate these levels of interaction in this study was Seeking Spiritual Support. The F-COPES have been used with African American populations (Hanline & Daley, 1992), chronically ill women (Woods & Lewis, 1995), and individuals with diabetes (Yates, Bensley, Lalonde, Lewis, & Woods, 1995). Overall reliability for the F-COPES has been reported to be 0.86 - 0.87 (Cronbach's α) (McCubbin et al., 1981). Internal reliability for the subscale in this study was strong (α=0.858). Validity and test-retest reliability are adequate (McCubbin et al., 1996).

### *Data analysis*

Appropriate correlations among HbA1c, BMI, PHQ-9, and biopsychosocial-spiritual predictor variables were conducted and the relationships among demographic variables were considered. Regression diagnostics for outliers, normal distribution, linear relationships between variables, reliability, and heteroskedasticity as well as checks for multicollinearity were performed via visual inspection of residual plots and computation of variance inflation factors for regression models. Hierarchical regression analyses were utilized to determine the demographic and biopsychosocial-spiritual variables associated with HbA1c, BMI, and PHQ-9. As an initial step, biopsychosocial-spiritual variables were examined to determine if they were relevant variables to include in each regression model. Including only a small number of covariates was optimal due to the relatively small sample size (Tabachnick & Fidell, 1996).

## Results

### *Participant Characteristics*

Sixty participants completed the Diabetes Survey. All but two of those participants had a current HbA1c upon review of their EMRs. Therefore, 58 individuals were considered. Participants' age, BMI, marital status, education, employment status, annual household income, household occupancy, and years since diagnosis are included in Table 1. Bivariate relationships were explored among variables and there were a few significant relationships with demographic variables and HbA1c, BMI, and/or depression severity (as measured by PHQ-9). HbA1c approached a significant relationship with years since diagnosis (r=0.254, p=0.06). Individuals who indicated "Disabled" for employment status had higher BMIs (t=4.03, p<0.001) and higher levels of depression (t=2.51, p=0.02) than those individuals who reported any other employment status (e.g., full- and part-time, retired, unemployed). Higher BMI was significantly associated with poorer self-rated health (r=-0.33, p=0.01). Finally, PHQ-9 scores were significantly correlated with self-rated health (r=-0.444, p<.001).

*Table 1*. Participants' Demographic Characteristics

| **Demographic** | | **N (58)** | **%** |
|---|---|---|---|
| **Age (in years)** | 45-54 years | 21 | 36.2 |
| | 65-74 years | 33 | 56.9 |
| | 75-84 years | 4 | 6.9 |
| **BMI** | Normal weight | 5 | 8.6 |
| | Overweight | 9 | 15.5 |
| | Obese | 27 | 46.6 |
| | Morbidly obese | 17 | 29.3 |
| **Marital status** | Never married | 12 | 20.7 |
| | Married | 16 | 27.6 |
| | Separated/divorced | 11 | 19 |
| | Widowed | 19 | 32.8 |
| **Education** | ≤ 8th grade | 7 | 12.1 |
| | Some hs | 14 | 24.1 |
| | Hs degree/GED | 18 | 31 |
| | Some college | 12 | 20.7 |
| | College degree | 6 | 10.3 |
| | Graduate degree | 1 | 1.7 |
| **Employment status** | Full-time | 9 | 15.5 |
| | Part-time | 3 | 5.2 |
| | Unemployed | 4 | 6.9 |
| | Retired | 20 | 34.5 |
| | Disabled | 22 | 37.9 |

| | | | |
|---|---|---|---|
| **Annual household income** | <$5,000 | 14 | 24.1 |
| | $5,000-$14,000 | 25 | 43.1 |
| | $15,000-$29,999 | 9 | 15.5 |
| | $30,000-$44,000 | 7 | 12.1 |
| | ≥ $45,000 | 3 | 5.2 |
| **How many live with you** | 0 | 14 | 24.1 |
| | 1 | 25 | 43.1 |
| | 2 | 7 | 12.1 |
| | 3 | 5 | 8.6 |
| | ≥ 4 | 7 | 12.1 |
| **Years since diagnosis** | ≤ 4 years | 14 | 24.1 |
| | 5-9 years | 22 | 37.9 |
| | 10-19 years | 10 | 17.2 |
| | 20-29 years | 10 | 17.2 |
| | ≥ 30 years | 2 | 7.14 |
| **Self-rated health** | Excellent | 8 | 13.8 |
| | very good | 18 | 31 |
| | Good | 23 | 39.7 |
| | Fair | 6 | 10.3 |
| | Poor | 3 | 5.2 |

Mean HbA1c was 8.3 mg/dL (SD=1.9) with a range of 5.7-12.7 mg/dL. HbA1c at or below the ADA's recommended target of 7.0 mg/dL was reported for 36.2% (n=21) of participants. HbA1c was significantly correlated with PHQ-9 (r=0.296, p=0.05) and Social/Personal Factors (r=0.276, p<0.001); it approached significance in an inverse relationship with Belonging/Social Interest (r=-0.242, p=0.06).

Mean BMI was for participants was 36.2 (SD=8.4). A little over three-fourths (75.9%, n=44) of participants were either obese or morbidly obese. Of these participants, 37.9% (n=22) reported that they were "disabled" or "retired" 34.5% (n=20). Higher BMI was significantly correlated with greater health distress (r=-0.425, p=0.001).

*Survey Results*

Thirty-one participants (53.4%) reported some level of depression on the PHQ-9. Depression severity ranged from mild (24.1%, n=14), moderate (13.8%, n=8), moderately severe (8.6%, n=5), and severe (6.9%, n=4). PHQ-9 scores were correlated significantly with HbA1c (r=0.296, p=0.05); Positive Attitude (r=-0.459, p<0.001); Negative Attitude (r=0.477, p<0.001); ICQ – Helplessness (r=0.52, p<0.001), Acceptance (r=-0.41, p=0.001), and Perceived Benefits (r=-0.30, p=0.02); greater Health Distress (r=-0.64, p<0.001); and Seeking Social Support (r=-0.30, p=0.02).

*Hierarchical Regression Analyses*

Three hierarchical regressions were developed to examine the relationships between dependent variables (HbA1c, BMI, and PHQ-9) and their respective relevant biopsychosocial-spiritual predictors. Significant covariate relationships between demographic and biopsychosocial-spiritual variables and each dependent variable are delineated in Table 2 where Pearson correlations (r) were reported for continuous independent variables and compared mean score (t) was reported for disability status as it was a categorical variable. Variables were entered hierarchically by category: demographics, biological, psychological, social, and spiritual to examine each aspect of a biopsychosocial-spiritual framework.

*Table 2.* Significant Covariate Relationships

| **Independent Variable** | **HbA1c** | **BMI** | **PHQ-9** |
|---|---|---|---|
| ***Demographics*** | | | |
| Disability | | t=4.03 (0.000) | t=2.51 (0.015) |
| ***Biological*** | | | |
| Length of Diagnosis | r=0.254 (0.056) | | |
| HbA1c | | | r=0.296 (0.05) |
| Self-rated Health | | r=-0.325 (0.013) | r=-0.444 (0.000) |
| ***Psychological*** | | | |

| | | | |
|---|---|---|---|
| Positive Attitude | | | r=-0.459 (0.000) |
| Negative Attitude | | | r=.477 (0.000) |
| PHQ-9 | r=0.296 (0.05) | | |
| ICQ Helplessness | | | r=0.517 (0.000) |
| ICQ Acceptance | | | r=-0.414 (0.001) |
| ICQ Perceived Benefits | | | r=0.299 (0.023) |
| Health Distress | | r=-0.425 (0.001) | r=-0.635 (0.000) |
| ***Social*** | | | |
| Social/Personal Factors | r=0.276 (0.041) | | r=0.645 (0.000) |
| Belonging/Social Interest | r=-0.242 (0.067) | | |
| ***Spiritual*** | | | |
| Seeking Spiritual Support | | | r=-0.296 (0.023) |

*HbA1c and biopsychosocial variables.* The biological variable of time since diagnosis was entered first. Next, the psychological variable of depression severity was entered into the second block. In step three, social variables of belonging/social interest and social/personal factors were entered into the regression. As shown in Table 3, the biopsychosocial model trended toward significant prediction of the variance in HbA1c (Adjusted $R^2$=0.10, p=0.06). The biopsychological model significantly explained 8% of the variance in HbA1c (Adjusted $R^2$=0.08, p=0.05). Although none of the biopsychosocial predictor variables made a significant individual contribution, years since diagnosis trended toward significance (β=0.24, p=0.07).

*Table 3.* HbA1c Regression Model

| **Model** | **R Square** | **Adjusted R Square** | **R Square Change** | **Sig. F Change** | **Model F** | **Model Sig.** | **Standardized β** | **Sig.** |
|---|---|---|---|---|---|---|---|---|
| **1** | 0.065 | 0.047 | 0.065 | 0.061 | 3.666 | 0.061 | | |
| Diagnosis | | | | | | | 0.254 | 0.061 |
| **2** | 0.11 | 0.076 | 0.045 | 0.111 | 3.206 | 0.049 | | |
| Diagnosis | | | | | | | 0.267 | 0.046 |
| PHQ-9 | | | | | | | 0.213 | 0.111 |
| **3** | 0.164 | 0.097 | 0.054 | 0.208 | 2.452 | 0.058 | | |
| Diagnosis | | | | | | | 0.241 | 0.072 |
| PHQ-9 | | | | | | | 0.032 | 0.85 |
| Social/Personal | | | | | | | 0.221 | 0.2 |
| BSI | | | | | | | -0.148 | 0.279 |

*BMI and biopsychosocial variables.* The demographic variable of disability status was entered first. In the second step, the biological variable of self-rated health was entered. Next, health distress was the psychological variable entered in the final block of the model. The demographic and biopsychosocial model significantly explained 27% of the variance in BMI (Adjusted $R^2$=0.27, p<0.001) as illustrated in Table 4. In this model, disability status (β=0.32, p=0.02) made a statistically significant individual contribution to the model and health distress (β=-0.24, p=0.07) showed a trend toward individual contribution.

*Table 4.* BMI Regression Model

| **Model** | **R Square** | **Adjusted R Square** | **R Square Change** | **Sig. F Change** | **Model F** | **Model Sig.** | **Standardized β** | **Sig.** |
|---|---|---|---|---|---|---|---|---|
| **1** | 0.225 | 0.211 | 0.225 | 0.000 | 16.243 | 0.000 | | |
| Disability | | | | | | | 0.474 | 0.000 |
| **2** | 0.251 | 0.224 | 0.026 | 0.173 | 9.206 | 0.000 | | |
| Disability | | | | | | | 0.41 | 0.002 |
| Self-Rated Health | | | | | | | -0.173 | 0.173 |
| **3** | 0.32 | 0.269 | 0.079 | 0.05 | 6.247 | 0.000 | | |
| Disability | | | | | | | 0.319 | 0.019 |
| Self-Rated Health | | | | | | | -0.128 | 0.312 |
| Health Distress | | | | | | | -0.239 | 0.073 |

*Depression (PHQ-9 scores) and biopsychosocial-spiritual variables.* The demographic variable of disability was entered first. Then, biological variables of HbA1c and self-rated health were entered in block 2. In the third step, psychological variables of positive attitude, negative attitude, helplessness, acceptance, perceived benefits, and health distress were entered. Social/personal factors was the social variable entered in step four. In the final step, seeking spiritual support was entered. As shown in Table 5, Model 5, which incorporated demographic, biological, psychological, social, and spiritual variables significantly predicted depression severity. In the final model, health distress (β=-0.34, p=0.01) and social/personal factors (β=-0.35, p=0.03) made individually statistical significant contributions to the model.

*Table 5.* Depression Regression Model

| Model | R Square | Adjusted R Square | R Square Change | Sig. F Change | Model F | Model Sig. | Standardized β | Sig. |
|---|---|---|---|---|---|---|---|---|
| **1** | 0.099 | 0.082 | 0.099 | 0.019 | 5.844 | 0.001 | | |
| Disability | | | | | | | 0.315 | 0.019 |
| **2** | 0.266 | 0.222 | 0.166 | 0.005 | 6.149 | 0.002 | | |
| Disability | | | | | | | 0.152 | 0.247 |
| Self-Rated Health | | | | | | | -0.399 | 0.003 |
| HbA1c | | | | | | | 0.207 | 0.093 |
| **3** | 0.566 | 0.480 | 0.301 | 0.000 | 6.531 | 0.000 | | |
| Disability | | | | | | | -0.101 | 0.394 |
| Self-Rated Health | | | | | | | -0.274 | 0.056 |
| HbA1c | | | | | | | 0.199 | 0.065 |
| Health Distress | | | | | | | -0.4 | 0.004 |
| Positive Attitude | | | | | | | -0.019 | 0.888 |
| Negative Attitude | | | | | | | 0.075 | 0.599 |
| Helplessness | | | | | | | 0.165 | 0.208 |
| Acceptance | | | | | | | -0.06 | 0.737 |
| Perceived Benefits | | | | | | | -0.145 | 0.332 |
| **4** | 0.611 | 0.522 | 0.044 | 0.03 | 6.904 | 0.000 | | |
| Disability | | | | | | | -0.042 | 0.72 |
| Self-Rated Health | | | | | | | -0.197 | 0.097 |
| HbA1c | | | | | | | 0.135 | 0.206 |
| Health Distress | | | | | | | -0.339 | 0.011 |
| Positive Attitude | | | | | | | 0.059 | 0. 667 |
| Negative Attitude | | | | | | | -0.04 | 0.784 |
| Helplessness | | | | | | | 0.102 | 0.425 |
| Acceptance | | | | | | | -0.063 | 0.717 |
| Perceived Benefits | | | | | | | -0.164 | 0.252 |
| Social/Personal | | | | | | | 0.341 | 0.03 |
| **5** | 0.614 | 0.516 | 0.004 | 0.529 | 6.228 | 0.000 | | |
| Disability | | | | | | | -0.04 | 0.732 |
| Self-Rated Health | | | | | | | -0.199 | 0.097 |
| HbA1c | | | | | | | 0.132 | 0.218 |
| Health Distress | | | | | | | -0.337 | 0.013 |

|  |  |  |
|---|---|---|
| Positive Attitude | 0.083 | 0.563 |
| Negative Attitude | -0.041 | 0.782 |
| Helplessness | 0.1 | 0.437 |
| Acceptance | -0.038 | 0.83 |
| Perceived Benefits | -0.166 | 0.251 |
| Social/Personal | 0.347 | 0.029 |
| Spiritual Support | -0.073 | 0. 529 |

## Discussion

The present study indicated there are significant associations between HbA1c, BMI, and depression severity and various demographic and biopsychosocial-spiritual factors in African American women. The nature and function of those predictor variables was also explored. Few, if any, have considered African American women with type 2 diabetes and the combination of biopsychosocial-spiritual factors that impacts their diabetes management, mental, and physical health. We provided a glance at the complicated nature of biopsychosocial-spiritual factors and their influence on type 2 diabetes and its correlates in African American women. This exploration added insight into the construction of a predictor model of type 2 diabetes outcomes in African American women.

Several factors associated with African American women who have type 2 diabetes were supported and highlighted in this study. Over 50% of participants reported some level of depression. High rates of depression in African American women diagnosed with or at risk for type 2 diabetes have been well-documented though the actual rates of depression in this population have not been consistently established (Black, 2002; deGroot et al., 2003; Wagner et al., 2009). Almost four out of five participants in this study were obese or morbidly obese which is consistent with obesity rates for African American women throughout the US (Department of Health and Human Services, 2008). A self-report of "fair" or "poor" health has been associated with at least a twofold increased risk of mortality in African American women (McGee, Liao, Cao, & Cooper, 1999) and over 15% of our participants reported “fair” or “poor.” Even after adjustment for comorbidities and socioeconomic status, researchers have demonstrated a significant relationship between self-reported health status and subsequent mortality. Self-rated health has been shown to predict number of yearly physician contacts and all-cause mortality regardless of age, sex, gender, and social status (McGee et al., 1999; Miilunpalo, Vuori, Pasanen, & Urponen, 1997).

No single variable, demographic or biopsychosocial-spiritual, was significantly associated with all of the independent variables (HbA1c, BMI, and PHQ-9). However, belonging/social interest was associated with HbA1c and PHQ-9. It is possible that BMI was not associated with felt belonging because overweight is more culturally accepted in the African American community (Liburd, 2003). BMI and PHQ-9 were both associated with disability status, self-rated health, and health distress. This may be due to the physical and mental effects of weight and depression severity whereas diabetes control (HbA1c) is less visible to individuals and their social contexts.

In accord with previous studies (Collins-McNeil, 2007; Husaini et al., 2004), depression levels impacted participants’ diabetes control. Increased depression severity was associated with increased HbA1c. Depression impacts health behaviors (compliance, physical activity, eating) and diabetes-related coping (Anderson, Freedland, Clouse, & Lustman, 2001). This has been supported specifically in studies of African American women (Collins-McNeil et al., 2007; Fisher, 2005; Wagner et al., 2007). Causal directionality has not been determined although data exists suggesting that depression onset antedates type 2 diabetes diagnoses by an average of almost 9 years (Anderson et al., 2001).

What is less understood is if and/or how depression and type 2 diabetes mutually influence and are influenced by other psychosocial variables such as family coping, relationship satisfaction, support, and belonging. Depression has been shown to impact diabetes attitudes (Evers et al., 2001) and willingness to seek spiritual support (Ferraro & Kelley-Moore, 2000) in African Americans with type 2 diabetes. Together, these effects may impact motivation and self-care in African American women with diabetes (Collins-McNeil et al., 2007).

Researchers have shown that belonging and social interest positively impact compliance in individuals with type 1 diabetes in predominantly Caucasian samples (Kern et al., 1996). In the present study, this measure of sense of belonging and desire to contribute towards others' well-being was inversely associated with HbA1c and depression severity. As sense of belonging increased in participants, their HbA1c levels and depression severity decreased. This could be due to compliance as evidenced in the aforementioned study. Increased belonging and social interest has also been associated with higher physical and mental health, psychosocial-spiritual support, and/or life satisfaction (Hagerty & Williams, 1999; Nikelly, 2005).

Acceptance of diabetes was significantly associated with less depression and diabetes helplessness was significantly associated with more depression in this population of African American women with type 2 diabetes. This is consistent with existing literature regarding the maladaptive function of helplessness and adaptive function of acceptance for long-term psychological health of individuals with chronic disease (Evers et al., 2001). Inconsistent with the existing literature, in this study there was a significant positive association with the perceived benefits of having diabetes and increased depression severity. Researchers' previous findings implicate perception of benefits of having an illness as an adaptive function for the long-term physical and psychological health of patients with chronic illness(es) (Evers et al., 2001). It is thought that perceiving additional benefits of stressful and uncontrollable conditions and confronting the losses faced in chronic illness positively impact psychological and physical health indicators (Affleck & Tennen, 1996; Affleck, Tennen, & Croog, 1987). The major perceived benefits most common to individuals with chronic illnesses include: changes in life priorities and personal goals, strengthened personal relationships, and positive personality changes (Park, 1997). It is possible that participants in this study who had more difficulty managing their diabetes found more benefits and character-building opportunities than those who were managing well. In other words, higher levels of time since diagnosis and disease progression, complications, and/or difficulties may have increased the likelihood and strength of new life goals, personal relationships, and personalities. Another potential explanation is possible secondary gain received from assuming the sick role (Katon, Kleinman, & Rosen, 1982). Higher depression levels in participants may have translated into personal benefits such as increased personal attention, exemption from normal roles (i.e. employment, housework, and caretaking duties), and increased attention in participants' healthcare relationships.

Attitudes about diabetes were associated with HbA1c. Participants with lower HbA1c levels had more positive attitudes toward their diabetes; and participants with higher HbA1c levels had more negative attitudes about diabetes. This is similar to findings in existing literature concerning diabetes attitudes in which African American women reported higher negative attitudes about their diabetes than African American men (Montague, 2002). In that study, men participated in more self-care associated with their diabetes management and positive attitudes toward diabetes were associated with higher self-care. However, diabetes outcomes were not reported. In a similar study assessing diabetes empowerment, positive attitudes were associated with greater levels of psychosocial self-efficacy (Anderson et al., 2001). To our knowledge, no studies to date have connected negative and positive attitudes toward diabetes to diabetes control outcomes. Conversely, these negative attitudes have been associated with poorer self-care; and self-care has been linked to worse diabetes morbidity and mortality in African American women (Becker et al., 2004; Black, 2002). It is possible that the high level of depression in the present study elevated participants' negative attitudes toward diabetes. For example, survey questions such as "I feel unhappy and depressed because of my diabetes," "I am afraid of my diabetes," and "I find it hard to do all the things I have to do for my diabetes" may have elicited higher agreement due to comorbid depression.

Health distress in individuals with chronic disease(s) has been positively associated with psychosocial distress, disordered eating, fear of hypoglycemia, short- and long-term diabetes complications, and HbA1c in women even after adjustment for age, diabetes duration, and general emotional distress (Polonsky et al., 1995). Psychoeducational self-management interventions have been shown to reduce levels of health distress (Lorig et al., 1999). Health distress was significantly correlated with BMI and PHQ-9 in the African American women with diabetes in our study. In the depression severity hierarchical regression, health distress was a significant individual predictor of depression throughout the model. This is most likely a bidirectional relationship and it is difficult to discern which occurs first – depression or health distress. It is also unclear from this analysis whether health distress precedes poor health outcomes or poor health outcomes increase health distress. This relationship is also most likely bidirectional. Regardless, health distress may impact functioning in African American women with diabetes especially when they are overwhelmed and feeling helpless about their lives, diabetes, and self-care responsibilities.

