ABSTRACT

Satisfaction with Life and Biopsychosocial-Spiritual Health among
Underserved Patients with Diabetes

By

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Spring, 2010

The prevalence of type 2 diabetes continues to escalate, especially among vulnerable and underserved populations (CDC, 2008); however, the current landscape of literature has not kept pace with the trends of those most affected. Available data have often pertained to nonunderserved groups and only address part of patients' physical, mental, social, or spiritual lives. The literature review and research articles included in this dissertation integrate available knowledge pertaining to the comprehensive experiences of underserved groups with type 2 diabetes and specifically the understudied concept of satisfaction with life (SWL) among African American and Hispanic minority groups.

The first article presented is a literature review written to synthesize studies of underserved populations with type 2 diabetes, including individuals who were of a minority ethnic group, socioeconomically disadvantaged, elderly, uninsured, and/or of lower educational level. The objective of this review was to amalgamate current evidence for underserved groups using a biopsychosocial-spiritual framework (Engel, 1977; Hodgson, Lamson, & Reese, 2007; Wright, Watson, & Bell, 1996). Themes and gaps in knowledge from approximately 1995 to the present were identified. Fifty-one studies

were reviewed and grouped into three themes pertaining to overall health and disease management, including: psychological influences; marital, familial, and environmental influences; and spiritual influences. Researchers documented a number of psychological, social, and spiritual variables influencing glycemic control. In particular, depression and relational conflict adversely influenced glycemic control in some cases, whereas availability of social support or spiritual resources frequently assisted in better disease management. Lack of demographic data and attention to diverse groups, as well as, incomplete empirical knowledge prompt the need for further research of the influences of disease management among underserved groups. Three recommendations are suggested: 1) further exploration of the relationship between psychosocial-spiritual influences on diabetes management for uniquely underserved groups; 2) investigation of demographic differences or similarities; and 3) development and use of clinical models incorporating a multidisciplinary, collaborative stance in addressing diabetes for vulnerable populations.

The second article extends current literature and aims to meet a number of the above mentioned recommendations. This article is focused on two groups with noted health disparities, African American and Hispanic minorities with type 2 diabetes. It was written to examine associations found between biomedical markers of disease management and psychosocial constructs and assess the correlates and predictors of variability for SWL. Data were collected from 142 minority patients (65 African American and 77 Hispanic) during their first visit within a collaborative care program. Pearson product moment correlations, multiple linear regressions, and one-way analysis of variance were used to examine research questions in this descriptive, quantitative

study. Only one weak, significant relationship was noted for BMI and somatization; otherwise, no noteworthy relationships were documented between psychosocial or spiritual constructs and biomedical markers of disease management (HbA1c and body mass index). Psychological distress, social support, and spirituality accounted for 63% of the variance in SWL for African American participants and 29% of the variance in SWL for Hispanic participants. Social support was the strongest predictor of SWL for African American participants, while psychological distress was the strongest predictor of SWL for Hispanic participants. Social support moderated the relationship between psychological distress and SWL for Hispanic participants, while social support did not moderate this relationship for African American participants. Spirituality did not moderate the relationship between psychological distress and SWL for either ethnic group. Clinicians and researchers who work with and study minority patients with uncontrolled type 2 diabetes may see improvement in patients' SWL when screening for and treating psychopathology, interpersonal strain, and existential struggles. Attention to ethnic variation in research and clinical practice is important since dissimilarity existed in the determinants of SWL and moderators of psychological distress and SWL.

SATISFACTION WITH LIFE AND BIOPSYCHOSOCIAL-SPIRITUAL HEALTH AMONG UNDERSERVED PATIENTS WITH DIABETES

A Dissertation Presented to
The Faculty of the Department of Child Development and Family Relations
East Carolina University

In Partial Fulfillment
Of the Requirements for the Degree
Doctor of Philosophy in Medical Family Therapy

By
Kenneth W. Phelps, MS
March, 2010

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DEDICATION

This dissertation is dedicated to my loving wife, Lauren Phelps, who has been a constant support during the dissertation process and my doctoral education. Through her encouragement and sacrifice, my journey in higher education has been gratifying and especially rewarding with my best friend by my side. I would also like to dedicate this dissertation to my parents, Phillip and Helen Phelps. My parents have always instilled in me a sense of persistence and compassion, which has provided me with the necessary tools for learning and achievement.

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On a personal note, I would like to recognize my incredible network of friends and family. Each day with these individuals brings awareness to why I believe in the power of relationships. In particular, I would like to acknowledge my family and in-laws for their assistance in making our move to New Hampshire as seamlessly as possible. Without this support, the completion of this dissertation and my internship would have been exponentially more difficult. My internship supervisors and associates, Dr. Bill Gunn, Joni Haley, and others, have been welcoming and flexible, which has made the completion of this research during my intern year all the more enjoyable. Finally, I would like to express thanks to my good friend and classmate, Keeley Pratt, who has been essential to my master and doctoral experiences through countless emails, phone calls, coffee runs, and academic discussions.