### *Limitations*

There are several limitations to this study. Primarily, the study included a convenience sample of a small number of participants. These participants were those willing to participate and respond to a very long survey. Women who participated may have been different from those who declined due to reasons such as time constraints, transportation issues, disinterest, and/or mistrust. Demography is another concern. Participants were all taken from a university-based teaching clinic in eastern NC. In addition, the relatively small sample size limited the statistical power of some of the statistical analyses. There are limitations of the cross-sectional, descriptive survey method in that results and their analyses can only generate estimates of causation or association (Bowling, 2002). Due to confounding variables, these estimates may or may not represent the true relationships among variables. Researchers utilizing descriptive studies cannot generate robust evidence regarding the direction of causal relationships. For example, disability status made a significant individual contribution to BMI. However, it is quite possible that BMI significantly impacts whether or not someone is on disability.

### *Conclusions*

Diabetes is a complex, chronic disease requiring comprehensive biopsychosocial-spiritual support and care. Based on these results, we argue that individual factors associated with diabetes management and outcomes cannot be addressed in isolation in African American women. It is important to address the additive influences of biological, psychological, social, and spiritual factors as they work synergistically to effect type 2 diabetes outcomes. Continued investigation into the multiplicative biopsychosocial-spiritual factors impacting physical and mental health could lead to better understanding, management, and outcomes of type 2 diabetes in African American women. Understanding the confluence of these psychosocial variables and the many others not in the scope of this study is crucial to changing the trajectory of morbidity and mortality in African American women with type 2 diabetes. Examination of these factors and their additive impact could potentially lead to improved interventions such as education and increased clinical attention to mental health issues as well as treatment and outcomes such as decreased nephropathy and depression rates.

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# Appendices

# APPENDIX A

1. IRB Application
2. IRB Approval Letter
3. Approved Informed Consent Document

## East Carolina University/Pitt County Memorial Hospital

## Institutional Approval for Research Form

This form must be completed for any biomedical research study that will be conducted at the Brody School of Medicine (BSOM) and/or Pitt County Memorial Hospital (PCMH). Each relevant service area listed below will document its institutional approval of the relevant study on this form. For more information or instructions related to this form, visit the UMCIRB website at http://www.ecu.edu/irb/.

**PI: Mark B. White**

**Title:** Culturally-Relevant Perspectives of African-American Women with Type 2 Diabetes

**UMCIRB:**

**Contact Name:** April M. Hames

**Contact Phone Number:** (252) 744-2609

**Contact Address:** 4404 Treetops Circle, Winterville, NC, 28590

**General**

1. How many patients are expected to be enrolled in the study at this site? 150

2. What is the anticipated duration of the study and the timeline for completion?

IRB Approval Date -June 1, 2009; Collect data within first 4 months (through September 2009), transcribe and analyze data (December 2009)

3. What is the anticipated start date of research project?

IRB Approval Date (June 2009)

**************************************************************************************************

**ECU/PCMH Special Medical Services (Endoscopy, Bronchoscopy, Respiratory, Urodynamics, Neurophysiology)**

**PCMH**

1. Does the project involve any of the following clinical service areas? For PCMH, call extension 847-4460 to discuss study impact. (Ginger Edwards)

☐ GI Endoscopy

☐ Bronchoscopy

☐ Respiratory

☐ Neurophysiology

☐ Urodynamics

*************************************************************************************

**Radiation Safety – David Rushing 744-2933**

1. Will ionizing radiation be used? (This includes x-rays, CT scans, angiograms, cardiac catheterizations and nuclear medicine scans.)

2. What are the type and frequency of tests using ionizing radiation, which are a part of the protocol?

3. List the tests using ionizing radiation, which are outside the normal standard of care.

☒ Not applicable because the study does not include services under this section

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## Radiology (PCMH)

1. Does this study involve any of services that will be performed in Radiology, if so please call Onna Briley at 7-5260 to discuss study impact.

*************************************************************************************

**PCMH Financial**

**Please note:** This section, as well as the Financial Services Review Form, must be completed if any clinical services will be performed as part of the study – even if all of those services will be paid for by the sponsor.

1. Confirm that the mechanism for direct billing has been established with the services required for the research study. If there has been no established mechanism contact the following:

Pharmacy—Tammy Worden – 847-5723

Radiology — Onna Briley – 847-5260

Laboratory—George Williams – 847-4946

Other Services —Billy Glidewell – 847-5615 or Sharon Sherwood – 847-6856

Investigational Device Service Codes – Marybeth Nagle – 847-6161

2. Contact Billy Glidewell at 847-5615 or Sharon Sherwood at 7-6856 to negotiate the price.

3. What is the turnaround time for payment of the claim?

4. Who is responsible for payment of the claims?

5. What is the billing address and contact person for claims payment?

Devices only:

Device Category____ Attach a copy of the FDA letter confirming the category.

☒ Not applicable because the study does not involve any clinical services to study subjects.

Note: The research participant list (enrollees) needs to be faxed to Sharon Sherwood at 847-0635

______________________________________________________________

**PCMH Financial services** **Date**

**************************************************************************************

**PCMH Materials Management**

Confirm that the mechanism for tracking investigational devices has been established with the services required for the research study. If there has been no established mechanism contact the following:

Materials Management–- Debbie Tetterton at 847-4236.

1. Describe how the investigational devices for this research will be ordered.
2. Describe how the investigational devices for this research will be received into the hospital.
3. Describe how and where the investigational devices for this research will be stored.
4. Identify who will have access to the investigational research devices and how access by unauthorized individuals will be prevented.

☒ Not applicable because the study does not include services under this section

______________________________________________________________

**Materials Management** **Date**

**************************************************************************************

BSOM Financial

**Please note:** This section, as well as the Financial Services Review Form, must be completed if any clinical services will be performed as part of the study – even if all of those services will be paid for by the sponsor.

1. Confirm that the mechanism for direct billing has been established with the services required for the research study. If there has been no established mechanism contact the following:

Pharmacy – Ruth Parish at 744-1830

Pathology – Edna Denton at 744-3748

Other – Frank Evans at 744-3108

2. What is the turnaround time for payment of the claim?

3. Who is responsible for payment of the claims?

4. What is the billing address and contact person for claims payment?

☒ Not applicable because the study does not involve any clinical services to study subjects.

**Note: The research participant list (enrollees) needs to be faxed to Linda Schwarz at 744-3679.**

**Note the following information:**

1. All claims will reflect the typical BSOM charge for service.

---

**BSOM Financial services** **Date**

**************************************************************************************

**PCMH Nursing Services**

**Contact: Dianne Marshburn at 847-4817**

1. Identify the target admission floors for the study patients (inpatients)

2. Identify any nursing outpatient department involved with the study. (AMU, ASU, CEU, APU, Healthsteps, Cath Lab, COU, EP Lab, etc).

3 Describe the extent in which the nursing staff will be involved in delivering, administering, or monitoring of the investigational test item.

4 Describe the staff education plans, if any, and attach any relevant educational materials.

5. Identify any consulting or support services that will be required specifically for the research study.

6. Describe the impact that the research study will have on length of stay.

7. Identify if there will be a potential increase in the length of time to perform any research related procedures.

☒ Not applicable because the study does not include services under this section

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**BSOM Clinical Operations**

1. How frequently will patients be seen?
one time

2. How long will an average visit take?
30 minutes

3. What are the specific locations where patients will be seen?
Family consult room in Family Medicine Clinic or in exam room while waiting on provider to enter for visit

4. What types of clinical staff will be involved in the care of the patients? (e.g. R.N.s, L.P.N.s, mid-level providers, physicians, etc.)

none

5. Describe the Staff Education plans, if any, and attach any relevant educational materials.

☐ Not applicable because the study does not include services under this section

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**BSOM Director of Nursing and Clinical Operations** **Date**

Martha Dartt (744-1276) darttm@ecu.edu

*************************************************************************************

**Rehabilitation Services – PCMH** **(**Rita Gillis – 847-7455)

1. Does the project involve any of the following Rehab disciplines/services:

| Inpatient | Outpatient |
|---|---|
| ☐Physical therapy | ☐Physical therapy |

| | |
|---|---|
| ☐Occupational Therapy | ☐Occupational Therapy |
| ☐Speech-Language Pathology | ☐Speech-Language Pathology |
| ☐Audiology | ☐Audiology |
| ☐Recreation Therapy | ☐Recreation Therapy |
| ☐Psychology | ☐Psychology |
| ☐Orthotics | ☐Orthotics |
| ☐Aquatic Therapy | ☐Aquatic Therapy |
| ☐EMG Lab | ☐EMG Lab |
| | ☐Vocational Rehabilitation |
| | ☐Physician Clinics (please specify) |

2. Will the research protocol be conducted during the patient's therapy times, which are held 7 days of the week between the hours of 8:00 and 4:00 pm.? There are strict standards from CMS regarding the number of therapy hours our patients must receive.

☒ Not applicable because the study does not include services under this section

_______________________________________________________________

**Rehabilitation Services** **Date**

Rita Gillis – 847-7455
*************************************************************************************

**PCMH Laboratory – (George Williams – 847-4946)**

1. Will there be any laboratory tests performed as part of this study that will not be billed to the patient's hospital account?

2. Will there be any specimens collected from the patient that will require testing or examination at an outside laboratory?

3. Does this study require the PCMH Microbiology laboratory to perform susceptibility studies on investigational drugs?

4. Will hospital pathologists or pathologist assistants be asked to collect or examine tissue specimens as part of this study?

5. Will stored tissue (block or slides) be examined as part of this study?

**Note the following information:**

1. The PCMH laboratory is prepared to support research by performing all tests that are part of our standard test menu.
2. The PCMH laboratory is not prepared to collect, prepare, store or transport specimens to central laboratories as part of this study.
3. Requests for laboratory testing performed at PCMH which are not a part of the patient's standard of care should be submitted on special forms obtained in the laboratory Outreach office from Vickie Radford at 847-4222.
4. Note that any individual mailing biological materials from the institution must have received the appropriate training and certification or its equivalent. For additional question call Benton Dow at 744-2237.

☒ Not applicable because the study does not include services under this section

**Laboratory services** **Date**

************************************************************************************

BSOM Pathology Department (Contact: Edna Denton 744-3748)

1. Will hospital pathologists or pathologist assistants be asked to collect or examine tissue specimens as part of this study?

2. If pathologist or pathology assistants will be asked to collect or examinee tissue specimens as part of the study, respond to the following questions:

a. Will the pathologist be required to select fresh tissue, tissue section, or tissue block to be sent for further study (specify)?

b. Will the pathologist be required to provide additional information and/or description of a gross specimen beyond that usually required for diagnosis (see http://www.cap.org/apps/docs/cancer_protocols/protocols_index.html for standard gross information provided)?

c. Will the pathologist be required to provide additional information and/or description of microscopic features of the specimen beyond that usually required for diagnosis (see http://www.cap.org/apps/docs/cancer_protocols/protocols_index.html for standard microscopic information provided)?

d. Have arrangements been made to reimburse the pathologist for services provided in relation to this clinical trial?

**Note the following information:**

1. The Pathology Department is prepared to support clinical trials research by providing professional services that are routinely required for specimen diagnosis.
2. Requests for professional services that are not a part of those routinely required for diagnosis, including selection of tissue, sections, or blocks, and gross and microscopic descriptions of specimens, should be fully described and submitted to Edna Denton at 744-3748.
3. Edna Denton can provide investigators with appropriate fee schedules to determine pathology costs related to clinical trials.

☒ Not applicable because the study does not include services under this section

____________________________________________________________

**Pathology Department** **Date**

**************************************************************************************

**PCMH Pharmacy (Tammy Worden – 847-5723)**

1. Are the drugs investigational?

2. Are the drugs FDA approved but being used for an unapproved indication?

3. Will the drugs be dispensed to the patient in the hospital, outpatient hospital department, or from a clinic or private office setting?

4. Are the drugs being charged to the patient or supplied free of charge by the sponsor?

5. Is there a contract with the Investigational Drug Pharmacist to receive, store and dispense the drugs under investigation?

☒ Not applicable because the study does not include services under this section

____________________________________________________________

**PCMH Pharmacy Services** **Date**

************************************************************************************

BSOM Pharmacy – Ruth Parrish 744-1830

1. Are the drugs investigational?

2. Are the drugs FDA approved but involve non-approved uses?

3. What is the charge for the medication to the patient?

4) Where will the study drugs be stored and will the drugs be labeled for each study patient?

5) Who will be accountable for the dispensing and documentation of study drugs?

☒ Not applicable because the study does not include services under this section

**BSOM Pharmacy services** **Date**

************************************************************************************

**PCMH Health Information Management Services (HIMS) & PCMH Privacy Officer**

**ECU HIPAA Privacy Officer**

1. Which of the following have been submitted for this study?

☒ HIPAA Authorization

☐Waiver of HIPAA Authorization (if a HIPAA waiver is used, you must provide PCMH or ECU Privacy Officer with accounting of disclosure list – call if questions)

☐Application for research on decedents

☒HIPAA Authorization has been incorporated into the research consent document

2. Will this study require (or has it already required) use or disclosure of protected health information for purposes related to preparing for the research study (e.g. recruiting participants, developing protocol, etc.) If so, contact Joann Kavuru at 744-5200 or Joy Hardee at 847-6545.

**Note the following information:**

1. Research access to medical records will be "view only".

2. The legal medical record for PCMH is the imaged medical record.

3. A researcher must have and maintain the appropriate UMCIRB and HIPAA approvals prior to requesting or accessing any protected health information from the hospital medical records system.

4. The researchers will follow all established ECU and PCMH policies for the conduct of research and use of protected health information.

☐ Not applicable because the study does not require use or disclosure of any patient information.

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**PCMH Health Information Management Services** **Date**

**Jean Foster, Administrator HIMS – 847-4249**

**Joy Hardee – UHS Privacy Officer 847-6545**

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**ECU HIPAA Privacy Officer** **Date**

**Joan A. Kavuru 744-5200**

**************************************************************************************

**<u>Principal Investigator Signature</u>**

**I affirm that the above information is correct. I agree to abide by the statements as noted under the PCMH medical records section. I confirm that a Clinical Trial Participant List will be provided to PCMH and ECU Patient/Clinical Financial Services with updates as new enrollees are added.**

______________________________________________________________

Principal Investigator Date

I have reviewed this Form, and all [BSOM] [PCMH] signatures have been obtained. Please note, however, that this is not a representation of the accuracy or appropriateness of each department's review and Institutional approval of this Study. Each department's approval is the sole responsibility of the relevant department representative.

_____________________________________________ PCMH

**Contact: Dianne Marshburn at 847-4817**

_____________________________________________BSOM

**Contact: Joan A. Kavuru at 744-5200**

E A S T
CAROLINA
UNIVERSITY

**University and Medical Center Institutional Review Board**
East Carolina University • Brody School of Medicine
600 Moye Boulevard • Old Health Sciences Library, Room 1L-09 • Greenville, NC 27834
Office 252-744-2914 • Fax 252-744-2284 • www.ecu.edu/irb
Chair and Director of Biomedical IRB: L. Wiley Nifong, MD
Chair and Director of Behavioral and Social Science IRB: Susan L. McCammon, PhD

TO: April Hermes, MM Ed, Department of Family Medicine, ECU

FROM: UMCIRB

DATE: May 27, 2009

RE: Expedited Category Research Study

TITLE: "Exploring the Psychosocial Aspects of African American Women with Type 2 Diabetes Mellitus in the Family Medicine Center"

**UMCIRB #09-0459**

This research study has undergone review and approval using expedited review on 5/19/09. This research study is eligible for review under an expedited category because it is research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.). The Chairperson (or designee) deemed this **Dept. of Family Medicine** sponsored study **no more than minimal risk** requiring a continuing review in **12 months**. Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

The above referenced research study has been given approval for the period of **5/19/09** to **5/18/10**. The approval includes the following items:

- Internal Processing Form (received 5/12/09)
- Type 2 Diabetes Survey
- Informed consent document

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

**The UMCIRB applies 45 CFR 46, Subparts A-D, to all research reviewed by the UMCIRB regardless of the funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies under the Food and Drug Administration regulation. The UMCIRB follows applicable International Conference on Harmonisation Good Clinical Practice guidelines.**

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418
IRB00004973 East Carolina U IRB #4 (Behavioral/SS Summer) IORG0000418
Version 3-5-07

UMCIRB #09-0459
Page 1 of 1

## Informed Consent Document

Title of Research Study: Exploring the Psychosocial Aspects of African American women with Type 2 Diabetes Mellitus in the Family Medicine Center
Principal Investigator: April M. Hames, MM Ed, Doctoral Candidate
Institution: East Carolina University
Address:150 Rivers Building, Greenville, NC, 27858-4313
Telephone #: (252) 737-2076

### INTRODUCTION

You have been asked to participate in a research study being conducted by a doctoral student at East Carolina University in the Medical Family Therapy Program. This research study is designed to explore the psychosocial aspects of disease management of type 2 diabetes in African American women.

### PLAN AND PROCEDURES

Participants will be asked to fill out a long survey assessing the experience of living with type 2 diabetes. After that, participants' charts may be reviewed and they may be contacted for a follow-up interview lasting no more than 10 minutes.

### POTENTIAL RISKS AND DISCOMFORTS

There are no phsyical, economic, legal, or dignitary risks. If participants experience emotional distress, they will be referred to therapy with a trained mental health professional. Any risk in this area is considered small. Participants will only discuss what they feel comfortable sharing.

### POTENTIAL BENEFITS

Participants will have the opportunity to process and describe the feelings associated with the experience of living with type 2 diabetes mellitus. Often, this alone is viewed as therapeutic.

### SUBJECT PRIVACY AND CONFIDENTIALITY OF RECORDS

Enrolled participants may withdraw from the study at any time. Existing data can be immediately destroyed upon request. All data will be kept in a locked office under the care of a research team member who will destroy it upon project completion. Names will be removed from collected patient data and recordings. A subject number will be assigned to help ensure confidentiality.

### COSTS OF PARTICIPATION

There is no cost associated with participation in this study.

Version date:
UMCIRB
APPROVED
FROM 5-19-09
TO 5-18-10

____________
Participant's initials

## COMPENSATION

There is no monetary compesation in return for study participation. Participants will receive a small compensation package with miscellaneous medical supplies for their participation.

## VOLUNTARY PARTICIPATION

Participating in this study is voluntary. If you decide not to be in this study after it has already started, you may stop at any time without losing benefits that you should normally receive. You may stop at any time you choose without penalty.

## PERSONS TO CONTACT WITH QUESTIONS

The investigators will be available to answer any questions concerning this research, now or in the future. You may contact the investigator, April M. Hames via phone at (252) 744-2609. If you have questions about your rights as a research subject, you may call the Chair of the University and Medical Center Institutional Review Board at phone number 252-744-2914 (days), the hospital Risk Management Office at 252-847-5246 and/or the ECU Brody School of Medicine Risk Management Office at 252-744-2380 (days) and/or the ECU Risk Management Office at 252-328-6858.

## CONSENT TO PARTICIPATE

**Title of research study:** Exploring the Psychosocial Aspects of African American Women with Type 2 Diabetes Mellitus in the Family Medicine Center.

I have read all of the above information, asked questions and have received satisfactory answers in areas I did not understand. (A copy of this signed and dated consent form will be given to the person signing this form as the participant or as the participant authorized representative.)

Participant's Name **(PRINT)** **Signature** **Date** **Time**

PERSON ADMINISTERING CONSENT: I have conducted the consent process and orally reviewed the contents of the consent document. I believe the participant understands the research.

Person Obtaining consent **(PRINT)** **Signature** **Date**

Principal Investigator's **(PRINT)** **Signature** **Date**

Version date:

UMCIRB
APPROVED
FROM 5-19-09
TO 5-18-10

Participant's initials

## UMCIRB HIPAA Privacy Authorization

The Brody School of Medicine (BSOM)/Pitt County Memorial Hospital (PCMH):
Research Participant Authorization to Use and Disclose Protected Health Information for Research

**For use only with the research consent form for: UMCIRB#:** 09-0459
**PI: April M. Hames, MM Ed, Doctoral Candidate**
**Title: Exploring the Psychosocial Aspects of African American Women with Type 2 Diabetes Mellitus in the Family Medicine Center**

When taking part in research, protected health information (PHI) is collected, used, and shared with others who are involved in the research. Federal laws require that researchers and health care providers protect your PHI. Also, federal laws require that we get your permission to use collected PHI for the research. This permission is called authorization.

In order to complete the research project in which you have decided to take part, we need to collect and use some of your PHI as described below.

### What types of protected health information (PHI) about me will be used or disclosed?

[☐] BSOM/PCMH Billing records

[☒] BSOM/PCMH Mental Health records

[☒] BSOM Physician/clinic records

[☐] Other:

[☐] PCMH medical records (in and out patient)

[☐] PCMH/BSOM lab, pathology and/or radiology results

[☐] PHI previously collected for research purposes

### Who will use or disclose my PHI?

[☒]Principal Investigator

[☒]Other members of the research team

[☐]Other providers involved in your care during research procedures, outpatient/inpatient stays during which research is being performed, or physician office visits during which research is being performed.

### Location where research will be conducted

The members of the research team will conduct the research study at:
☒ East Carolina University (ECU) ☐ PCMH ☐ ECU & PCMH ☐ Other

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FROM 5-19-09
TO no expiration

**Who will receive my PHI?**

[☐] Sponsor or other funding source to provide oversight for entire research project
[☒] Research investigators to conduct and oversee the research project
[☒] Research team members to participate in the various research activities
[☐] FDA or other regulatory agencies to provide regulatory oversight
[☐] UMCIRB to provide continuing review of the research project
[☐] Institutional officials in connection with duties for monitoring research activity
[☐] Researchers at other sites to participate in the research when more than one research site is involved
[☐] Other

We will share only the PHI listed above with the individuals/agencies listed above. If we need to share other PHI or if we need to send PHI to other individuals/agencies not listed above, we will ask for your permission in writing again

**How my PHI may be released to others:**

The BSOM and PCMH are required under law to protect your PHI. However, those individuals or agencies who receive your PHI may not be required by the Federal privacy laws to protect it and may share your PHI with others without your permission, if permitted by the laws governing them.

**What if I do not sign this form?**

You will not be eligible to participate in this study if you do not sign this Authorization form.

**How may I revoke (take back or withdraw) my authorization?**

You have the right to stop sharing your PHI. To revoke (or take back) your authorization, you must give the investigator your request to revoke (or take back) your authorization in writing. If you want us to stop collecting your PHI for the study, you may be removed from the study. If you are removed from the study it will not affect your ability to receive standard medical care or any other benefits for which you are entitled to receive. PHI collected for the research study prior to revoking (or taking back) your Authorization will continue to be used for the purposes of the research study. Also, the FDA (if involved with your study) can look at your PHI related to the study even if you withdraw this authorization.

**Restrictions on access to my PHI:**

You may not be able to see your PHI in your medical record related to this study until the study is complete. If it is necessary for your care, your PHI will be provided to you or your physician.

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FROM 5-19-09
TO no expiration

**How long may the PHI about me be used or disclosed for this study?**
Research information continues to be looked at after the study is finished so it is difficult to say when use of your PHI will stop. There is not an expiration date for this authorization to use and disclose your PHI for this study.

If you have questions about the sharing of PHI related to this research study, call the principal investigator Dr. Mark White, LMFT at phone number (252) 744-2607. Also, you may telephone the University and Medical Center Institutional Review Board at 252-744-2914. In addition, if you have concerns about confidentiality and privacy rights, you may phone the Privacy Officer at Pitt County Memorial Hospital at 252-847-6545 or the Privacy Officer at East Carolina University at 252-744-5200.

## Authorization

To authorize the use and disclosure of your PHI for this study in the way that has been described in this form, please sign below and date when you signed this form. A signed copy of this Authorization will be given to you for your records.

**Participant's Name (print)** **Signature** **Date**

**Authorized Representative Name (print)-----Relationship** **Signature** **Date**

**Person Obtaining Authorization** **Signature** **Date**

UMCIRB
APPROVED
FROM 5-19-09
TO no expiration

# APPENDIX B

1. Dissertation Proposal

# African American Women with Type 2 Diabetes:
# A Biopsychosocial Approach

April M. Hames

East Carolina University

# Introduction

Diabetes is a major clinical and public health problem in the United States. It is a common, chronic, incurable, systemic disease characterized by glucose intolerance or the body's inability to properly utilize glucose (Elders & Murphy, 2001). There are four basic categories of diabetes mellitus: type 1, typically diagnosed in childhood or early adulthood; type 2, usually diagnosed in middle or old age; gestational, diagnosed during pregnancy; and other, less common types that result from genetic defects, viral infections, drug/chemical use or other diseases (Black, 2002). Although diabetes is typically chronic and incurable, the disease can be controlled through the use of medications, diet, exercise, and other self-care strategies.

Type 2 diabetes is the most common form of diabetes accounting for about 90% of all diagnoses (DeCoster & Cummings, 2005). Most frequently considered a disease of middle and older age, type 2 diabetes typically occurs after age 40. In ethnic minority groups, the impact of type 2 diabetes, in terms of prevalence, quality of life, death, and disability, is greatly magnified (Elders & Murphy, 2001). After adjusting for population age differences, non-Hispanic African Americans are 1.8 times more likely to have diabetes than Caucasians (American Diabetes Association [ADA], 2006). Disparities in diabetes outcomes are predicted to worsen in the future: projected rates for diabetes diagnoses by the year 2020 indicate a 50% increase for African Americans as compared to a 27% increase for Caucasians. African Americans, especially African American women, with type 2 diabetes have consistently higher rates of end-stage renal disease (ESRD), neuropathy, retinopathy, blindness and non-traumatic lower-extremity amputations (Konen, Summerson, Bell, & Curtis, 1999).

Why differences in diabetes outcomes exist in ethnic minorities is less understood. Evidence is mixed concerning whether there are racial differences in diabetes processes of care across ethnicities (Heisler, Smith, Hayward, Krein, & Kerr, 2003). African Americans with diabetes have worse glycemic, lipid, and blood pressure control than other groups (e.g., Harris, Eastman, Cowie, Flegal, & Eberhardt, 1999; O'Meara et al., 2004; Saadine et al., 2002). Although African Americans have poorer symptom control, few researchers have demonstrated that they, specifically women in this ethnic group, receive less aggressive biomedical treatment (Chin, Zhang, & Merrell, 1998; Harris et al., 1999; Heisler et al., 2003). Racial differences in medication adherence and other self-management practices have been identified in the literature (Trinacty et al., 2007). However, researchers have suggested that targeting medication adherence alone is unlikely to reduce diabetes control in any population including African American women (Adams et al., 2008).

The individual aspects of type 2 diabetes (i.e., glycemic control, demographics, BMI, and/or medication adherence) do not solely explain the disparities in prevalence, morbidity, and mortality of this disease (ADA, 1999). According to Nichols, Hillier, Javor, and Brown (2000), "characteristics of disease, treatment, and the home environment [explain] …an astounding 94% of the variance" of blood glucose control (p. 273). Though African Americans with diabetes have more severe disease progression at the initiation of treatment, one cannot underestimate the "unmeasured biological, cultural, or environmental determinants" that may explicate the disparities in the management, progression, and outcomes of type 2 diabetes in this population (Adams et al., 2008, p. 919).

In women, diabetes typically has a more devastating impact and is more difficult to control (Black, 2002). Speculations for this tendency include lower average socioeconomic class, decreased access to timely/adequate healthcare, blood glucose level's negative impact on hormones, responsibility to maintain cultural practices, less physical activity, obesity, and/or gestational diabetes. African American women are at a significantly elevated risk for diabetes and its complications (Black, 2002; Hargreaves, Schlundt, & Buckowksi, 2002). Some identified risk factors particular to African American women include low socioeconomic status, obesity, less physical activity, depression, and increased risk of gestational diabetes.

Considered synergistically, these factors form a biopsychosocial hypothesis for contextually understanding the disparate health outcomes in African American women with type 2 diabetes. Those who take a biopsychosocial approach conjecture that biological, psychological, and social factors all contribute to human functioning and health (Engel, 1977). The biopsychosocial approach has been expanded to incorporate the metaphysical elements (i.e., spirituality) of individuals in context (Wright, Watson, & Bell, 1996). An organizing theory to contemplate when synergistically considering biopsychosocial-spiritual influences on type 2 diabetes management and outcomes in African American women is Adlerian Theory. According to Alfred Adler, “human nature is driven by values and goals and is evolving, dynamic, and self-organizing” (Nikelly, 2005, p. 330). Adlerian Theory posits that the driving dynamic of life is deeply internalized feelings of inferiority that motivate us to strive for feelings of adequacy and power (Broderick & Schrader, 1981). To resolve this conflict, humans typically follow one of two paths. They “flee into illness from which we dominate and manipulate those around us through weakness” (p. 7), or “engage those around using a more open struggle for power” (pp. 7-8).

Adler’s theory emphasizes that individuals are teleological, social beings with a primary goal of belonging (Adler, 1998/1927). He felt that the ultimate goal and striving of humankind was optimum health and wellness (Sweeney & Witmer, 1991). When taking into account the unique perspective of African American women, one should consider the impact of socioeconomic status (including educational attainment), psychosocial support, family dynamics, culture (including oppression and discrimination), and spirituality on their meaning making and coping with diabetes, its management, and outcomes.

## Statement of the Problem

Those with diabetes cannot be considered apart from their environment. The social contexts in which individuals with type 2 diabetes live impact self-management skills, tasks, and motivation. Self-care for those with type 2 diabetes predominantly occurs in the home environment where the family constitutes perhaps the most important social context within which illness presents and is managed (Scollan-Koliopoulos, 2004). This is important to consider because biological, psychosocial, and spiritual domains have been correlated with diabetes self-management and outcomes (Lesniak, Rudman, Rector, & Elkin, 2006; Polzer & Miles, 2007; see Weihs, Fisher, & Baird, 2002, for a review). Though a relationship between diabetes and these domains has been established, more research is necessary to understand the relationship among these spheres of influence and type 2 diabetes outcomes.

Disparities in management and outcomes of type 2 diabetes are significantly higher in African American women, yet very few researchers have focused specifically on the biopsychosocial-spiritual aspects of diabetes management in this population. This intricate relationship is crucial to understand so that providers can take into account the systemic implications of these factors in the management of type 2 diabetes with their female African American patients. A focus on the relational and cultural contexts of type 2 diabetes management in African American women may influence current treatment protocols and prevention efforts by establishing a better understanding of these multiplicative relationships and, ultimately, the importance of addressing them in the treatment and management of type 2 diabetes.

Many components of the complex biopsychosocial-spiritual aspects of type 2 diabetes management in African American women have been explored. There is some literature in which researchers support various biopsychosocial-spiritual factors that impact disease management and outcomes in type 2 diabetes management in African American women. These components, like cultural factors such as dietary choices, low SES, and mental health issues, individually explain some aspects of the health-related disparities that exist in this population. None of the individual components, however, fully explain the significant differences in prevalence, management, morbidity, and mortality associated with type 2 diabetes, especially in African American women. The systemic implications of collective biopsychosocial-spiritual factors related to type 2 diabetes rates, progression, and endpoints in African American women must be further explored in a way that specifically addresses the dearth of literature in the psychosocial realm as well as how these individual components work in a multiplicative way to influence and impact diabetes management and outcomes.

There is much about the complex interplay among biopsychosocial-spiritual factors related to type 2 diabetes management that is not understood. It is even less understood in African American women. In reality, there is likely an additive impact of the multifaceted biological, psychological, social, and spiritual factors inherent in diabetes management and health-related outcomes. What is not known about these factors is the degree to which they interact and impact African American women with type 2 diabetes. This necessitates further examination of these elements and their additive, multiplicative, and/or mediating effects in efforts to provide a model of understanding and recommendations that shape the approach to prevention and treatment as well as the care provided to these individuals and their support systems. While SES, psychosocial support, meaning making, culture, mental health, sex, gender, and spirituality all individually impact diabetes-related management and outcomes, the combination of these (and possibly additional) factors is powerful and not yet understood. Further research considering how these mediators may be targeted in a way that may impact the more static moderators of disease management and hence, diabetes outcomes, is warranted.

## Plan for Proposed Study

The purpose of this proposed study is to explore the psychosocial aspects of type 2 diabetes management in African American women. The goal of this exploration is to identify what factors, if any, are correlated with good diabetes-related health outcomes, psychosocial satisfaction, and/or personal adjustment to life with type 2 diabetes in African American women. Specifically, psychosocial measures will be used to assess levels of optimism, social interest, empowerment, encouragement, life satisfaction, and family obligations. These are areas of interest that may impact the biopsychosocial-spiritual aspects of diabetes management and outcomes in African American women with type 2 diabetes that have not been carefully explored.

## Review of Literature

### *Introduction*

This review of the literature is an exploration of the existing relevant literature concerning culturally-appropriate considerations of gender and ethnicity that may impact the biopsychosocial-spiritual aspects of diabetes management and outcomes in African American women with type 2 diabetes. Though the disparities in management and outcomes are significantly higher in African American women, very few studies have focused specifically on the biopsychosocial-spiritual aspects of diabetes management in African American women. This intricate relationship is crucial to understand so that providers can take into account the systemic implications of these factors in the management of type 2 diabetes within this patient population. A focus on the relational and cultural contexts of type 2 diabetes management in African American women may influence treatment and prevention by establishing the importance of addressing these multiplicative elements of type 2 diabetes care.

## *Literature Search Procedure*

The articles in this literature review were found in EBSCO specifically in: HostAlt HealthWatch, CINAHL Plus, MEDLINE, Nursing & Allied Health Collection: Comprehensive, PsycINFO, Medline, PubMed, and OVID. Search terms included “type 2 diabetes management,” “family intervention,” and “African American.” Initially, the search terms “women” and “female” were included, but the results were too narrow with either of those terms. Limiters were English language and human populations. There were no limiters related to publication dates. Search results were included if they considered biological and psychosocial or spiritual considerations of management and outcomes of diabetes. References from those articles were also sought, reviewed, and included if relevant. The categorical labels for ethnicity utilized by the author(s) of each article were included as written.

## *Literature Review*

### *Psychosocial Support*

Psychosocial support is an important factor directly and indirectly related to the management of type 2 diabetes. Researchers have suggested a link between psychosocial factors and adherence behaviors as well as several endocrine and autonomic pathways (e.g., de Wit et al., 2007; Hocking & Lochman, 2005; Karlsen, Idsoe, Hanestad, Murberg, & Bru, 2004; and Lewin et al., 2006). Within the search parameters for this review, there were no studies specifically of psychosocial support and African American women. However, the search results focused on the psychosocial context of diabetes management and health have been included in this section. Karlsen et al. (2004) conducted a cross-sectional study that examined the relationship between perceptions of support and psychological well-being in Norwegian adults (n=534) with diabetes. They found that perceived support affected psychological well-being directly, as well as indirectly via effects on type 2 diabetes-related coping. This model yielded the best fit of those tested. Perception of support from the family was significantly associated with diabetes-related coping. Non-supportive dimensions of family behavior were strongly, positively associated with emotional-oriented coping and self-blaming. Emotional-focused coping and self-blaming predicted impaired psychological well-being and the influence of support on psychological well-being was mediated by coping for those participants with type 2 diabetes. These data suggest that it is important to develop interventions that target and decrease negative family interactions and increase positive family interactions. Karlsen et al. (2004) also asserted that efforts to educate and/or involve family members in a supportive manner may be invaluable in helping adults cope with the challenges of diabetes-related problems. It is important to determine whether there are similar relationships between perceived emotional and social support and psychological wellbeing on type 2 diabetes-related coping in other populations such as African American women.

Westaway, Seager, Rheeder, and Van Zyl (2005) employed a principal components analysis to determine the underlying dimensions of social support and its effects on well-being and diabetes management of Black South Africans (n=263) in two outpatient clinics. They found that two social support factors accounted for 78.9% of the variance of general health and well-being: (a) socio-emotional support (emphasis on close caring relationships) and (b) tangible support (provision of assistance). Socio-emotional support included social companionship, affective support, and emotional support. Patients with lower levels of social support had poorer levels of general health and well-being than patients with higher levels of social support. After controlling for clinic location, patients with controlled blood pressure had significantly more socio-emotional and tangible support than patients with poor blood pressure control. Health and well-being were significantly related ($r = 0.34$, $p < 0.01$) in these African participants with type 2 diabetes. Well-being was significantly related to hemoglobin (HbA1c) results ($r = -0.15$, $p < 0.02$), suggesting that patients in good mental health had better metabolic control than patients in poor mental health. Socio-emotional support was significantly related to health and well-being ($r = 0.16$, $p < 0.003$), but tangible support only related to well-being ($r = 0.15$, $p < 0.01$). This suggests that socio-emotional support was more important for health and well-being than tangible support in this population. This study strengthened the concept of social support as a bidimensional determinant of health and well-being of patients with diabetes.

As previously stated, the family is the social context with the most immediate impact on disease management (Campbell & Patterson, 1995; Fisher, 2005). The amount of support an individual perceives from her family may impact health and the management of disease. In his study, Fisher (2005) argued for greater consistency among family assessment, theory, and intervention regarding family-based interventions in chronic disease, specifically type 2 diabetes. Fisher evaluated the associations between disease management behaviors and family characteristics among African Americans, Chinese Americans, European Americans, and Hispanics with type 2 diabetes (n=509) from community healthcare settings with no evidence of major diabetes complications. Though there was no variation in the association between family and disease management scales across the ethnic groups, how family and health dynamics were expressed and experienced varied significantly across these groups. Dimensions independently and most often associated with diabetes management across each ethnic groups included: inability to resolve diabetes-related problems within the family, pessimistic belief in the world as meaningful and manageable, tendency not do things often with family members, and general dissatisfaction with spouse/partner relations. Family risk indicators significantly associated with these diabetes management dimensions included: patient reports of high depressive affect, dissatisfaction with diabetes and its management, and poor glycemic control. Fisher asserted that family-based diabetes interventions should incorporate these family risk indicators as targets for interventions.

The effects of various ways of providing spousal support (active engagement, protective buffering, overprotection) on self-efficacy as well as physical and mental health in patients with diabetes (n=21) and asthma (n=36) – two diseases that impose a high demand on self-management routines – were examined by de Ridder, Schreurs, and Kuijer (2005). Though this study was conducted in the Netherlands, it is important to include it since the researchers showed a relationship between spousal support and health in diseases requiring intensive management routines. The researchers suggested that the impact of protective buffering depends on symptom levels at baseline. Significant effects of active engagement and overprotection were absent though there were significant associations between protective buffering and overprotection. There were no significant associations between gender and spousal support styles or self-efficacy, but female participants reported poorer physical health at baseline and follow-up as well as poor mental health at follow-up ($\beta=-0.41$, $p<0.05$). Female participants experienced worse physical health when their husbands hid their concerns. Patients who perceived that their spouses hid their worries and concerns experienced worse health nine months later ($\beta=0.53$, $p<0.05$), independent from whether or not the patients experienced a high symptom level at baseline. In this study, participants' well-being determined whether acts of protective buffering were viewed as supportive. In other words, when the participants with diabetes or asthma felt good they appeared to benefit from protective support, but when they felt poorly, they became insecure.

A common type 2 diabetes complication disproportionately represented in African Americans is end stage renal disease (ESRD). In a study by Kimmel et al. (2000), female patients with ESRD on hemodialysis showed decreased survival rates when they reported negativity in marital relationships. The same relationship was not true for males with ESRD. Turner-Musa and Leidner (1999) found that African American women with ESRD appeared more vulnerable than African American men to negative influences of family relationships. In this study (n=476), African American women who lived alone or with only a spouse were twice as likely ($p<0.01$) to have shortened survival rates in ESRD than those who lived with more household members such as extended kin and adult children. Family structure was not significantly associated with mortality in male patients in this study. Turner-Musa and Leidner suggest that these results, in the context of similar studies, suggest that women possibly have an additional stressor of prescribed family responsibilities and may lack the type and/or amount of support they need to manage illness and to meet family obligations.

### *Socioeconomic Status*

The socially and economically disadvantaged are at a higher risk for diabetes and its complications (Black, 2002). Lower socioeconomic status (SES) is associated with risk of developing diabetes and lower prognosis for compliance with treatment and achieving control of blood glucose (Bertera, 2003). African Americans are more likely to be of lower SES, and African American women share a disproportionate burden of poverty (de Groot, Auslander, Williams, Sherraden, & Haire-Joshu, 2003). In fact, they are three times more likely to live in poverty than Caucasian women. About 50% of all African American families are headed by single females; and 45% of those live in poverty. African American women living below the poverty line have been found to be at greater risk for type 2 diabetes than women with greater economic resources.

Poverty is associated with negative health outcomes, including depression (de Groot et al., 2003). de Groot et al. examined the relationships of social and economic resources to depression in a sample of 181 African American women at high risk for type 2 diabetes. They used the Conservation of Resources theory as a conceptual framework. This theory proposes that individuals with fewer resources are more vulnerable to loss that those with greater resources. Using multivariate logistic regression analyses, they found that nonworking status, lack of home ownership, low appraisal of one's economic situation, low self-esteem, and increased life events were significantly associated with depression. Their findings emphasize the multifaceted sources of stress in the lives of poor African American women.

Inequalities in health in African American women have been attributed to various mechanisms related to SES that may act as intermediate risk factors for diseases such as type 2 diabetes (Black, 2002). These factors include poor nutrition, increased rates of poor health behaviors (i.e., smoking, limited access to adequate healthcare, alcohol consumption); higher body mass index (BMI), low birth weights among offspring (LBWs) and higher rates of discrimination (Hussain, Claussen, Ramachandran, & Williams, 2006; Lynch, Kaplan, & Sherma, 1997; Robbins, Vaccarino, Zhang, & Kasl, 2001). Discrimination may impact health by contributing to elevated stress levels, suboptimal relationships with medical providers, differences in availability of health-promoting resources, and/or public policies favoring certain groups (Gold et al., 2006). In general, low SES African American women have a lifetime morbidity greater than that among low SES Caucasian women. It has been hypothesized that the compounded stressors of race-based and SES-based discrimination work together to create an even greater morbidity burden (Angel & Angel, 2006; Becker, Gates, & Newsom, 2004; Black, 2002; Colen, Geranimus, Bound, & James, 2006; Gold et al., 2006; Signorello et al., 2007).

Chronic poverty may lead individuals to develop a set of orientations and behaviors that are incompatible with social mobility and economic success as well as effective involvement with social organizations (Angel & Angel, 2006). Institutional racism and discrimination perpetuate poverty and its resultant individual-level health damage through unsafe and unhealthful environments, low education levels, inadequate medical care, and feelings of helplessness and hopelessness. Inescapable poverty leads to chronically high levels of physical and social stress that increase the risk for poor health and vitality. Poverty and deprivation can undermine an individual’s sense of control and rob individuals of the optimism needed for a healthy life. According to Angel and Angel, older poor women are exposed to more social disruption in their lives compared with more affluent individuals and these women’s lives are often punctuated by a series of negative life events that are difficult to manage. At the same time, they are exposed to elevated levels of stress and have fewer resources for coping with life’s hardships. Even after controlling for SES differences, older African Americans perceive more discrimination, personal rejection, and unfair treatment compared to Caucasians, and self-reported discrimination has been shown to increase reports of depressive symptoms. Among African Americans almost every aspect of social service delivery, education, and employment is influenced by race/ethnicity. Poverty, low educational levels, and other social disadvantages are the underlying causes of poor health generally, but these economic and social disadvantages are not randomly distributed throughout the population and are greatest among African American women.

In a study by Signorello et al. (2007), diabetes prevalence between African American (n=34,331) and Caucasian (n=9491) men and women of similar SES was compared. The multivariate analyses did not support major differences in diabetes rates among the two populations. They found that diabetes prevalence grew with age, increasing BMI, decreasing education, and decreasing income. There was a trend of type 2 diabetes prevalence rising with decreasing income. However, this trend did not hold true for African American women in this study. Signorello et al. suggest that this may be due to a social gradient related to chronic stress, fetal malnutrition, depression and other psychosocial factors, obesity, inactivity, and lack of access to preventive healthcare. This supports the idea that racial differences in diabetes prevalence cannot be solely explained by established risk factors such as SES.

Though about 20% of the general population has less than a high school education, 40% of those with diabetes do not (Black, 2002). Borrell, Dallo, and White (2006) conducted statistical analyses on data from African American, Caucasian, and Hispanic samples in the 1997-2002 National Health Interview Survey to examine the association between education and diabetes prevalence in US adults and whether this relationship differed by ethnicity. The sample used in this analysis was very large (N=187,233) and the authors stated that Black and Hispanic persons were oversampled to ensure reliable estimates for those groups. Educational attainment was inversely associated with diabetes prevalence among Caucasians, Hispanics, and women but not among African Americans. The overall prevalence of diabetes was associated with education, with the least educated exhibiting the highest prevalence (10.2%) and those with at least a bachelor’s degree the lowest (3.4%). This pattern was consistently observed for age, race/ethnicity, sex, marital status, country of birth, insurance, and region of residence. People aged 65-74, African Americans, those reporting being married or living with someone, and those having public health insurance coverage exhibited the highest prevalence of diabetes regardless of their education. Women with at least a high-school diploma or GED had a higher prevalence of diabetes than men with the same educational attainment. These researchers found an inverse association between education and the cumulative number of diabetes risk factors. However, there was no association between education and the prevalence of diabetes for African Americans.

Women in the lowest income category as well as those with the least education were approximately two times more likely to have diabetes than those with high income or educational attainment; the association was not significant for men. Among persons with high educational attainment, Mexican Americans and African Americans had a higher risk of cardiovascular disease than Caucasians. African Americans and Hispanics earned lower incomes for the same level of educational than Caucasians after adjustment for age and occupation. This was more significant for women receiving lower income returns regardless of their race/ethnicity. This research team suggests that education may have a different effect on diabetes health among different racial/ethnic groups based on this inverse relationship with diabetes prevalence among Caucasians, Hispanics, and some women but not among African Americans. In other words, educational attainment may be a predictor variable for diabetes prevalence but is not necessarily the only factor to consider as the same level of educational attainment yields differential pay (e.g., less in Blacks and Hispanics, and even less in women who are Black or Hispanic).

Limited access to appropriate healthcare is another factor related to lower SES. Ethnic minorities under age 65 in the U.S. are at least twice as likely to be uninsured as their Caucasian counterparts (Johnson & Smith, 2002). Individuals with some form of health insurance more frequently report the influence of physicians and health educational programs in self-care regimens for type 2 diabetes than those who are uninsured (Becker et al., 2004). The insured report more extensive, biomedically informed programs of self-care such as diet and exercise regimens and believe that physicians help tailor specific approaches to their diabetes management. In focus groups of uninsured rural African Americans with type 2 diabetes, participants reported a significant lack of continuity of care, and most indicated that diagnosis occurred at a late stage in their disease (Utz et al., 2006). The information from these focus groups parallels a recent report of the Institute of Medicine (IOM), which concluded that racial and ethnic minorities in the U.S. receive a lower quality of care than Caucasians (IOM, 2002). The IOM (2002) suggested that these disparities in quality of health care exist even after accounting for differential access to care.

Anderson-Loftin and Moneyham (2000) explored the issues, concerns, and needs of 22 low-income, southern African Americans with type 2 diabetes attending a small rural health clinic. Two focus groups of predominantly African American females (n=15) identified that learning to live with diabetes and becoming an able manager of diabetes-related symptoms were processes necessary to control symptoms and preserve some predictability in their lives. Participants reported that vicarious experiences with others (i.e., family and friends) who have diabetes were a main source of motivation to adhere to prescribed therapies such as diet and medication; and role models were a powerful, yet rare, source of learning. Those participants who reported some success at symptom management often were further motivated to make healthier choices due to increased confidence and predictability in their previously unpredictable daily lives as well as decreased anxiety. The participants expressed the need for appropriately supportive healthcare and social services. Many participants perceived a lack of empathy and culturally-sensitive social services related to their chronic poverty as barriers to good personal and professional healthcare delivery.

The findings of Anderson-Loftin and Moneyham (2000), when considered in the context of the preceding literature concerning African Americans, women, and type 2 diabetes, lend support to interventions based on caring, collaborative relationships through which clients can learn self-care, access healthcare and social services, as well as make lifestyle changes. Social support was of prime importance to participants. Without adequate education and support of significant others and peers with diabetes, participants reported that it was difficult to manage their diabetes and make lifestyle changes. Support from others with diabetes was a critical source of inspiration and hope to these participants. Other researchers have reported similar findings and recommendations (Utz et al., 2006). These findings and others are discussed elsewhere in this review within the contexts of psychosocial support, family dynamics, culture, and spirituality.

### *Culture*

Many common elements in African American culture are important aspects that may be considered in ideal diabetes management. In this review of literature, culture is defined as the customary beliefs, social forms, and material traits of a group (McGoldrick, Giordano, & Garcia-Preto, 2005). Some factors common in African American culture that may specifically impact the health of African American women with type 2 diabetes include diet and self-care practices (McGoldrick et al., 2005). The literature related to the diabetes and the cultural variables of diet and self-care in African Americans is reviewed below.

*Diet.* Eating patterns and habits are important contributory factors to African American women’s disproportionate obesity and many chronic diseases such as diabetes (Hargreaves et al., 2002). Though African Americans show considerable variability in how they approach planning, choosing, preparing, and eating food, there are numerous commonalities. The meaning of food is influenced by personal, cultural, and environmental contexts that place African American women at high risk for poor eating choices. In a study by Hargreaves et al. (2002), African American women (n=40) in focus groups provided evidence of attempts to eat ‘healthy’ that were overcome by traditions, social influences, habits, and price. These participants were recruited from the faculty and staff of local southern universities. They revealed a strong connection between food and social life and emphasized cost and availability of food as important logistical considerations. The women shared that when and where food is eaten is as important as what is being consumed. Reported barriers to healthy eating included: cost of special foods, poor taste of low fat foods, lack of family support, difficulty using the exchange system (lists of foods that can be exchanged for any other food on the same list) and reading food labels, and problems changing habitual patterns of behavior. The most frequent deciding factors for choosing food were convenience and time; snacking was a frequent activity. Taste, habits, health, cost, social occasions, and emotions were reported as important influences on eating behaviors. Both positive (e.g., interest, enthusiasm, boredom, laughter, empathy, action, or curiosity) and negative (e.g., apathy, grief, fear, hatred, shame, blame, regret, resentment, anger, or hostility) emotions evidenced a variable effect on the choice of when and what to eat. Contextual factors for eating included ubiquitous availability of fast foods, snacks, and convenience foods.

James (2004) conducted six focus groups with African Americans (19 women and 21 men) in central Florida concerning factors influencing food choices, dietary intake, and nutrition-related attitudes. The general perception communicated in these groups was that eating healthy means giving up part of their cultural heritage and conforming to dominant culture. These focus groups further supported the idea that African Americans tend to gather together with extended family and friends on a regular basis and food is usually a large part of those gatherings (Ahye, Devine, & Odoms-Young, 2006; Black, 2002; Scollan-Koliopoulos, O'Connell, & Walker, 2006). Women in this study said male partners and children were barriers to healthy eating and were concerned with the waste/cost of introducing new foods that may be rejected by their families. Participants stated friends and relatives usually are not supportive of dietary changes and identified several barriers to eating healthy including no sense of urgency, the social and cultural symbolism of certain foods, the poor taste of healthy foods, the expense of healthy foods, and lack of information about healthy choices. Implications from the analysis of themes from these focus groups were: African Americans still need information on basic nutrition topics such as serving sizes and reading food labels; programs and materials should specifically be developed for churches, neighborhood grocery stores, and local restaurants; women are good targets for educational programs because they are primarily responsible for food shopping and preparation; and nutrition educational programs should go beyond the individual and target both immediate and extended families.

In a grounded theory investigation, Ahye et al. (2006) sought to understand intergenerational family roles and food management strategies of African American women from a socio-ecological perspective. Purposively selected groups of three generation families of African American women from low- and moderate-income communities participated in the interviews (n=30). The investigators reported that family structure, marital status, and work roles were representative of the population of African American women in the United States. Responsibility, a feeling of duty to provide food and meals for family members (maternal role), social connection reflecting value for bringing family members together through food, caretaking of others in the family, reward for a lifetime of caring for others, and equal opportunities to use food and meals as shared commodities emerged as themes for managing food and nutrition. The authors of this grounded theory study highlighted the importance of family support and intergenerational linkages to meet various family needs, express family values, fit into changing family structures, and make use of family resources. These intergenerational linkages may impact African American women trying to balance Type 2 diabetes management with their familial responsibilities especially those related to food.  Grandmothers functioning as mothers in many African American families are one mechanism for the continuity of food cultures across generations, but it raises the issue of self-care for middle-aged and older African American women as these roles may limit their available time are resources needed for appropriate diabetes management. Most study participants viewed chronic diseases (such as hypertension and diabetes) as inevitable illnesses of old age (Ahye et al., 2006). Findings of this analysis compelled researchers to emphasize how culturally-appropriate nutrition and health messages as well as intervention strategies can fit into various family structures and systems.

*Self-care.* The risk of developing type 2 diabetes and its complications increases with body weight and sedentary lifestyle (Black, 2002). Ethnic minority adults demonstrate higher rates of inactivity and overweight than do non-Hispanic Whites. Obesity is also more common for women than men age 25 and older. The prevalence of obesity is 13% higher among African American women than African American men. One explanation for this is that African American women are more likely than Caucasian women to be physically inactive.

In a qualitative study, Becker et al. (2004) utilized focus groups to study the cultural basis of self-care practices of chronically ill African Americans (n=167). The most common illnesses were diabetes, asthma, and heart disease and approximately three-fourths of participants reported a high school education or less. The researchers emphasize that the concept of a “right” to self-care never materialized as a galvanizing issue for African Americans and that self-care practices continue “to be affected by the overriding struggle for survival in the face of racism and oppression” ( p. 2067). The “survival arsenal” for African Americans with chronic illness(es) like type 2 diabetes was family structure and organization based on a repository of specific cultural beliefs and health practices and a primary source of cultural meaning as survival and efforts to transcend adversity are core themes in African American history. African Americans in these focus groups reported preferring group affiliation (such as church) over individuality. The participants identified social support and advice, spirituality, and nonbiomedical healing traditions as the primary culturally-based factors central to development of self-care approaches regardless of SES. Several participants reported strengths related to information-seeking, self-management, and coping strategies of diabetes including seeking support from health professionals, the use of close-knit networks among kin, friends, and church groups often seen in rural communities.

In a similar study about the self-management of type 2 diabetes in rural African Americans, Utz et al. (2006) reported congruent findings to Becker et al. (2004). Utz and colleagues also described individual coping strategies such as calming techniques, prayer, and writing down problems as examples of resilience and strength among many of the participants learning to live with diabetes. In their sample, participants conveyed that emotional support was highly valued and came from a wide variety of sources such as parents, adult children, relatives, and friends. This view of self-care versus collective care is reinforced by the concept of important community-based factors such as social cohesion, neighborhood structures, and organizations in African American communities (Johnson & Smith, 2002).

*Gender/Sex.*

Diabetes prevalence is comparable across genders, but among women, the disease generally has a more devastating impact and is more difficult to control (Black, 2002). This factor is most striking among African American women. “It is thought that much of this difference … results from varying rates of obesity, physical activity, and hormone action” (Black, 2002, p. 546). African American women also have higher rates of gestational diabetes and this elevates future risk of type 2 diabetes. Certain sociocultural factors, such as the roles women play in the family as keepers of culture and multigenerational caregivers, are also important considerations (Black, 2002). African American women are at a substantially elevated risk for many other risk factors for diabetes including low socioeconomic status, obesity, inactivity, depression, and increased risk of gestational diabetes (Hargreaves et al., 2002).

Women to Women (WTW) is a research-based computer intervention for chronic illness management in rural women (Cudney, Sullivan, Winters, Paul, & Oriet, 2005). Participants (n=120) had a variety of chronic illnesses including cancer, diabetes, rheumatoid conditions, and multiple sclerosis. The women in this study identified: having an illness over which there was no control, feeling uncertain about the illness’ course, and difficulty maintaining positive outlook over the long-term as the most difficult things about living with a chronic illness. Stress was a common factor among the women and it was attributed to uncertainties about health, finances, and life in general that they were otherwise unable to express as well as a limited ability to meet many responsibilities in home and family. Not being taken seriously by healthcare providers regarding healthcare concerns was a significant issue for the women in this study who sensed they were not heard or believed because of their gender. The participants also reported difficulties relating to other people in their lives (family and/or friends), feelings of isolation, fears of being rejected by friends when mentioning illness difficulties, and misunderstandings among family members about the toll disease takes on energy levels. The most difficult times for these women were when family and friends began to show weariness and burnout as they tried to help. Important tasks faced by the participants in this study were coping with the anger, fear, frustration, and sadness of having a chronic illness. This study, which incorporated a computer-based support group, showed that women with a chronic illness would join and commit themselves to an online educational and support group. Interventions like WTW may be promising for those who have limited access to support groups.

Women newly diagnosed with type 2 diabetes expressed feelings of being “home alone” during their initial self-management experiences, in spite of requisite knowledge and skills after completing a state-of- the-art multidisciplinary diabetes educational program (Rayman & Ellison, 2004). According to a study by Rayman and Ellison (2004), personal engagement in new self-management processes resulted in strong emotional responses, self-blame, and negative characterizations. The women in this study (n=11) were recruited from a health center in the Midwest and extensively trained during a week-long diabetes education program taught by a multidisciplinary team, so lack of management knowledge was not an issue for them. The social context of the illness experience is an important part of learning intensive self-management. The women of this study who struggled with daily self-management blamed themselves, and created additional stressors from within. They could not relate their struggles (i.e., anger, hurt, frustration, and/or depression) to any aspect of their self-management and so did not believe they should call the clinic or rely on their health providers for help. Simply being emotional, in their eyes, was not a legitimate illness management issue. Yet these very intense feelings accounted for periods of “opting out” of self-management. Rayman and Ellison suggested that providers should normalize the process of intensive self-management, acknowledge patients’ strong feelings, help them anticipate changes in the way they feel about themselves as well as changes in their relationships with important others, and assist in making mental preparations for how they will approach obstacles while considering the conflicting demands within their social networks. The researchers suggested that diabetes groups in which exemplars of management share their experiences might be helpful as well as a “buddy system” that pairs a new-to-management person with an exemplar.

### *Family Dynamics*

The family is the social context with the most immediate impact on disease management (Campbell & Patterson, 1995; Fisher, 2005). It is a “unique setting with powerful continuing relationships that assume levels of complexity and organization that go beyond the individuals involved” (Weihs et al., 2002, p. 9). The individual diagnosed biologically has the chronic disease, but structures, beliefs, and practices in families have major affects on disease outcomes. For example, conflicted family relationships can interfere with regulation of emotion (Fiscella, Franks, & Shields, 1997; Levenson & Gottman, 1983) and impact behaviors related to chronic disease management (Weihs et al., 2002).

There is an established link between family functioning and the management and outcomes of type 1 diabetes in children. Researchers have provided strong support for the protective effects of patient-family-provider alliance, family recreational time, family emotional closeness, and effective parental coping with the management and outcomes of type 1 diabetes in children (see Weihs et al., 2002, for a review). However, much less is known about the influence of family relationships on disease outcomes in adults with type 2 diabetes.

Culture influences family involvement in health and illness (Johnson & Smith, 2002). Compared to Hispanics and Caucasians, African Americans are more likely to perceive family as protectors against physicians. This partially appears to be a vestige of distrust and the historical experiences with the formal healthcare system, experiences marked largely by disrespect, lack of access, disregard, and abuse. Using a national sample of 6,529 individuals age 60 and older with type 2 diabetes (collected in the Third National Health and Nutrition Examination Survey III [NHANES III]), Bertera (2003) examined diabetes awareness, diagnosis, and social support among Mexican Americans, African Americans, other Hispanics, and Caucasians living in the US. Mexican Americans and other Hispanics had the lowest levels of social support and group affiliation on four of five social support measures. African Americans reported the highest number of times per year attending club meetings and highest mean number of telephone calls per week with family and friends. They also reported high mean numbers of face-to-face visits with neighbors, friends, and relatives and attendance at church services. These cultural differences were explained by Bertera as reflecting the importance of creative, culturally-sensitive of social support that strengthen family and community sources of social support and affiliation by reducing social, family, and personal isolation.

Linkages between change in disease management and family characteristics over time suggest that family context merits attention in long-term diabetes management (Chesla et al., 2003). In a study of family predictors of disease management over one year in Latino and European American patients with type 2 diabetes (n=161), higher levels of unresolved family conflict predicted negative changes in some aspects of diabetes management over time across ethnic groups. Family organized cohesiveness (a measure of family structure and organization) did not predict change in diabetes management over time within ethnic groups. Family emotional tone, measured by unresolved conflict, was important in understanding diabetes management over time. Distinct family influences on disease management highlighted the importance of examining relationships within groups before making cross-group comparisons. Chesla et al. suggested that family factors, operating uniquely within ethnic groups, must be understood before culturally-appropriate interventions can be developed. In a complex chronic disease like type 2 diabetes, family context must be considered even within healthcare meetings that are time-limited. Family structure, emotional tone, and family world view may be domains with potential to affect diabetes management over time. Awareness of the patient and family world view may be an important dimension for assessment in long-term diabetes management. Living in a family that believes the larger world to be unmanageable or lacking order may undermine a patient's orientation to the details and emotional strains of diabetes management.

### *Mental Health*

Stress impairs glucose tolerance and therefore negatively influences glycemic control and may contribute to the development of co-morbid chronic health conditions in those with diabetes (Black, 2002). African Americans have higher rates of recurrent stress compared to Caucasians; they report lower levels of life satisfaction and happiness as well as higher levels of mistrust than Caucasians (Neighbors & Williams, 2001). Helping African Americans cope with and manage stress may be useful in their diabetes management.

Individuals with diabetes are twice as likely to be depressed (ADA, 2006). This mental health concern has been associated with increased risk for the development of type 2 diabetes (Eaton, Armenian, Gallo, Pratt, & Ford, 1996). Comorbidity of diabetes and depression has been linked to poor glycemic control, higher BMIs, decreased physical activity, as well as more diabetes-related end-organ complications and impaired function (Lin et al., 2004; O'Malley, Forrest, & Miranda, 2003). African American women have a higher lifetime rate of depression than Caucasian women and men (Neighbors & Williams, 2001). A growing body of research suggests that depression may play a role in noncompliant health-related behaviors. Systemically, depression and medication adherence are thought to mutually influence each other. Researchers have shown that less compliant patients have higher BMIs, lower self-efficacy, and higher depression rates. This is consistent with social-cognitive theory, cognitive models of depression, and literature on obesity and depression that consider cognitive, social, and emotional aspects of behavior in the context of behavioral change (Hocking & Lockman, 2005). Utilizing a holistic approach that encompasses the entire person, diabetes care can help improve diabetes management, related depression, and diabetes-related outcomes across ethnic groups (Robinson, Barnacle, Pretorius, & Paulman, 2004). The prevalence of mental health concerns in African American women with type 2 diabetes suggests that these mental health issues may impact physical and emotional well-being (Bertera, 2003). In fact, Rubin and Peyrot (1999) reviewed the published, English-language literature on self-perceived quality of life among adults with diabetes and concluded that having better glucose control was associated with better quality of life as measured by physical and social functioning. Similar results from Fisher (2005) who evaluated the associations between disease management behaviors and family characteristics among four ethnic groups with type 2 diabetes (n=509) suggested that high depressive affect was strongly associated with family risk indicators and effectiveness of diabetes-related interventions. Negative conflict resolution was associated with high depressive affect and was a risk indicator for poor disease management.

According to de Groot et al. (2003) in a study examining the relationships of social and economic resources to depression in African American women (n=181) depression may be a larger problem among African American women than SES-adjusted prevalence rates suggest. In the general population of African American women, higher rates of depression are also associated with obesity. These women, with additional economic and social stressors, may be at risk for longer periods of depressive symptoms. This raises questions about the impact depression may have on the development of diabetes for these women. Association of depression with economic and social resources was evaluated from baseline to 6-month follow-up and the depression trajectories indicate that these variables significantly contributed to the prediction of persistent depression over time. Decreased total income, lack of home ownership, poor appraisal of one's future finances, low self-esteem, and greater number of life events at baseline predicted sustained depression at follow-up. African American women with fewer resources may be at greater risk for continued resource loss and unable to buffer the impact of future losses. In this study, ethnicity moderated the relationship between depressive symptoms and the health-related quality of life aspects of physical and role-emotional functioning, bodily pain, vitality, and general health perceptions in people with type 2 diabetes.

O'Malley et al. (2003) examined the association between attributes of primary care providers and care for depression among low-income African American women via computer-assisted telephone interviews of women (n=1,202) residing in Washington, DC. The researchers found that physician-patient relationships focused on mutual respect were associated with greater rates of provider inquiry about and treatment for depression. The rates of inquiry about and treatment for depression were low even though 98% of depressed women reported at least one primary care visit in the previous year and 70.4% reported more than two. The women surveyed in this study indicated that care for depression is viewed as one aspect of the overall comprehensiveness of primary care practices. Although African American women may not seek primary care services because of depressive symptoms, they may raise mental health concerns during the course of visits made for other reasons if they feel respected. According to O'Malley et al. (2003) providers should not be concerned that asking these women about depressive symptoms will insult them.

Interventions to increase women's perceived self-confidence and support may contribute to positive type 2 diabetes health outcomes (Whittemore, Melkus, & Grey, 2005). In their pilot study of a nurse coaching intervention, Whittemore et al., (2005) found that women with type 2 diabetes (n=53) reported the most consistent predictor of metabolic control, dietary self-management, and diabetes-related distress was support and confidence in living with diabetes. In randomized controlled trials, family psychoeducation has consistently reduced depressive symptoms, emotional distress, and caregivers' burdens surrounding illness (see Campbell, 2003, for a review). Also, patients with diabetes have demonstrated statistically significant gains in glycemic control and improvement in depression when part of a family psychoeducational group on mood and glycemic control (Trozzolino, Thompson, Tansman, & Azen, 2003).

### *Spirituality*

Some ideas and beliefs related to spirituality have been shown to influence the management and outcomes of type 2 diabetes (Gavin & Wright, 2007). Spiritual practices may play an important role in self-care and in managing chronic illness (Utz et al., 2006). Historically, African American churches have played an important social and psychological role in the lives of their members. In fact, in the African American community, church is characterized as a healing resource (Becker et al., 2004). Healthcare professionals can help incorporate spirituality into healthcare by conveying an acceptance of spiritual practices and supporting patients who use these practices to help them cope with illness.

According to a review by Musgrave, Allen, and Allen (2002), the relationship between spirituality and health provides an important perspective for public health intervention. Taken together or separately, religiosity and spirituality provide a framework for making sense of the world and coping with life. Christian spirituality among African Americans tends not to be abstract but to be deeply rooted in relationships and the community. They are more likely than Caucasians to pray privately, practice religious rituals, attend religious services, and believe that the *Bible* is the word of God. Prayer, the *Bible*, and the church community are the resources religious African American women often use to meet their daily needs. African American women hold belief in God and prayer as health-protective behaviors and they are more likely to participate in institutional religious behaviors and activities than African American men. Positive relationships exist between belief in God, life satisfaction, and health-promoting attitudes. However, Musgrave et al. (2002) indicated that public health cannot use faith communities or the spirituality of individuals to its own end. They must be a partnership in which the central mission of faith is respected.

Lesniak et al. (2006) examined the relationships among psychological distress, stressful life events, and religiosity in African Americans (n=215). Though stressful life events and religiosity levels did not differ by gender, females (n=156) reported greater levels of distress in each category. Intrinsic religiosity, or the private and emotional aspects of religiosity, was inversely related to both total distress and depression suggesting beliefs may supply a framework that restructures cognitions in a way that could be ultimately protective and/or beneficial to mental health and therefore, physical health. Organizational religiosity was inversely related to somatization and obsessive-compulsiveness suggesting that church attendance may play an important social or affiliative and religious role and therefore may be an important resource in moderating distress as a result of both roles of church attendance. Non-organizational religiosity was inversely related to interpersonal sensitivity suggesting that augmentation in relationships with the Divine may decrease the experience of interpersonal sensitivity in relationships with others. The implications from this study are that any interventions using religiosity as a tool must consider that the varied aspects of religiosity appear to have differing benefits that are only beginning to be understood.

Health perceptions, beliefs and attitudes, intentions, and social pressures that influence health promoting behaviors as expressed by community level aggregates of African American women with faith support were documented in a study by Drayton-Brooks and White (2004). They found that health beliefs, attitudes, and behaviors are not developed outside of social systems, and therefore, the facilitation of healthy lifestyle behaviors may be best assessed and influenced within a context of reciprocal social interaction such as in a faith-based community. The 26 African American women in focus group interviews expressed concerns that too often health educators desire to teach communities but fail to determine what groups already know or even wanted to know and why people act the way they do. Health concerns related to hypertension, heart disease, obesity, diabetes, and arthritis were emphasized by the participants. The women expressed the need for a healthy lifestyle, yet they expressed difficulty with translating knowledge into actual behaviors. Reported factors that helped these women engage in healthy lifestyles included prayer, relationships with others, pastoral support, feeling included and accepted, and trusting the healthcare provider. Discomfort with unfamiliar people, not feeling inclusion in groups, being alone, and living alone were reported as barriers to health-promoting lifestyles. Social pressures to eat unhealthily included generously proportioned, high-fat meals at church and the pressure to eat food served by other church members. Culturally, to avoid eating what was prepared at the church could be interpreted as not trusting the food preparation of another member. Limited commitment to behavioral change, interpersonal relationships, stressful lifestyles, and personal preferences were the leading subjective norms. Participants stated they were more likely to come into a church environment for health promotional programs due to the comfort of congregational support. This was also supported in an aforementioned study by Rayman and Ellison (2004). Greater emphasis on the environmental context of and the sociocultural influences on health-related behaviors was indicated by the women in this study. In the faith-based community, they seemed to find the inclusion, acceptance, open communication, friendship, and inspiration they need for healing and health promotion. Social support within faith communities appears to intercede with specific mediators of health.

In a study of spirituality in African Americans with diabetes, Polzer and Miles (2007) developed a theoretical model for how spirituality affects individuals' self-management of diabetes. Three typologies of spirituality emerged: (1) relationship and responsibility – God is in background; (2) relationship and responsibility – God is in the forefront; and (3) relationship and relinquishing of self-management – God is healer. Each typology reflects the conceptualization of African American spirituality as relational but not universal in its interpretation. Spirituality provided support to African Americans in dealing with chronic illnesses such as diabetes, yet the process of spirituality and self-management may not be same for all. The authors ultimately suggested that a community participant model could be used in conjunction with African American churches whereby the community itself could plan and become involved in such interventions. This could further promote and establish trust between African American patients and their healthcare providers.

Tanyi and Werner (2007) compared the spiritual well-being scores of African American (n=31) and Caucasian (n=27) women on hemodialysis for ESRD. There was a strong trend for these African American participants to score higher on religious well-being than Caucasian participants. Areas of spiritual strength for African American women in the study included perceptions of God’s concern for them, God’s help with loneliness, fulfilling relationships with God, satisfaction with life, and a sense of purpose. They relied on religion more for coping than Caucasian women. Relationships with God were highly important for the African American women in this study. They reported seeking God’s guidance, closeness, and support in their daily lives to manage health problems. Existentially, in this study African American women were found to be more satisfied with their lives, and expressed a stronger sense of future direction and purpose in life, when compared to the Caucasian women in this sample. These authors suggest that healthcare providers should encourage healthy religious participation and involvement in faith-based communities as these can be powerful avenues for the expression of spirituality.

### *Meaning Making*

When first diagnosed with diabetes, individuals often have already received diabetes education from a source they trust, a close relative (Scollan-Koliopoulos, O’Connell, & Walker, 2006) Thus, family may represent the primary influencing social network for performance of health behaviors (Savoca, Miller, & Quandt, 2004). A report by Scollan-Koliopoulos and colleagues (2006) on the psychometric properties of an instrument developed to assess recollections about family members with diabetes in a population of those who also have type 2 diabetes (n=123) suggested that individuals make sense of their chronic illness in the context of their life and its history. In this study, 24.2% of respondents disclosed their ethnicity as African American or Black while 61.7% reported that they were Caucasian. A principal components factor analysis was conducted and revealed that in the context of multigenerational legacies of diabetes, individuals learn how to care for their diabetes through family members with diabetes. Social consequences of diabetes explained 22% of the variance in this model of how individuals with a family history of diabetes make sense of their illness and its course. Most participants spoke of a grandparent or parent diagnosed with diabetes and could report the type, illness representations, and complications experienced.

African Americans with type 2 diabetes vary greatly in knowledge and ability to self-manage (Utz et al., 2006). Researchers support the inherent value of the group approach to diabetes education in this population. In focus groups of rural African Americans with type 2 diabetes, participants (n=73, 57% female) learned about diabetes management not only from health professionals but also from each other in ways that enhanced their openness and feeling of support (Utz et al., 2006).

The concept of making sense of diabetes within the family is supported in a study by Baptiste-Roberts et al. (2007). They examined the specific role that family history plays among African Americans in terms of their awareness of diabetes risk factors and engagement in protective health behaviors. The study was a cross-sectional analysis of African American adults (n=1122, 68% female) without diabetes who were participants in Project DIRECT (Diabetes Interventions Reaching and Educating Communities Together). Women were more likely than men to report a family history of diabetes and those with a family history of diabetes were more likely to rate their health as fair or poor, be overweight, and be aware of the risk factors of diabetes assessed within this study. Having a family history of diabetes was associated with better awareness of diabetes risk factors, more daily consumption of fruits and vegetables, and participation in diabetes screening. Women were more likely than men to report on female relatives with diabetes and were slightly more likely to regard family history as important to their own health and to collect family medical information. Baptiste et al. suggest that family history of diabetes is an indication of perceived susceptibility that provides a cue to action for behavioral change in the studied population.

### *Discussion*

It is clear from this review of literature that more than medical concerns and the quality of medical care affect outcomes for individuals with type 2 diabetes and that more research exploring these additional concerns is needed. Factors such as SES, psychosocial support, meaning making, culture, gender, mental health, and spirituality along with their sequelae all impact and are associated with diabetes self-management and outcomes. However, individually, none completely describe the disparate care and outcomes of African American women with type 2 diabetes. These multiple factors are evidence for the need to consider the whole biopsychosocial-spiritual context of care.

The literature reviewed here demonstrates that these factors, in combination, are unique in African American women. African American women face a significantly higher burden of type 2 diabetes as well as a higher rate of undesirable diabetes-related outcomes. Though type 2 diabetes is a biomedical disease, the discrepancies in diagnoses and outcomes cannot be solely explained by biological factors or differences in access and adherence to healthcare (Heisler et al., 2003). An intricate biopsychosocial-spiritual relationship exists that must be further explored and understood to help eliminate these health disparities in African American women with type 2 diabetes. The biopsychosocial-spiritual context of care must be synergistically considered in efforts to better understand and reduce the disparities in type 2 diabetes management and outcomes in African American women.

Many components of the complex biopsychosocial-spiritual aspects of type 2 diabetes management in African American women have been explored. There is some literature supporting various biopsychosocial-spiritual factors that impact disease management and outcomes in type 2 diabetes management in African American women. These components, like cultural factors such as dietary choices, low SES, and mental health issues, individually explain some aspects of the health-related disparities that exist in this population. Figure 1 depicts a model describing various factors that influence type 2 diabetes disease management and outcomes in African American women. These were all elements of influence that were addressed in this literature review. The figure has diabetes management and outcomes in African American women as the central component. From that core, biomedical, psychosocial, and spiritual influences are broken down into the individual components addressed in this review. None of the individual components fully explain the significant differences in prevalence, management, morbidity, and mortality associated with type 2 diabetes, especially in African American women. The systemic implications of the collective biopsychosocial-spiritual factors related to type 2 diabetes in African American women must be further explored in a way that specifically addresses the dearth of literature in the psychosocial realm as well as how these individual components work in a synergistic way to influence and impact diabetes management and outcomes.

There is much about the complex interplay among biopsychosocial-spiritual factors related to type 2 diabetes management that is not understood. These issues are even less understood in African American women. In reality, there is likely an additive impact of the multifaceted biological, psychological, social, and spiritual factors inherent in diabetes management and health-related outcomes. While SES, psychosocial support, meaning making, culture, mental health, sex, gender, and spirituality all individually impact diabetes-related management and outcomes, the combination of these (and possibly additional) factors is powerful and not yet understood. Further research considering how these mediators may be targeted in a way that may impact the more static moderators of disease management and hence, diabetes outcomes, is warranted. In order to impact these outcomes and decrease healthcare disparities in African American females with type 2 diabetes, new interventions and approaches incorporating the model depicted in Figure 1 must be designed and tested to account for these factors in some way.

Adlerian Theory, or Individual Psychology, is a possible framework with which to organize this complex, multiplicative factorial. Alfred Adler considered optimal health and wellness as the ultimate goal of humans (McCarthy & Tortorice, 2005). Prevention and health, according to Adlerian Theory, are a result of “the interconnectedness of life tasks, family bonds, sense of community, religion, education, government, media, industry, and global events” (McCarthy & Tortorice, 2005, p. 305). Adler posited that health and well-being are affected by cultural, historical, and world circumstances and events; however, this impact is not so much the results of these circumstances and events as it is how we interpret and give meaning to what happens (Sweeney & Witmer, 1991).When taking into account the unique interpretation and perspective of African American women, it is important to consider the impact of socioeconomic status (and educational attainment), psychosocial support, family dynamics, culture (including oppression and discrimination), and spirituality on their meaning making, coping, and resultant diabetes management.

In the future, researchers and clinicians should focus on what interventions simultaneously improve health outcomes and quality of life in this population while also exploring connections among these biopsychosocial-spiritual components of illness as well as whether some are better predictors and mediators than others. This exploration must include investigating and incorporating the strengths unique to African American women.

African American women need interventions designed specifically to address their unique experiences with health and type 2 diabetes. The literature reviewed here supports the concept that while the various biopsychosocial-spiritual factors discussed impact all individuals with type 2 diabetes, their impacts are different based on the individual and their culture, ethnicity, and gender. Therefore, in order to address the disparities in type 2 diabetes that exist with African American women, more in-depth investigation into the biopsychosocial-spiritual factors that impact type 2 diabetes care in this population need to be implemented; more new interventions based on this research need to be developed; and research testing the efficacy of these interventions is required.

## Method

This study will be a cross-sectional survey examination of African American women with type 2 diabetes. The aim of this exploration is to better understand the multiplicative influence of biopsychosocial-spiritual factors and their relationship to clinical outcomes of diabetes management. The Diabetes Survey (see Appendix A), a collection of surveys designed to address various biopsychosocial-spiritual aspects of health will be given to each participant. Responses will be correlated to biomarkers of diabetes management found in the electronic medical records (EMRs) of participants upon chart review.

The primary research aim is to examine the relationship between specific psychosocial variables and type 2 diabetes control in African American women. These psychosocial variables include: demographic information, perceived control, psychosocial support and self-efficacy, attitude toward diabetes, self-care, treatment compliance, barriers to care, family functioning, illness cognitions, health distress, life satisfaction, mental health, and personality. The main outcome measure of type 2 diabetes control is HbA1c > 7 vs. HbA1c < 7 as suggested by the American Diabetes Association (ADA, 1999). Secondary research objectives include exploring the relationship between additional biomarkers associated with type 2 diabetes outcomes (cholesterol, blood pressure, and BMI) and the abovementioned psychosocial variables as well as examining how personality variables are related to type 2 diabetes control in African American women.

### *Survey Method*

One method of collecting information from a population sample involves the use of survey(s). Survey research "studies large and small populations by selecting and studying samples chosen from the population to discover the relative incidence, distribution, and interrelations of sociological and psychological variables" (Kerlinger, 1986, p. 378). Descriptive surveys are those designed to measure certain phenomena in a target population (Bowling, 2002). These surveys facilitate the investigation of causal associations between variables. Surveys have two primary objectives: estimation of specific population parameters and calculation of statistical hypotheses of those specific populations.

There are limitations of the cross-sectional, descriptive survey method. Survey results and their analyses can only generate estimates of causation or association (Bowling, 2002). Due to confounding variables, these estimates may or may not represent the true relationships among variables. Researchers utilizing descriptive studies cannot generate robust evidence regarding the direction of causal relationships.

In this study, the cross-sectional self-administered survey is the data collection method of choice. Its greatest strength for this exploration is the ability to obtain large amounts of data from a sample of participants in a relatively short amount of time. This method is also a cost-effective means of gathering data. The self-administered survey can gather data directly from the population of interest in this research. African American women are the only individuals who can truly and accurately answer these questions related to their beliefs, support systems, family organization, satisfaction with life, etc. At this time, it is important to survey this population of interest regarding potential associations as little is known about these relationships in African American women with type 2 diabetes. The results of this research may increase efforts to establish associations for further study into type 2 diabetes management in African American women.

### *Measures*

Several surveys and questionnaires were compiled to provide a comprehensive inventory of demographic information, diabetes knowledge and acceptance, self-care, psychological adjustment, and  social support. See Appendix A for the complete survey instrument.

*Diabetes Care Profile.* The Diabetes Care Profile (DCP) is a survey regularly utilized by researchers to assess diabetes-related quality of life (Yanover & Sacco, 2008). The instrument has 234 items in seven sections. These sections include: control, social and personal factors, positive attitude, negative attitude, self-care ability, importance of care, self-care adherence, diet adherence, medical barriers, exercise barriers, monitoring barriers, understanding management practice, long-term care benefits, support needs, support, and support attitudes (Achhab, Nejjari, Chikri, & Lyoussi, 2008). The DCP is designed to assess the psychosocial factors related to diabetes (Fitzgerald et al., 1996). General demographics are also collected with the DCP. The DCP scales show adequate long-term test-retest reliability (between 0.38 - 0.48). Researchers have demonstrated internal consistency in the social support scales. The questionnaire is derived from the Health Belief Model (HBM). The HBM is an attempt to explain and predict health-related behaviors from individuals' beliefs in their self-efficacy related to those behaviors (Rosenstock, 1990). Therefore, issues associated with diabetes knowledge, treatment, and beliefs are assessed. Cronbach's alpha for this survey has ranged from 0.54 - 0.97. In a study examining the influence of treatment modality and ethnicity on attitudes in type 2 diabetes, researchers utilized the DCP and demonstrated that ethnicity has no impact on scores (Fitzgerald et al., 2000). Upon a systematic review of health-related quality of life measures in patients with diabetes, Achhab et al. (2008) recommend the DCP in research evaluating broad conceptualizations of diabetes-specific quality of life.

*Diabetes Empowerment Scale-Short Form.* The Diabetes Empowerment Scale-SF (DES-SF) is an 8-item short form derived from the original 37 item scale developed to measure the psychosocial self-efficacy in people with diabetes (Anderson, Fitzgerald, Gruppen, Funnel, & Oh, 2003). To allow for a brief overall evaluation of diabetes-related psychosocial self-efficacy, the eight DES-SF items represent the conceptual dimension of the original scale. These dimensions include: need for change, developing a plan, overcoming barriers, asking for support, supporting oneself, coping with emotion, motivating oneself, and making appropriate diabetes care choices (Anderson, Funell, Fitzgerald, & Marrero, 2000). The internal consistency reliability of the DES-SF using the original dataset was measured as $\alpha = 0.84$ (Anderson et al., 2003). In subsequent measures with a new sample, the reliability was consistent ($\alpha = 0.84$).

*Patient Health Questionnaire.* The Patient Health Questionnaire (PHQ) is a self-administered diagnostic measure of common mental disorders (Kroenke, Spitzer, & Williams, 2001). The PHQ-9 is the depression module that evaluates each of the 9 DSM-IV criteria for depression. This instrument is a reliable (Cronbach's α = 0.89) (Kroenke et al., 2001) and valid (with BDI r=0.73, with GHQ=0.59) measure of depression severity (Martin, Rief, Klaiberg, Braehler, 2006).

*Family Crisis Oriented Personal Evaluation Scales.* The Family Crisis Oriented Personal Evaluation Scales (F-COPES) was developed to identify problem-solving and behavioral strategies that families use in problematic and/or difficult situations (McCubbin, Olson, & Larsen, 1981). The F-COPES draws on the two levels of interaction outlined in the Resiliency Model: family to social environment (how families externally handle problems and difficulties between members) and individual to family system (how families internally handle problems and difficulties between members) (McCubbin, Thompson & McCubbin, 1996). The factors used to evaluate these levels of interaction in the F-COPES are how families and individuals acquire social support, reframe, seek spiritual support, mobilize family to acquire/accept help, and utilize passive appraisal. The overall reliability for the F-COPES is between 0.86 - 0.87 (Cronbach's α). Validity and test-retest reliability is adequate though reframing and passive appraisal show slightly lower test-retest scores in comparison with the other factors. This suggests that more specific psychosocial items like solicitation of social support provide more response consistency over time than those factors relating to more cognitive modification (McCubbin et al., 1996).

*Illness Cognition Questionnaire.* The Illness Cognition Questionnaire (ICQ) is a self-report instrument developed to assess three generic illness cognitions indicating different ways of re-evaluating meanings across different chronic diseases (Evers et al., 2001). The generic cognitions are “helplessness as a way of emphasizing the aversive meaning…, acceptance as a way to diminish the aversive meaning, and perceived benefits as a way of adding a positive meaning…” (p. 1026). The ICQ is designed to evaluate the maladaptive function of helplessness and the adaptive function of acceptance and perceived benefits for the long-term psychological and physical health of patients with a chronic disease. The ICQ authors conducted preliminary research which indicated adequate internal consistencies for all scales, ranging from 0.84 - 0.91 (Cronbach’s α) in various samples. Correlation coefficients between several various measurement points indicated high test-retest reliability (all above 0.67). Reliability and validity has been established across several chronic diseases including multiple sclerosis and rheumatoid arthritis (Cronbach’s α =0.87 - 0.89) (Wollaars, Post, van Asbeck, Floris, & Brand, 2007) as well as cerebral palsy, chronic fatigue syndrome and fibromyalgia (Herlinde, Geert, & Evers, 2007; Logie, Crombez, & Evers, 2007). Though the ICQ has not been studied specifically in African American women with type 2 diabetes, it was designed as a generic tool to assess maladaptive and adaptive functions of illness cognition across chronic diseases.

*Health Distress Scale.* The Health Distress Scale (HDS) is a subset of four questions from the Multiple Sclerosis Quality of Life (MSQOL)-54 instrument. The MSQOL-54 was designed to assess self-reported psychosocial consequences of multiple sclerosis (MS) (Solari, Ferrari, & Radice, 2006). Specifically, the HDS assesses discouragement, frustration, worry, and burden related to physical illness. Internal consistency reliability of the MSQOL-54 has been reported from 0.75 - 0.96 in individuals with multiple sclerosis (Vickrey, Hays, Harooni, & Myers, 1995). In that same population, test-retest intraclass correlation coefficients ranged from 0.67 - 0.96. Construct validity has been supported by correlations between MSQOL-54 scales and hospitalizations, depressive symptoms, and symptom severity. Though this scale has been primarily applied only to those individuals with MS and their families, assessing discouragement, frustration, worry, and burden related to illness in those with type 2 diabetes is of import in this study.

*Satisfaction with Life Scale.* The 5-item Satisfaction with Life Scale (SWLS) evaluates a person's judgment about their overall satisfaction with life (Diener, Emmons, Larsen, & Griffin, 1985). Participants indicate their degree of agreement/disagreement with each item and higher scores indicate greater life satisfaction (Utsey, Payne, Jackson, & Jones, 2002). In a study considering race-related stress and life satisfaction among elderly African Americans, Utsey et al. (2002) reported Cronbach's alpha of 0.72. According to Diener et al. (1985), 2-month test-retest correlation coefficient of 0.82 and a coefficient alpha 0.87. Validity data in the same study found the SWLS to be negatively and significantly correlated with personality measures of psychopathology and poor adjustment as well as positively and significantly correlated to other measures of subjective well-being.

*Basic Adlerian Scales for Interpersonal Success – Adult Form.* The Basic Adlerian Scales for Interpersonal Success – Adult Form (BASIS-A) measures personality variables intended to be helpful in understanding a person's life approach (Kern, Wheeler, & Curlette, 1997). The specific purpose of this inventory is to help identify how one's individual life-style contributes to the individual's problem solving approach related to the tasks of social, work, and intimate relationships. The cognitive schema measured by the BASIS-A: are Belonging-Social Interest, Going Along, Taking Charge, Wanting Recognition, and Being Cautious. For a richer understanding of results, there are additional subscales including: Harshness, Entitlement, Liked by All, Striving for Perfection, and Softness. Internal consistency (coefficient $\alpha$) has been measured and ranges from 0.82 - 0.87 (Curlette, Wheeler, & Kern, 1997; Wheeler, 1996). Test-retest reliability shows a moderate level of stability (Wheeler, 1996). Content and criterion-related validity has been established (Curlette et al., 1997).

*Procedure*

*Participants.* The participants will be African American women with a diagnosis of type 2 diabetes. Researchers at the Center for Disease Control's who have analyzed National Health and Nutrition Evaluation Survey (NHANES) data to date suggest that the prevalence of type 2 diabetes in African American women is most prevalent in those 45 years old and older (CDC, n.d.). The sampling frame consists of patients meeting inclusion criteria that present to the East Carolina University Brody School of Medicine's Family Medicine Center (FMC) with scheduled primary care appointments. Inclusion criteria include female sex, African American ethnicity, age 45 years and older, diagnosis of type 2 diabetes mellitus. The sample in this study will be one of convenience. After approval from the Institutional Review Board (IRB), weekly schedule reviews for all patients scheduled for primary care appointments at the FMC will identify patients who meet inclusion criteria. Upon arrival at their appointment, a research assistant will ask the patient whether she would be interested in participating in a research project about African American women and diabetes. If the patient agrees, she will be provided with the appropriate IRB consent forms which will include a release to allow the primary investigator to access her EMRs for research purposes. Participants will be informed of their right to discontinue the survey, withdraw from the study, and revoke their consent at any time without any penalty.

After providing formal informed consent, participants will be given the Diabetes Survey (Appendix A) for completion. A research assistant will be available to help the participants if they need support. Participants may need assistance and/or support due to poor vision, low literacy, inattention, manual dexterity, advanced age, etc. Upon completion of the survey, participants will receive an incentive assortment of diabetes-specific supplies and information (e.g. soul food diabetes cookbooks, diabetes-specific snacks, foot care kits, band aids, anti-bacterial hand lotion). Surveys will be entered into a spreadsheet under the participant's Participant ID, which will be assigned upon study enrollment and consent. Completed surveys will be kept in the primary investigator's office in a locked file cabinet to which only she has access. After data have been entered and analyzed, the completed surveys will be destroyed via the FMC's protected health information's (PHI) shredding/disposal service.

*Chart review*. Upon consent, participants' EMRs will be reviewed for specific diabetes biomarkers. The primary investigator will review the EMRs of each participant who completes the Diabetes Survey. The review will occur no more than one week after each participant's visit to the FMC. This will ensure that their current chart information will correspond to the answers they provide on their Diabetes Survey. Abstracted data will include: hemoglobin A1c (HbA1c), low density lipoprotein cholesterol(LDL), body mass index (BMI), blood pressure, and prescribed diabetes medications.

Confidentiality and risk management will be a priority. Participants will be given a Participant ID upon their consent and subsequent enrollment in the study. This ID will be linked to their EMR ID number. The organizational list will be kept in the primary investigator's office in a locked file cabinet to which only she has access. After data have been entered and analyzed, information obtained via chart review will be destroyed via the FMC's protected health information's (PHI) shredding/disposal service.

*Data analysis.* The primary aim of data analysis in this study is to explore the multiplicative influences of biopsychosocial predictor variables on type 2 diabetes clinical outcomes in African American women. Upon completion of data collection, the investigator will explore the descriptive statistics associated with each predictor variable. Next, bivariate relationships between each variable and the clinical outcomes in the study will be calculated. A linear regression model will be generated to identify those predictor variables resulting in significant multivariate relationships with the specified clinical outcomes. The investigator will explore and identify possible suppressor and moderator variables.

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Appendix C

# Diabetes Survey

IDX# ____________________

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

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

1. Do you have diabetes?
2. What year were you first told you had diabetes? __ __ __ __
3. What other diagnoses do you have?
   ____________________________________________________________________________
   ____________________________________________________________________________
4. What is your marital status
   a. Never married
   b. Dating
   c. Living together
   d. Married
   e. Separated/divorced
   f. Widowed
5. Where do you live most of the year?
   a. Your home, apartment, or condo
   b. Retirement home
   c. Home of a relative or friend
   d. Adult group home
   e. Other ________________________________________
6. How many people live with you? _______
7. How much education do you have?
   a. 8th grade or less
   b. Some high school
   c. High school graduate or GED
   d. Some college or technical school
   e. College graduate (bachelor’s degree)
   f. Graduate degree (master’s degree or higher)
8. Which of the following best describes your current employment status (circle all that apply)?
   a. Work full-time (35 hours or more each week)
   b. Work part-time (less than 35 hours each week)
   c. Unemployed or laid off <u>and</u> looking for work
   d. Unemployed or laid off <u>and not</u> looking for work
   e. Homemaker
   f. In school
   g. Retired
   h. Disabled, not able to work
   i. Other (Please specify) ____________________________

9. Which of the categories below best describes your total annual combined household income from all sources?
    a. Less than $5000
    b. $5,000 to $9,999
    c. $10,000 to $14,999
    d. $15,000 to $19,999
    e. $20,000 to $29,999
    f. $30,000 to $39,999
    g. $40,000 to $49,999
    h. $50,000 and over
10. How would you describe the insurance plan(s) you have had <u>in the past 12 months</u>? (Check all that apply.)
    a. An individual plan – you pay the premium
    b. A group plan through an employer, union, etc – employer pays all or part of the premium
    c. US Government Health Plan (e.g., Military, Tricare, VA)
    d. Medicare
    e. Medicaid
    f. I have not had an insurance plan in the past 12 months
11. Do you test your blood sugar?
    a. Yes
    b. No
12. If you test your blood sugar, how many days a week do you test it? ________ days/week
13. On days that you test, how many times do you test your blood sugar? _________ times/day
14. If you test your blood sugar, do you keep a record of the results?
    a. Yes
    b. No
    c. Only unusual results
15. In general, how would you describe your health?
    a. Excellent
    b. Very good
    c. Good
    d. Fair
    e. Poor
16. Has your health care provider or nurse ever told you to take special care of your feet?
    a. Yes
    b. No
    c. Not Sure
17. Has your heath care provider or nurse ever told you to follow an exercise program?
    a. Yes
    b. No
    c. Not Sure
18. Has your health care provider or nurse ever told you to follow a meal plan or diet?
    a. Yes
    b. No
    c. Not Sure
    d.

19. Have you ever received diabetes education? (for example: attended a serious of classes with a diabetes educator or nutritionist)?
    a. Yes
    b. No
    c. Not Sure

20. How do you rate your understanding of:

| | Poor | | Good | | Excellent |
|---|---|---|---|---|---|
| a. your 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 testing? | 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 |

21. I **want** a lot of help and support from my family or friends in:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree | Does Not Apply |
|---|---|---|---|---|---|---|
| a. following my meal plan or diet. | 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 blood sugar. | 1 | 2 | 3 | 4 | 5 | N/A |
| handling my feelings about diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |

22. My family or friends help and support me a lot to:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree | Does Not Apply |
|---|---|---|---|---|---|---|
| a. following my meal plan or diet. | 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 blood sugar. | 1 | 2 | 3 | 4 | 5 | N/A |
| handling my feelings about diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |

23. I feel that my family or friends:

| | **Strongly Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Strongly Agree** | **Does Not Apply** |
|---|---|---|---|---|---|---|
| a. accept me and my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| b. feel uncomfortable about me because of my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| c. encourage or reassure me about my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| d. discourage or upset me about my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| e. listen to me when I want to talk about my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| f. nag me about my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |

24. Who helps you the **most** in caring for your diabetes?
    a. Spouse
    b. Other family member(s)
    c. Friends
    d. Paid helper
    e. Doctor
    f. Nurse
    g. Case manager
    h. Other health care professional
    i. Other _______________
    j. No one

25. During the past year, how often did your blood sugar become **too high** because:

| | **Never** | | **Sometimes** | | **Often** | **Don't Know** |
|---|---|---|---|---|---|---|
| a. you were sick or had an infection? | 1 | 2 | 3 | 4 | 5 | D/K |
| you were upset or angry? | 1 | 2 | 3 | 4 | 5 | D/K |
| you took the wrong amount of medicine? | 1 | 2 | 3 | 4 | 5 | D/K |
| you ate the wrong types of food? | 1 | 2 | 3 | 4 | 5 | D/K |

| | | | | | | |
|---|---|---|---|---|---|---|
| you ate too much food? | 1 | 2 | 3 | 4 | 5 | D/K |
| you had less physical activity than usual? | 1 | 2 | 3 | 4 | 5 | D/K |
| you were feeling stressed? | 1 | 2 | 3 | 4 | 5 | D/K |

26. During the past year, how often did your blood sugar become **too low** because:

| | **Never** | | **Sometimes** | | **Often** | **Don't Know** |
|---|---|---|---|---|---|---|
| a. you were sick or had an infection? | 1 | 2 | 3 | 4 | 5 | D/K |
| you were upset or angry? | 1 | 2 | 3 | 4 | 5 | D/K |
| you took the wrong amount of medicine? | 1 | 2 | 3 | 4 | 5 | D/K |
| you ate the wrong types of food? | 1 | 2 | 3 | 4 | 5 | D/K |
| you ate too little food? | 1 | 2 | 3 | 4 | 5 | D/K |
| you had more physical activity than usual? | 1 | 2 | 3 | 4 | 5 | D/K |
| you were feeling stressed? | 1 | 2 | 3 | 4 | 5 | D/K |

27. How often has your diabetes kept you from doing your normal daily activities during the past **year** (for example, couldn't go to church or visit friends)?

| **Never** | | **Sometimes** | | **Often** | **Don't Know** |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | D/K |

28. My diabetes and its treatment keep me from:

| | **Strongly Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Strongly Agree** | **Does Not Apply** |
|---|---|---|---|---|---|---|
| a. having enough money. | 1 | 2 | 3 | 4 | 5 | N/A |
| b. meeting work, household, and other responsibilities. | 1 | 2 | 3 | 4 | 5 | N/A |
| c. going out or traveling as I did before. | 1 | 2 | 3 | 4 | 5 | N/A |
| d. being as active as I want. | 1 | 2 | 3 | 4 | 5 | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| e. eating foods that I like. | 1 | 2 | 3 | 4 | 5 | N/A |
| f. having good relationships with my family. | 1 | 2 | 3 | 4 | 5 | N/A |
| g. having good relationships with people. | 1 | 2 | 3 | 4 | 5 | N/A |
| h. keeping a schedule I like. | 1 | 2 | 3 | 4 | 5 | N/A |
| i. spending time with my friends. | 1 | 2 | 3 | 4 | 5 | N/A |
| j. having enough time alone. | 1 | 2 | 3 | 4 | 5 | N/A |

29. Paying for my diabetes treatment and supplies is a problem.

| **Strongly Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Strongly Agree** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

30. Having diabetes makes my life difficult.

| **Strongly Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Strongly Agree** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

31. For the following questions, please circle your response.

| | **Strongly Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| a. I am afraid of my diabetes. | 1 | 2 | 3 | 4 | 5 |
| b. I find it hard to believe that I really have diabetes. | 1 | 2 | 3 | 4 | 5 |
| c. I feel unhappy and depressed because of my diabetes. | 1 | 2 | 3 | 4 | 5 |
| d. I feel satisfied with my life. | 1 | 2 | 3 | 4 | 5 |
| e. I feel I am not as good as others because of my diabetes. | 1 | 2 | 3 | 4 | 5 |
| f. I find it hard to do all the things I have to do for my diabetes. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| g. Diabetes doesn't affect my life at all. | 1 | 2 | 3 | 4 | 5 |
| h. I am doing pretty well, all things considered. | 1 | 2 | 3 | 4 | 5 |
| i. Things are going very well for me right now. | 1 | 2 | 3 | 4 | 5 |

32. I am **able** to:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
|---|---|---|---|---|---|
| a. keep my blood sugar in good control. | 1 | 2 | 3 | 4 | 5 |
| b. keep my weight in good control. | 1 | 2 | 3 | 4 | 5 |
| c. do the things I need to do for my diabetes (diet, medicine, exercise, etc.). | 1 | 2 | 3 | 4 | 5 |
| d. handle my feelings (fear, worry, anger) about my diabetes. | 1 | 2 | 3 | 4 | 5 |

33. I think it is **important** for me to:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
|---|---|---|---|---|---|
| a. keep my blood sugar in good control. | 1 | 2 | 3 | 4 | 5 |
| b. keep my weight in good control. | 1 | 2 | 3 | 4 | 5 |
| c. do the things I need to do for my diabetes (diet, medicine, exercise, etc.). | 1 | 2 | 3 | 4 | 5 |
| d. handle my feelings (fear, worry, anger) about my diabetes. | 1 | 2 | 3 | 4 | 5 |

34. Please circle one response for each line below.

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
|---|---|---|---|---|---|
| a. I keep my blood sugar in good control. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| b. I keep my weight in good control. | 1 | 2 | 3 | 4 | 5 |
| c. I do the things I need to do for my diabetes (diet, medicine, exercise, etc.). | 1 | 2 | 3 | 4 | 5 |
| d. I handle my feelings (fear, worry, anger) about my diabetes. | 1 | 2 | 3 | 4 | 5 |

35. Taking the best possible care of my diabetes will delay or prevent:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
|---|---|---|---|---|---|
| a. eye problems. | 1 | 2 | 3 | 4 | 5 |
| b. kidney problems. | 1 | 2 | 3 | 4 | 5 |
| c. food problems. | 1 | 2 | 3 | 4 | 5 |
| d. hardening of the arteries. | 1 | 2 | 3 | 4 | 5 |
| e. heart disease. | 1 | 2 | 3 | 4 | 5 |

36. How many days a week have you been told to test your blood sugar? ____________days/week
37. When you **do not** test for sugar as often as you have been told to do so, is it because:

| | Rarely | | Sometimes | | Often |
|---|---|---|---|---|---|
| a. you forgot? | 1 | 2 | 3 | 4 | 5 |
| b. you don't think it is useful? | 1 | 2 | 3 | 4 | 5 |
| c. the time or place wasn't right? | 1 | 2 | 3 | 4 | 5 |
| d. you don't like to do it? | 1 | 2 | 3 | 4 | 5 |
| e. you ran out of test materials? | 1 | 2 | 3 | 4 | 5 |
| f. it costs too much? | 1 | 2 | 3 | 4 | 5 |
| g. it's too much trouble? | 1 | 2 | 3 | 4 | 5 |
| h. it's hard to read the results? | 1 | 2 | 3 | 4 | 5 |
| i. you can't do it by yourself? | 1 | 2 | 3 | 4 | 5 |
| j. your levels don't change that often? | 1 | 2 | 3 | 4 | 5 |
| k. it hurts to prick yourself? | 1 | 2 | 3 | 4 | 5 |
| l. you don't want to see the results? | 1 | 2 | 3 | 4 | 5 |
| m. no one else cares? | 1 | 2 | 3 | 4 | 5 |

38. In general, I believe that I:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| a. know what part(s) of taking care of my diabetes that I am **dissatisfied** with. | 1 | 2 | 3 | 4 | 5 |
| b. am able to turn my diabetes goals into a workable plan. | 1 | 2 | 3 | 4 | 5 |
| c. can try out different ways of overcoming barriers to my diabetes goals. | 1 | 2 | 3 | 4 | 5 |
| d. can find ways to feel better about **having** diabetes. | 1 | 2 | 3 | 4 | 5 |
| e. know the **positive** ways I cope with diabetes-related stress. | 1 | 2 | 3 | 4 | 5 |
| f. can ask for support for having and caring for my diabetes when I need it. | 1 | 2 | 3 | 4 | 5 |
| g. know what helps me stay motivated to care for my diabetes. | 1 | 2 | 3 | 4 | 5 |
| h. know enough about myself as a person to make diabetes care choices that are right for me. | 1 | 2 | 3 | 4 | 5 |

These questions ask about how you feel and how things have been with you **during the past 2 weeks**. For each question, please circle the one answer that comes closest to the way you have been feeling.

39. Over the **past 2 weeks**, how often have you been bothered by the following problems?

| | **Not at All** | **Several Days** | **More than Half of the Days** | **Nearly Every Day** |
|---|---|---|---|---|
| a. Little interest or pleasure in doing things | 0 | 1 | 2 | 3 |
| b. Feeling down, depressed, or hopeless | 0 | 1 | 2 | 3 |
| c. Trouble falling or staying asleep, or sleeping too much | 0 | 1 | 2 | 3 |

| | | | | |
|---|---|---|---|---|
| d. Feeling tired or having little energy | 0 | 1 | 2 | 3 |
| e. Poor appetite or overeating | 0 | 1 | 2 | 3 |
| f. Feeling bad about yourself - or that you are a failure or have let yourself or your family down | 0 | 1 | 2 | 3 |
| g. Trouble concentrating on things, such as reading the newspaper or watching television | 0 | 1 | 2 | 3 |
| h. Moving or speaking so slowly that other people could have noticed. Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual | 0 | 1 | 2 | 3 |
| i. Thoughts that you would be better off dead, or of hurting yourself in some way | 0 | 1 | 2 | 3 |

40. When we face problems or difficulties in our family, we respond by:

| | **Strongly Disagree** | **Moderately Disagree** | **Neither Agree or Disagree** | **Moderately Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| a. sharing our difficulties with relatives. | 1 | 2 | 3 | 4 | 5 |
| b. seeking encouragement and support from friends. | 1 | 2 | 3 | 4 | 5 |
| c. knowing we have the power to solve major problems. | 1 | 2 | 3 | 4 | 5 |
| d. seeking information and advice from persons in other families who have faced the same or similar problems. | 1 | 2 | 3 | 4 | 5 |
| e. seeking advice from relatives (grandparents, etc.). | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| f. seeking assistance from community agencies and programs designed to help families in our situation. | 1 | 2 | 3 | 4 | 5 |
| g. knowing that we have the strength within our own family to solve our problems. | 1 | 2 | 3 | 4 | 5 |
| h. receiving gifts and favors from neighbors (e.g., food, taking in mail, etc.). | 1 | 2 | 3 | 4 | 5 |
| i. seeking information and advice from the family doctor. | 1 | 2 | 3 | 4 | 5 |
| j. asking neighbors for favors and assistance. | 1 | 2 | 3 | 4 | 5 |
| k. facing the problems "head-on" and trying to get solution right away. | 1 | 2 | 3 | 4 | 5 |
| l. watching television. | 1 | 2 | 3 | 4 | 5 |
| m. showing that we are strong. | 1 | 2 | 3 | 4 | 5 |
| n. attending church services. | 1 | 2 | 3 | 4 | 5 |
| o. accepting stressful events as a fact of life. | 1 | 2 | 3 | 4 | 5 |
| p. sharing concerns with close friends. | 1 | 2 | 3 | 4 | 5 |
| q. knowing luck plays a big part in how well we are able to solve family problems. | 1 | 2 | 3 | 4 | 5 |
| r. exercising with friends to stay fit and reduce tension. | 1 | 2 | 3 | 4 | 5 |
| s. accepting that difficulties occur unexpectedly. | 1 | 2 | 3 | 4 | 5 |
| t. doing things with relatives (get-togethers, dinners, etc.). | 1 | 2 | 3 | 4 | 5 |
| u. seeking professional counseling and help for family difficulties. | 1 | 2 | 3 | 4 | 5 |
| v. believing we can handle our own problems. | 1 | 2 | 3 | 4 | 5 |
| w. participating in church activities. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| x. defining the family problem in a more positive way so that we do not become too discouraged. | 1 | 2 | 3 | 4 | 5 |
| y. asking relatives how they feel about problems we face. | 1 | 2 | 3 | 4 | 5 |
| z. feeling that no matter what we do to prepare, we will have difficulty handling problems. | 1 | 2 | 3 | 4 | 5 |
| aa. seeking advice from a minister. | 1 | 2 | 3 | 4 | 5 |
| bb. believing if we wait long enough, the problem will go away. | 1 | 2 | 3 | 4 | 5 |
| cc. sharing problems with neighbors. | 1 | 2 | 3 | 4 | 5 |
| dd. having faith in God. | 1 | 2 | 3 | 4 | 5 |

41. Please circle the answer that best represents how much you agree with the following statements. Do not spend too much time considering your answer. Your first impression is usually best.

| | **Not at All** | **Somewhat** | **To a Large Extent** | **Completely** |
|---|---|---|---|---|
| a. Because of my diabetes, I miss the things I like to do most. | 1 | 2 | 3 | 4 |
| b. I can handle the problems related to my diabetes. | 1 | 2 | 3 | 4 |
| c. I have learned to live with my diabetes. | 1 | 2 | 3 | 4 |
| d. Dealing with my diabetes has made me a stronger person. | 1 | 2 | 3 | 4 |
| e. My diabetes controls my life. | 1 | 2 | 3 | 4 |
| f. I have learned a great deal from my diabetes. | 1 | 2 | 3 | 4 |
| g. My diabetes makes me feel useless at times. | 1 | 2 | 3 | 4 |
| h. My diabetes has made life more precious to me. | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| i. My diabetes prevents me from doing what I would really like to do. | 1 | 2 | 3 | 4 |
| j. I have learned to accept the limitations imposed by my diabetes. | 1 | 2 | 3 | 4 |
| k. Looking back, I can see that my diabetes has also brought about some positive changes in my life. | 1 | 2 | 3 | 4 |
| l. My diabetes limits me in everything that is important to me. | 1 | 2 | 3 | 4 |
| m. I can accept my diabetes well. | 1 | 2 | 3 | 4 |
| n. I think I can handle the problems related to my diabetes, even if the diabetes gets worse. | 1 | 2 | 3 | 4 |
| o. My diabetes frequently makes me feel helpless. | 1 | 2 | 3 | 4 |
| p. My diabetes has helped me realize what's important in life. | 1 | 2 | 3 | 4 |
| q. I can cope effectively with my diabetes. | 1 | 2 | 3 | 4 |
| r. My diabetes has taught me to enjoy the moment more. | 1 | 2 | 3 | 4 |

42. How much of the time during the past 4 weeks:

| | **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. were you discouraged by your health problems? | 1 | 2 | 3 | 4 | 5 | 6 |
| b. were you frustrated about your health? | 1 | 2 | 3 | 4 | 5 | 6 |
| c. was your health a worry in your life? | 1 | 2 | 3 | 4 | 5 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| d. did you feel weighed down by your health problems? | 1 | 2 | 3 | 4 | 5 | 6 |

43. Please circle the answer that best represents how much you agree with the following statements. Do not spend too much time considering your answer. Your first impression is usually best.

| | **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neutral** | **Slightly Agree** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|---|
| a. In most ways my life is close to my ideal. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| b. The conditions of my life are excellent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| c. I am satisfied with life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| d. So far I have gotten the important things I want in life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| e. If I could live my life over, I would change almost nothing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

44. When I was a child, I:

| | **Strongly Disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| 1. enjoyed playing with the other children. | 1 | 2 | 3 | 4 | 5 |
| 2. got special attention. | 1 | 2 | 3 | 4 | 5 |
| 3. liked telling others what to do. | 1 | 2 | 3 | 4 | 5 |
| 4. frequently had my feelings hurt in school. | 1 | 2 | 3 | 4 | 5 |
| 5. could not be honest with my parents. | 1 | 2 | 3 | 4 | 5 |
| 6. felt sure of myself in several areas. | 1 | 2 | 3 | 4 | 5 |
| 7. got more than I should have. | 1 | 2 | 3 | 4 | 5 |
| 8. bossed the other children. | 1 | 2 | 3 | 4 | 5 |
| 9. had several close friends. | 1 | 2 | 3 | 4 | 5 |
| 10. had a parent who felt I was hopeless. | 1 | 2 | 3 | 4 | 5 |
| 11. felt like I belonged. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| 12. caused my parents a lot of trouble. | 1 | 2 | 3 | 4 | 5 |
| 13. felt I had a lot of power. | 1 | 2 | 3 | 4 | 5 |
| 14. wanted to do well what was asked of me. | 1 | 2 | 3 | 4 | 5 |
| 15. felt inadequate at home. | 1 | 2 | 3 | 4 | 5 |
| 16. fit in well with a group. | 1 | 2 | 3 | 4 | 5 |
| 17. got even when I was punished. | 1 | 2 | 3 | 4 | 5 |
| 18. was bossy. | 1 | 2 | 3 | 4 | 5 |
| 19. felt important when I succeeded. | 1 | 2 | 3 | 4 | 5 |
| 20. had a parent who was angry with me. | 1 | 2 | 3 | 4 | 5 |
| 21. felt accepted by others. | 1 | 2 | 3 | 4 | 5 |
| 22. was friendly. | 1 | 2 | 3 | 4 | 5 |
| 23. felt equally at ease as a leader or follower. | 1 | 2 | 3 | 4 | 5 |
| 24. liked the attention I got for doing well. | 1 | 2 | 3 | 4 | 5 |
| 25. wanted to hurt a parent. | 1 | 2 | 3 | 4 | 5 |
| 26. felt equally at ease as a leader or follower. | 1 | 2 | 3 | 4 | 5 |
| 27. rebelled if I did not get my way. | 1 | 2 | 3 | 4 | 5 |
| 28. was good at showing people who was boss. | 1 | 2 | 3 | 4 | 5 |
| 29. felt accepted when I did well in school. | 1 | 2 | 3 | 4 | 5 |
| 30. thought one of my parents was mean. | 1 | 2 | 3 | 4 | 5 |
| 31. was outgoing. | 1 | 2 | 3 | 4 | 5 |
| 32. got in a lot of fights with other children. | 1 | 2 | 3 | 4 | 5 |
| 33. wanted to be in charge in school activities. | 1 | 2 | 3 | 4 | 5 |
| 34. behaved well to be noticed. | 1 | 2 | 3 | 4 | 5 |
| 35. was afraid of my parents. | 1 | 2 | 3 | 4 | 5 |
| 36. enjoyed being with other children. | 1 | 2 | 3 | 4 | 5 |
| 37. became more stubborn when punished. | 1 | 2 | 3 | 4 | 5 |
| 38. felt important when I could get the other children to do what I wanted. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| 39. pleased adults rather than upset them. | 1 | 2 | 3 | 4 | 5 |
| 40. just could not seem to do anything right at home. | 1 | 2 | 3 | 4 | 5 |
| 41. liked working in a group. | 1 | 2 | 3 | 4 | 5 |
| 42. fought back when I was teased by others. | 1 | 2 | 3 | 4 | 5 |
| 43. was treated fairly. | 1 | 2 | 3 | 4 | 5 |
| 44. was concerned with whether adults approved of what I did. | 1 | 2 | 3 | 4 | 5 |
| 45. did not like having responsibilities. | 1 | 2 | 3 | 4 | 5 |
| 46. was pampered at home. | 1 | 2 | 3 | 4 | 5 |
| 47. wanted to get even. | 1 | 2 | 3 | 4 | 5 |
| 48. had trouble making friends. | 1 | 2 | 3 | 4 | 5 |
| 49. was glad I could please my parents. | 1 | 2 | 3 | 4 | 5 |
| 50. succeeded in most things I tried. | 1 | 2 | 3 | 4 | 5 |
| 51. was given everything I wanted at home. | 1 | 2 | 3 | 4 | 5 |
| 52. openly rebelled to get even with others. | 1 | 2 | 3 | 4 | 5 |
| 53. wanted to be left alone. | 1 | 2 | 3 | 4 | 5 |
| 54. wanted a parent's approval. | 1 | 2 | 3 | 4 | 5 |
| 55. tried to avoid doing work around the home. | 1 | 2 | 3 | 4 | 5 |
| 56. got my way. | 1 | 2 | 3 | 4 | 5 |
| 57. needed to be tough to belong to the group. | 1 | 2 | 3 | 4 | 5 |
| 58. felt I was a victim of other people's anger. | 1 | 2 | 3 | 4 | 5 |
| 59. was concerned about being liked. | 1 | 2 | 3 | 4 | 5 |
| 60. did many things well. | 1 | 2 | 3 | 4 | 5 |
| 61. was spoiled. | 1 | 2 | 3 | 4 | 5 |
| 62. got my revenge. | 1 | 2 | 3 | 4 | 5 |
| 63. always wanted to go to be on time. | 1 | 2 | 3 | 4 | 5 |
| 64. wanted the teacher to like me. | 1 | 2 | 3 | 4 | 5 |
| 65. was good at taking care of details. | 1 | 2 | 3 | 4 | 5 |

Appendix B

## Form A: Application for Funding from the Family Medicine Research/Scholarship Pooled Funds

**Background:** The overall purpose of this mini-grant program is to aid both new and established investigators in developing research/scholarship programs that have the potential to be nationally competitive for funding by major foundations, industry or by the NIH, AHRQ or other agencies.

**Use this form (Form A) for any of the following purposes:**

**To foster additional research/scholarship in the Department of Family Medicine**

- **Provide start-up or mini-grant funds not to exceed $5,000**
- **To hire a research assistant or graduate assistant**
- **To provide bridge funds for investigators between grants**

**Eligibility:** To be eligible, the individual/team must hold a tenured, tenure track, or fixed-term appointment as a regular faculty member in the Department of Family Medicine. Residents-in-Training and Fellows are not eligible as principal investigators but may work with a faculty member as a co-investigator in submitting an application.

**Guidelines/Stipulations:**

1. Investigators may apply for a maximum of 1-year. The maximum mini-grant award is $5,000 for a one-year period. The maximum for faculty travel and consultant travel is $1,500.
2. Monies are to be used for supplies, other project costs, equipment, personnel (research assistant, graduate assistant, technician; not as a faculty offset), and travel as described above under purpose.
3. Only the direct costs of the research program will be considered for funding (no indirect costs).
4. The requesting faculty member must agree to provide a brief written progress report to the Department's Executive Council within 90 days of completion of the use of funds, highlighting the accomplishments associated with the use of the funds.
5. Proposals recommended for funding which involve research on human subjects will have to provide documentation of approval by appropriate oversight committees (e.g. IRB, HIPPA).
6. Funds will terminate if the principal investigator/team obtains extramural funding for the same (or closely related) research project(s), or if he/she leaves ECUBSOM.
7. Grant proposals are not subject to internal routing *(no green packet needs to be sent to OSP).*

I/we agree to all of the terms and conditions of this internal grant award.

_______________________________________ ____________

Signature Date

_______________________________________ ____________

Signature Date

**FACULTY NAME(s):** April Hames, Doctoral Candidate; Jonathon Firnhaber, MD; Mark White, PhD, LMFT; Jennifer Hodgson, PhD, LMFT; Skip Cummings, Pharm D

PROJECT TITLE: Exploring the Psychosocial Aspects of African American Women with Type 2 Diabetes in the Family Medicine Center

## ABSTRACT OF RESEARCH/SCHOLARSHIP PROPOSED

**Background:** Diabetes is one of the most frequently seen diagnoses in the Family Medicine Center and it is a major public health problem in eastern NC as well as the United States. In ethnic minority groups, the impact of type 2 diabetes, in terms of prevalence, quality of life, disability, and death, is greatly magnified. African Americans, especially African American women, with type 2 diabetes have consistently higher rates of end-stage renal disease, neuropathy, retinopathy, blindness, and non-traumatic lower-extremity amputations. The biological aspects of type 2 diabetes do not solely explain the disparities in prevalence, morbidity, and mortality found in African American women with this diagnosis. Those with type 2 diabetes cannot be considered apart from their environments which impact mental health as well as disease self-management skills. Though domains such as depression, female sex, culture, spirituality, and socioeconomic status have been established as indicators of diabetes management and outcomes, little is known about the relationship between the psychosocial domains of psychosocial support, family dynamics, and meaning making, and type 2 diabetes management and outcomes in African American women. To better understand these often overlooked aspects of diabetes self-care and outcomes within the Family Medicine Center, these components must be systematically studied and evaluated in the context of the diabetes biomarkers in these patients. This evaluation and chart review requires time, data management skills, and an adequate participant pool.

**Objective:** Our objective is to improve the quality of diabetes care in our Family Medicine Center by appropriate, systematic identification of the impact of psychosocial variables on type 2 diabetes management in African American women by: identification of African American women with type 2 diabetes; collecting survey data related to family support/dynamics, mental health, meaning making, and culture; chart review; and eventual implementation of PDSA cycles to improve incorporation of the findings of this study into clinical encounters at the Family Medicine Center.

**Methods:** Our methods will be to identify African American female patients with type 2 diabetes through our Electronic Medical Record, and administer psychometric inventories to those willing to participate. We will then compare the results to diabetes biomarkers in those patients at the Family Medicine Center who were willing to participate. Ultimately, PDSA cycles may be implemented to address any psychosocial issues identified as targets for intervention and participants' biomarkers may be re-evaluated at a later date after implementation. Additional qualitative interviews of significant cases will also be performed to gather additional information.

**Anticipated Results/Significance:** We anticipate that we will do the following:

- Complete the first study in the known literature investigating the role of multiple psychosocial aspects (family, culture, gender, meaning making, etc) of type 2 diabetes management specifically in African American women
- Identify and explore the influence of psychosocial aspects of type 2 diabetes management and outcomes in African American women
- Incorporate findings into relevant applied research in the Family Medicine Center focused on type 2 diabetes and management in African American women
- Increase systemic understanding of type 2 diabetes management in African American women in the Family Medicine Center among Faculty, Staff, Residents, and visiting Medical Students

- Dissemination of findings to national organization(s), relevant journal(s), and interested parties (i.e., Collaborative Family Healthcare Association (CFHA))
- Significantly improve the likelihood of additional funding

**Likelihood of grant funding:** Currently, we have no other funding. However, we are planning to apply to several more sources contingent on the pilot data to do so. This is a very important line of thinking that is relevant to the integrity of our public health and a major area in need of further exploration within our Family Medicine Clinic as well as most other areas within the United States.

**TOTAL AMOUNT REQUESTED:** $5,000.00 **TERM:** from 1/1/2009 to 12/31/2009

**BUDGET PROPOSED:**

**A. Personnel (specify employee type, rate of pay, and duration of employment):**

- Graduate Assistant ($12/hr x 20 hrs/week x 8 weeks) $1,920.00

**B. Equipment (please attach written quotes):**

- NONE

**C. Supplies (please attach written quotes):**

- BASIS-A Psychological Test Booklets ($85.00/25 pack x 4 sets +$9.00 shipping) $349.00
- $10 Wal-Mart Gift Card Incentives for participants (110) $1,100.00

**D. Other (please attach written quotes):**

- Travel to attend/present finding at CFHA National Conference (itemized below) $1826.00
    - Air transportation ($600.00)
    - Conference Registration ($350.00)
    - Lodging ($876.00)
- Travel for follow-up qualitative interviews with representative and/or significant cases (approximately 250 miles x $.585/mile) $146.25

**BUDGET JUSTIFICATION**

Completion of the proposed research will require direct recruitment of patients for participation in the study and face-to-face interviews to complete the psychometric inventories. Funding is requested to pay the salary of a graduate assistant who will have the primary responsibility for patient recruitment, patient interviews, and subsequent chart review to gather biomedical outcome data. To increase participation from eligible subjects, those volunteering to participate will receive a gift card in the value of $10.00 to compensate them for the time required to complete the psychometric inventories. The budgeted amount anticipates recruiting 110 participants over the 8 weeks of data collection in the study. While most of the psychometric inventories to be used in this study are in the public domain, funds are requested to purchase one proprietary measure critical to the analysis. Finally, funding is requested for travel expenses to support the PI in obtaining further education and skills in this area as well as disseminating the findings of this study at a national conference and for local travel for additional qualitative analysis of psychosocial factors impacting study participants.

# Appendix C

## Guidelines on the Use of Rebated Indirect Cost Funds

## Department of Family Medicine

Background. Indirect costs are those costs (for example, the costs associated with space, utilities, equipment, accounting, sponsored programs, etc that are needed for grant-related work) over and above the direct costs of the project, that an institution attempts to recoup from the funding agency when it submits a grant request. Depending upon the funding agency and type of grant, indirect costs may or may not be available. When indirect funds are available and come to the university, the majority of those indirect cost dollars (70%) are retained by the UNC system and the university. However, **30% of the indirect cost dollars are rebated to the Brody School of Medicine (BSOM)** on grants that originate from the BSOM. A university policy states that these funds be divided as follows: 10% to the BSOM, 10% to the originating department, and 10% to the principal investigator. The 10% allocated to the principal investigator and/or grant author(s) – these individual(s) are determined by the Chair - shall be established by the administrators office as an account for the investigator/author(s) to use for relevant expenses allowable by the University. The 10% that comes back to the Department shall constitute a "rebated indirect costs fund/account" and the following guidelines are in force for use of these funds.

Goals. The following goals for the use of rebated indirect cost funds were agreed upon and specific examples identified under each goal:

2. **To foster additional research/scholarship in the Department of Family Medicine**
    - **Provide start-up or mini-grant funds not to exceed $5,000**
    - **To hire a research assistant or graduate assistant**
    - **To provide bridge funds for investigators between grants**
    - **To purchase computer hardware/software to facilitate scholarly work** (note that all equipment remains the property of the university, not the property of the investigator)
3. **To develop faculty members to enhance their research/scholarship capabilities**
    - **Support faculty training/attendance at a workshop or seminar that will enhance their research abilities and improve chances of getting grant funding**
    - **To bring a collaborator/consultant/speaker to campus that will enhance faculty skills and may lead to a collaborative partnership with another university**
    - **To purchase journals or books to keep faculty apprised of the latest research**
    - **To support internal/local faculty development programs that enhance faculty research skills**
4. **To support travel to a meeting to present a research/scholarly paper (not just CE travel)**
5. **To support travel to another university for collaboration or to attend a grant planning meeting in which there is a high likelihood of future grant funding**

Process. The following processes are to be used:

*Cap on Request.* No individual proposal for a mini-grant for a research/scholarly project may request more than $ 5,000 from the pooled funds. No individual request for research presentation or consultation travel funds may exceed a cap of $ 1,500 from the pooled funds.

*Application Process.* All applications for a mini-grant, to hire a graduate assistant/research assistant, or to provide bridge funds for investigators between grants must complete the attached application form **(Form A)** describing the relevant project. Requests for all other purposes (to support travel costs to present an accepted paper at a meeting, to purchase computer hardware/software to facilitate scholarly work, to support faculty training/attendance at a workshop or seminar that will enhance their research abilities and improve chances of getting grant funding, to bring a collaborator/consultant/speaker to campus that will enhance faculty research skills and may lead to a collaborative partnership with another university, to purchase journals or books to keep faculty apprised of the latest research, to support internal/local faculty development programs that enhance faculty research skills) should take the form of a written memo **(Form B)** with appropriate justification for the request and relevant attachments (e.g., notification of acceptance of paper for presentation and a copy of the submitted abstract, meeting agenda, consultant's CV, etc). If the faculty member requests funds for travel, equipment, supplies, etc, the faculty member is required to provide written justification for the proposed expenditures. For example, this might be a registration form for a conference, flight costs from a website, equipment quotes from a vendor, graduate assistant payment schedule, etc. Guesstimates are not allowed.

*Review.* All requests for funds from the Research/Scholarship Pooled Account will be received by the Chair's office for completeness (did they included the appropriate forms and attachments) and timeliness (meeting the deadline) and then will be delivered to an Indirect Costs Grants Review Committee elected by the departmental faculty (vs. appointed by the chair). The committee is recommended to have three members – one member being a fixed-term/clinical track faculty member, one member being a tenure-track or tenured faculty member, and one member being a faculty person from the Research Division. This committee will meet once a year shortly after the deadline for applications. They will review the submitted requests, rank them based on the merits of the application and the extent to which the proposal contributes to the goals defined above, and will make a specific recommendation to the Executive Council regarding funding. Three levels of preferential consideration will be included: Primary preference will be given to those applications most likely to result in new grant funding. Secondarily, preference will be given to applications coming from junior faculty trying to establish their scholarly career. Finally, all else being equal, a third level of preference will be given to those applications coming from individuals/teams that were part of a funded project team and helped generate the indirect cost dollars in this pool.

*Balance of funds.* For faculty members who are successful in being awarded some of these pooled funds, funds will be committed and available for a period not to exceed one year. If the faculty member or team does not use all of the committed funds within the one year period, these funds will automatically revert to the pooled account. However, the faculty member or team may request a time-limited extension in writing to the Chair's office with appropriate justification.

# APPENDIX C

1. Diabetes Survey

# Type 2 Diabetes Survey

IDX# ____________________

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

*Note: For this survey, a Health Care Provider refers to a doctor, nurse practitioner, or physician assistant.*

1. Do you have diabetes? _______

2. When were you told you had diabetes? __ __ __ __

3. What is your marital status?
   a. Never married
   b. Married
   c. Separated/divorced
   d. Widowed

4. Where do you live most of the year?
   a. Your home or apartment
   b. Retirement home
   c. Home of a relative or friend
   d. Adult group home
   e. Other

5. How many people live with you? _______

6. How much education do you have?
   a. 8th grade or less
   b. Some high school
   c. High school graduate or GED
   d. Some college
   e. College graduate
   f. Graduate degree

7. Which of the following best describes your current employment status?
   a. Work full-time
   b. Work part-time
   c. Unemployed
   d. Student
   e. Retired
   f. Disabled, not able to work

8. Which of the categories below best describes your total annual combined household income from all sources?
   a. Less than $5,000
   b. $5,000 to $14,999
   c. $15,000 to $29,999
   d. $30,000 to $44,999
   e. $45,000 and over

9. In general, how would you describe your health?
    a. Excellent
    b. Very good
    c. Good
    d. Fair
    e. Poor

10. Do you test your blood sugar?
    a. Yes
    b. No

11. If you test your blood sugar, how many **days a week** do you test it?

________ days/week

12. If you test your blood sugar, how many times **per day** do you test it?

_______ times/day

13. When you test your blood sugar, do you keep a record of the results?
    a. Yes
    b. No
    c. Only unusual results

14. When you don't test for sugar as often as you have been told to do, is it because:

| | **Rarely** | | **Sometimes** | | **Often** |
|---|---|---|---|---|---|
| a. you forgot? | 1 | 2 | 3 | 4 | 5 |
| b. you don't think it is useful? | 1 | 2 | 3 | 4 | 5 |
| c. the time or place wasn't right? | 1 | 2 | 3 | 4 | 5 |
| d. you don't like to do it? | 1 | 2 | 3 | 4 | 5 |
| e. you ran out of test materials? | 1 | 2 | 3 | 4 | 5 |
| f. it costs too much? | 1 | 2 | 3 | 4 | 5 |
| g. it's too much trouble? | 1 | 2 | 3 | 4 | 5 |
| h. it's hard to read the results? | 1 | 2 | 3 | 4 | 5 |
| i. you can't do it by yourself? | 1 | 2 | 3 | 4 | 5 |
| j. your levels don't change that often? | 1 | 2 | 3 | 4 | 5 |
| k. it hurts? | 1 | 2 | 3 | 4 | 5 |
| l. you don't want to see the results? | 1 | 2 | 3 | 4 | 5 |
| m. no one else cares? | 1 | 2 | 3 | 4 | 5 |

15. How do you rate your understanding of:

| | **Poor** | | **Good** | | **Excellent** |
|---|---|---|---|---|---|
| a. your 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 testing? | 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 |

16. Who helps you the most in caring for your diabetes?

a. Spouse
b. Other family member(s)
c. Friends
d. Paid helper
e. Doctor or Nurse
f. Other health care professional
g. No one

17. I want a lot of help and support from my family or friends in:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree | Does Not Apply |
|---|---|---|---|---|---|---|
| a. following my meal plan or diet. | 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 blood sugar. | 1 | 2 | 3 | 4 | 5 | N/A |
| f. handling my feelings about diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |

18. My family or friends help and support me a lot in:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree | Does Not Apply |
|---|---|---|---|---|---|---|
| a. following my meal plan or diet. | 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 blood sugar. | 1 | 2 | 3 | 4 | 5 | N/A |
| f. handling my feelings about diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |

19. I feel that my family or friends:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree | Does Not Apply |
|---|---|---|---|---|---|---|
| a. accept me and my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| b. feel uncomfortable about me because of my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| c. encourage or reassure me about my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| d. discourage or upset me about my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| e. listen to me when I want to talk about my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |
| f. nag me about my diabetes. | 1 | 2 | 3 | 4 | 5 | N/A |

20. When we face problems or difficulties in our family, we respond by:

| | **Strongly Disagree** | **Moderately Disagree** | **Neither Agree or Disagree** | **Moderately Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| a. Sharing our difficulties with relatives. | 1 | 2 | 3 | 4 | 5 |
| b. Seeking encouragement and support from friends. | 1 | 2 | 3 | 4 | 5 |
| c. Knowing we have the power to solve major problems. | 1 | 2 | 3 | 4 | 5 |
| d. Seeking information and advice from persons in other families who have faced the same or similar problems. | 1 | 2 | 3 | 4 | 5 |
| e. Seeking advice from relatives (grandparents, etc). | 1 | 2 | 3 | 4 | 5 |
| f. Seeking assistance from community agencies and programs designed to help families in our situation. | 1 | 2 | 3 | 4 | 5 |
| g. Knowing that we have the strength within our own family to solve our problems. | 1 | 2 | 3 | 4 | 5 |
| h. Receiving gifts and favors from neighbors (e.g., food, taking in mail, etc). | 1 | 2 | 3 | 4 | 5 |
| i. Seeking information and advice from the family doctor. | 1 | 2 | 3 | 4 | 5 |
| j. Asking neighbors for favors and assistance. | 1 | 2 | 3 | 4 | 5 |
| k. Facing the problems "head-on" and trying to get solution right away. | 1 | 2 | 3 | 4 | 5 |
| l. Watching television. | 1 | 2 | 3 | 4 | 5 |
| m. Showing that we are strong. | 1 | 2 | 3 | 4 | 5 |
| n. Attending church services. | 1 | 2 | 3 | 4 | 5 |
| o. Accepting stressful events as a fact of life. | 1 | 2 | 3 | 4 | 5 |
| p. Sharing concerns with close friends. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| q. Knowing luck plays a big part in how well we are able to solve family problems. | 1 | 2 | 3 | 4 | 5 |
| r. Exercising with friends to stay fit and reduce tension. | 1 | 2 | 3 | 4 | 5 |
| s. Accepting that difficulties occur unexpectedly. | 1 | 2 | 3 | 4 | 5 |
| t. Doing things with relatives (get-togethers, dinners, etc). | 1 | 2 | 3 | 4 | 5 |
| u. Seeking professional help for family difficulties. | 1 | 2 | 3 | 4 | 5 |
| v. Believing we can handle our own problems. | 1 | 2 | 3 | 4 | 5 |
| w. Participating in church activities. | 1 | 2 | 3 | 4 | 5 |
| x. Defining the family problem in a more positive way so that we do not become too discouraged. | 1 | 2 | 3 | 4 | 5 |
| y. Asking relatives how they feel about problems we face. | 1 | 2 | 3 | 4 | 5 |
| z. Feeling that no matter what we do to prepare, we will have difficulty handling problems. | 1 | 2 | 3 | 4 | 5 |
| aa. Seeking advice from a minister. | 1 | 2 | 3 | 4 | 5 |
| bb. Believing if we wait long enough, the problem will go away. | 1 | 2 | 3 | 4 | 5 |
| cc. Sharing problems with neighbors. | 1 | 2 | 3 | 4 | 5 |
| dd. Having faith in God. | 1 | 2 | 3 | 4 | 5 |

21. Having diabetes makes my life difficult.

| **Strongly Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Strongly Agree** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

22. How often has your diabetes kept you from doing your normal daily activities during the past year (for example, couldn't go to church or visit friends)?

| Never | | Sometimes | | Often | Don't Know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | D/K |

23. Paying for my diabetes treatment and supplies is a problem.

| Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

24. My diabetes and its treatment keep me from:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree | Does Not Apply |
|---|---|---|---|---|---|---|
| a. having enough money. | 1 | 2 | 3 | 4 | 5 | N/A |
| b. meeting work, household, and other responsibilities. | 1 | 2 | 3 | 4 | 5 | N/A |
| c. going out or traveling as I did before. | 1 | 2 | 3 | 4 | 5 | N/A |
| d. being as active as I want. | 1 | 2 | 3 | 4 | 5 | N/A |
| e. eating foods that I like. | 1 | 2 | 3 | 4 | 5 | N/A |
| f. having good relationships with my family. | 1 | 2 | 3 | 4 | 5 | N/A |
| g. having good relationships with people. | 1 | 2 | 3 | 4 | 5 | N/A |
| h. keeping a schedule I like. | 1 | 2 | 3 | 4 | 5 | N/A |
| i. spending time with my friends. | 1 | 2 | 3 | 4 | 5 | N/A |
| j. having enough time alone. | 1 | 2 | 3 | 4 | 5 | N/A |

25. For the following questions, please circle your response.

| | **Strongly Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| a. I am afraid of my diabetes. | 1 | 2 | 3 | 4 | 5 |
| b. I find it hard to believe that I really have diabetes. | 1 | 2 | 3 | 4 | 5 |
| c. I feel unhappy and depressed because of my diabetes. | 1 | 2 | 3 | 4 | 5 |
| d. I feel satisfied with my life. | 1 | 2 | 3 | 4 | 5 |
| e. I feel I am not as good as others because of my diabetes. | 1 | 2 | 3 | 4 | 5 |
| f. I find it hard to do all the things I have to do for my diabetes. | 1 | 2 | 3 | 4 | 5 |
| g. Diabetes doesn't affect my life at all. | 1 | 2 | 3 | 4 | 5 |
| h. I am doing pretty well, all things considered. | 1 | 2 | 3 | 4 | 5 |
| i. Things are going very well for me right now. | 1 | 2 | 3 | 4 | 5 |

26. I am able to:

| | **Strongly Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| a. keep my blood sugar in good control. | 1 | 2 | 3 | 4 | 5 |
| b. keep my weight in good control. | 1 | 2 | 3 | 4 | 5 |
| c. do the things I need to do for my diabetes (diet, medicine, exercise, etc). | 1 | 2 | 3 | 4 | 5 |
| d. handle my feelings (fear, worry, anger) about my diabetes. | 1 | 2 | 3 | 4 | 5 |

27. I think it is important for me to:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
|---|---|---|---|---|---|
| a. keep my blood sugar in good control. | 1 | 2 | 3 | 4 | 5 |
| b. keep my weight in good control. | 1 | 2 | 3 | 4 | 5 |
| c. do the things I need to do for my diabetes (diet, medicine, exercise, etc). | 1 | 2 | 3 | 4 | 5 |
| d. handle my feelings (fear, worry, anger) about my diabetes. | 1 | 2 | 3 | 4 | 5 |

28. Please circle one response for each line below.

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
|---|---|---|---|---|---|
| a. I keep my blood sugar in good control. | 1 | 2 | 3 | 4 | 5 |
| b. I keep my weight in good control. | 1 | 2 | 3 | 4 | 5 |
| c. I do the things I need to do for my diabetes (diet, medicine, exercise, etc). | 1 | 2 | 3 | 4 | 5 |
| d. I handle my feelings (fear, anger) about my diabetes. | 1 | 2 | 3 | 4 | 5 |

29. Taking the best possible care of my diabetes will delay or prevent:

| | Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
|---|---|---|---|---|---|
| a. eye problems. | 1 | 2 | 3 | 4 | 5 |
| b. kidney problems. | 1 | 2 | 3 | 4 | 5 |
| c. food problems. | 1 | 2 | 3 | 4 | 5 |
| d. hardening of the arteries. | 1 | 2 | 3 | 4 | 5 |
| e. heart disease. | 1 | 2 | 3 | 4 | 5 |

30. In general, I believe that I:

| | **Strongly Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| a. know what part(s) of taking care of my diabetes that I am dissatisfied with. | 1 | 2 | 3 | 4 | 5 |
| b. am able to turn my diabetes goals into a workable plan. | 1 | 2 | 3 | 4 | 5 |
| c. can try out different ways of overcoming barriers to my diabetes goals. | 1 | 2 | 3 | 4 | 5 |
| d. can find ways to feel better about having diabetes. | 1 | 2 | 3 | 4 | 5 |
| e. know the positive ways I cope with diabetes-related stress. | 1 | 2 | 3 | 4 | 5 |
| f. can ask for support for having and caring for my diabetes when I need it. | 1 | 2 | 3 | 4 | 5 |
| g. know what helps me stay motivated to care for my diabetes. | 1 | 2 | 3 | 4 | 5 |
| h. know enough about myself as a person to make diabetes care choices that are right for me. | 1 | 2 | 3 | 4 | 5 |

31. Please circle the answer that best represents how much you agree with the following statements. Do not spend too much time considering your answer. Your first impression is usually the best.

| | **Not at All** | **Somewhat** | **To a Large Extent** | **Completely** |
|---|---|---|---|---|
| a. Because of my diabetes, I miss the things I like to do most. | 1 | 2 | 3 | 4 |
| b. I can handle the problems related to my diabetes. | 1 | 2 | 3 | 4 |
| c. I have learned to live with my diabetes. | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| d. Dealing with my diabetes has made me a stronger person. | 1 | 2 | 3 | 4 |
| e. My diabetes controls my life. | 1 | 2 | 3 | 4 |
| f. I have learned a great deal from my diabetes. | 1 | 2 | 3 | 4 |
| g. My diabetes makes me feel useless at times. | 1 | 2 | 3 | 4 |
| h. My diabetes has made life more precious to me. | 1 | 2 | 3 | 4 |
| i. My diabetes prevents me from doing what I would really like to do. | 1 | 2 | 3 | 4 |
| j. I have learned to accept the limitations imposed by my diabetes. | 1 | 2 | 3 | 4 |
| k. Looking back, I can see that my diabetes has also brought about some positive changes in my life. | 1 | 2 | 3 | 4 |
| l. My diabetes limits me in everything that is important to me. | 1 | 2 | 3 | 4 |
| m. I can accept my diabetes well. | 1 | 2 | 3 | 4 |
| n. I think I can handle the problems related to my diabetes, even if the diabetes gets worse. | 1 | 2 | 3 | 4 |
| o. My diabetes frequently makes me feel helpless. | 1 | 2 | 3 | 4 |
| p. My diabetes has helped me realize what’s important in life. | 1 | 2 | 3 | 4 |
| q. I can cope effectively with my diabetes. | 1 | 2 | 3 | 4 |
| r. My diabetes has taught me to enjoy the moment more. | 1 | 2 | 3 | 4 |

32. How much of the time during the past 4 weeks:

| | **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. were you discouraged by your health problems? | 1 | 2 | 3 | 4 | 5 | 6 |
| b. were you frustrated about your health? | 1 | 2 | 3 | 4 | 5 | 6 |
| c. was your health a worry in your life? | 1 | 2 | 3 | 4 | 5 | 6 |
| d. did you feel weighed down by your health problems? | 1 | 2 | 3 | 4 | 5 | 6 |

33. Please circle the answer that best represents how much you agree with the following statements. Do not spend too much time considering your answer. Your first impression is usually the best.

| | **Strongly Disagree** | **Disagree** | **Slightly Disagree** | **Neutral** | **Slightly Agree** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|---|
| a. In most ways my life is close to my ideal. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| b. The conditions of my life are excellent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| c. I am satisfied with life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| d. So far I have gotten the important things I want in life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| e. If I could live my life over, I would change almost nothing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

34. Over the last 2 weeks, how often have you been bothered by any of the following problems?

| | **Not at All** | **Several Days** | **More than Half the Days** | **Nearly Every Day** |
|---|---|---|---|---|
| a. little interest or pleasure in doing things | 0 | 1 | 2 | 3 |
| b. feeling down, depressed, or hopeless | 0 | 1 | 2 | 3 |
| c. trouble falling or staying asleep, or sleeping too much | 0 | 1 | 2 | 3 |
| d. feeling tired or having little energy | 0 | 1 | 2 | 3 |
| e. poor appetite or overeating | 0 | 1 | 2 | 3 |
| f. feeling bad about yourself; or that you are a failure or have let yourself or your family down | 0 | 1 | 2 | 3 |
| g. trouble concentrating on things, such as reading the newspaper or watching tv | 0 | 1 | 2 | 3 |
| h. moving or speaking so slowly that other people could have noticed; or being so fidgety or restless that you have been moving around a lot more than usual | 0 | 1 | 2 | 3 |
| i. thoughts that you would be better off dead, or of hurting yourself in some way | 0 | 1 | 2 | 3 |

35. If you have been bothered by any of the problems above in the last 2 weeks, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?
    a. Not difficult at all
    b. Somewhat difficult
    c. Very difficult
    d. Extremely difficult

36. When I was a child, I:

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 1. enjoyed playing with the other children. | 1 | 2 | 3 | 4 | 5 |
| 2. got special attention. | 1 | 2 | 3 | 4 | 5 |
| 3. liked telling others what to do. | 1 | 2 | 3 | 4 | 5 |
| 4. frequently had my feelings hurt in school. | 1 | 2 | 3 | 4 | 5 |
| 5. could not be honest with my parents. | 1 | 2 | 3 | 4 | 5 |
| 6. felt sure of myself in several areas. | 1 | 2 | 3 | 4 | 5 |
| 7. got more than I should have. | 1 | 2 | 3 | 4 | 5 |
| 8. bossed the other children. | 1 | 2 | 3 | 4 | 5 |
| 9. had several close friends. | 1 | 2 | 3 | 4 | 5 |
| 10. had a parent who felt I was hopeless. | 1 | 2 | 3 | 4 | 5 |
| 11. felt like I belonged. | 1 | 2 | 3 | 4 | 5 |
| 12. caused my parents a lot of trouble. | 1 | 2 | 3 | 4 | 5 |
| 13. felt I had a lot of power. | 1 | 2 | 3 | 4 | 5 |
| 14. wanted to do well what was asked of me. | 1 | 2 | 3 | 4 | 5 |
| 15. felt inadequate at home. | 1 | 2 | 3 | 4 | 5 |
| 16. fit in well with a group. | 1 | 2 | 3 | 4 | 5 |
| 17. got even when I was punished. | 1 | 2 | 3 | 4 | 5 |
| 18. was bossy. | 1 | 2 | 3 | 4 | 5 |
| 19. felt important when I succeeded. | 1 | 2 | 3 | 4 | 5 |
| 20. had a parent who was angry with me. | 1 | 2 | 3 | 4 | 5 |
| 21. felt accepted by others. | 1 | 2 | 3 | 4 | 5 |
| 22. was friendly. | 1 | 2 | 3 | 4 | 5 |
| 23. wanted to control the other children. | 1 | 2 | 3 | 4 | 5 |
| 24. liked the attention I got for doing well. | 1 | 2 | 3 | 4 | 5 |
| 25. wanted to hurt a parent. | 1 | 2 | 3 | 4 | 5 |
| 26. felt equally at ease as a leader or follower. | 1 | 2 | 3 | 4 | 5 |
| 27. rebelled if I did not get my way. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| 28. was good at showing people who was boss. | 1 | 2 | 3 | 4 | 5 |
| 29. felt accepted when I did well in school. | 1 | 2 | 3 | 4 | 5 |
| 30. thought one of my parents was mean. | 1 | 2 | 3 | 4 | 5 |
| 31. was outgoing. | 1 | 2 | 3 | 4 | 5 |
| 32. got in a lot of fights with other children. | 1 | 2 | 3 | 4 | 5 |
| 33. wanted to be in charge in school activities. | 1 | 2 | 3 | 4 | 5 |
| 34. behaved well to be noticed. | 1 | 2 | 3 | 4 | 5 |
| 35. was afraid of my parents. | 1 | 2 | 3 | 4 | 5 |
| 36. enjoyed being with other children. | 1 | 2 | 3 | 4 | 5 |
| 37. became more stubborn when punished. | 1 | 2 | 3 | 4 | 5 |
| 38. felt important when I could get the other children to do what I wanted. | 1 | 2 | 3 | 4 | 5 |
| 39. pleased adults rather than upset them. | 1 | 2 | 3 | 4 | 5 |
| 40. just could not seem to do anything right at home. | 1 | 2 | 3 | 4 | 5 |
| 41. liked working in a group. | 1 | 2 | 3 | 4 | 5 |
| 42. fought back when I was teased by others. | 1 | 2 | 3 | 4 | 5 |
| 43. was treated fairly. | 1 | 2 | 3 | 4 | 5 |
| 44. was concerned with whether adults approved of what I did. | 1 | 2 | 3 | 4 | 5 |
| 45. did not like having responsibilities. | 1 | 2 | 3 | 4 | 5 |
| 46. was pampered at home. | 1 | 2 | 3 | 4 | 5 |
| 47. wanted to get even. | 1 | 2 | 3 | 4 | 5 |
| 48. had trouble making friends. | 1 | 2 | 3 | 4 | 5 |
| 49. was glad I could please my parents. | 1 | 2 | 3 | 4 | 5 |
| 50. succeeded in most things I tried. | 1 | 2 | 3 | 4 | 5 |
| 51. was given everything I wanted at home. | 1 | 2 | 3 | 4 | 5 |
| 52. openly rebelled to get even with others. | 1 | 2 | 3 | 4 | 5 |

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|---|---|---|---|---|---|
| 53. wanted to be left alone. | 1 | 2 | 3 | 4 | 5 |
| 54. wanted a parent's approval. | 1 | 2 | 3 | 4 | 5 |
| 55. tried to avoid doing work around the home. | 1 | 2 | 3 | 4 | 5 |
| 56. got my way. | 1 | 2 | 3 | 4 | 5 |
| 57. needed to be tough to belong to the group. | 1 | 2 | 3 | 4 | 5 |
| 58. felt I was a victim of other people's anger. | 1 | 2 | 3 | 4 | 5 |
| 59. was concerned about being liked. | 1 | 2 | 3 | 4 | 5 |
| 60. did many things well. | 1 | 2 | 3 | 4 | 5 |
| 61. was spoiled. | 1 | 2 | 3 | 4 | 5 |
| 62. got my revenge. | 1 | 2 | 3 | 4 | 5 |
| 63. always wanted to go to be on time. | 1 | 2 | 3 | 4 | 5 |
| 64. wanted the teacher to like me. | 1 | 2 | 3 | 4 | 5 |
| 65. was good at taking care of details. | 1 | 2 | 3 | 4 | 5 |

*Thank you so much for participating in this survey. Your time is valuable and much appreciated. Please accept this small gift as a symbol of our gratitude.*