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PREFACE

The genesis of my interest in diabetes dates back to my first session as a family therapy intern. As a novice therapist, I found myself full of anticipation and theoretical knowledge as I approached my first couples therapy case with the presenting problem of “difficulty communicating about husband’s diabetes.” As therapy progressed, the discussions pertaining to emotional health, quality of life, and navigating boundaries sparked my interest in how chronic illness, specifically diabetes, influences the lives of patients and their social networks. Shortly thereafter, I accepted an internship placement with Greene County Health Care, Inc., which entailed working from a North Carolina Health and Wellness Trust Fund grant dedicated to collaborative care for underserved patients with diabetes. This placement was ideal for me given my upbringing in a rural, underserved area of North Carolina and passion for Medical Family Therapy. Over the next three years, I worked clinically for 20 hours per week with patients with type 2 diabetes and their families, assisting them in navigating the emotional, social, and spiritual implications of this diagnosis. My participation with the project from the beginning allowed me to have input into the data protocol and collection, leading to this dissertation. Through my research and clinical practice in this context, I was fascinated with how patients, who have often been subjugated or marginalized in society, could maintain such resilience and general satisfaction with life. Additionally, I became increasingly interested in how psychological distress, social supports (i.e., family, friends, significant others), and belief systems might influence this process for groups experiencing inequalities, such as ethnic minorities. From these initial interests began the impetus for the following dissertation, which includes two articles. The first article reflects the known biopsychosocial-spiritual findings of underserved patients with diabetes; while the second article addresses how two ethnic groups experience satisfaction with life among other psychosocial constructs. It is my hope that the articles will synthesize and add to the current landscape of literature, thereby generating a better understanding of how underserved patients with diabetes experience the illness.

Biopsychosocial Analysis of Underserved Populations with Type 2 Diabetes:

A Literature Review

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Abstract

As the prevalence of type 2 diabetes escalates, especially among vulnerable and underserved populations, providers within our healthcare system are under pressure to find innovative ways to conceptualize and treat this chronic illness. The objective of this literature review was to amalgamate current evidence for underserved populations with type 2 diabetes. A biopsychosocial-spiritual framework (Engel, 1977; Hodgson, Lamson, & Reese, 2007; Wright, Watson, & Bell, 1996) was used to identify themes and gaps in knowledge from approximately 1995 to the present. Fifty-one studies were reviewed and grouped into three themes pertaining to overall health and disease management, including: psychological influences; marital, familial, and environmental influences; and spiritual influences. Researchers documented a number of psychological, social, and spiritual variables influencing glycemic control. In particular, depression and relational conflict adversely influenced glycemic control in some cases, whereas availability of social support or spiritual resources frequently assisted in better disease management. Lack of demographic data and attention to diverse groups, as well as incomplete empirical knowledge prompt the need for further research of the influences of disease management among underserved groups.

Key words: type 2 diabetes, underserved, healthcare disparities, biopsychosocial, spiritual

Chapter One: Literature Review Article

The awareness and management of diabetes has become a key focus since diabetes was ranked the seventh leading cause of death in the United States (CDC, 2008). Recent epidemiological evidence from the CDC documented that a staggering 17.9 million individuals in the United States have been diagnosed with diabetes and another 5.7 million are believed to be diabetic, yet are undiagnosed. Looking forward, the presence of diabetes is estimated to reach 29 million cases by 2050 (Boyle et al., 2001). However, the burden of this diagnosis is not evenly distributed, since disparities exist in prevalence and complications for underserved groups (CDC, 2008; Egede & Dagogo-Jack, 2005; Hogan, Dall, & Nikolov, 2003; Miech, Kim, McConnell, & Hamman, 2009). The current epidemic of type 2 diabetes, especially among underserved groups, has influenced recent standards by the American Diabetes Association (ADA, 2010) toward a more comprehensive and integrated treatment plan. While type 2 diabetes has typically been diagnosed in adulthood, the recent increase in the incidence for adolescents has led the ADA to suggest earlier screening for the disease. Comparatively, the majority of those diagnosed continue to be adults and thereby the focus of this review.

Biopsychosocial-spiritual Framework

Historically, biomedical thinking predominated the treatment of disease; however, George Engel shifted the focus in 1977 toward a more comprehensive look at disease management. He proposed that consideration of psychological and social dimensions of illness were as important as cellular or molecular changes. More recently, Wright, Watson, and Bell's (1996) work added to this framework by stimulating consideration of how spirituality and belief systems might influence adaptability to illness. This spiritual component could likely fit within the psychological or social dimensions; however, some might consider it a distinct dimension of an expanded framework (Hodgson, Lamson, & Reese, 2007). In the present review, we used this expanded framework to categorize existing knowledge, thereby synthesizing data for underserved groups of adults with type 2 diabetes.

Health Disparities among the Underserved

Information gained through the study of psychological, social, and spiritual repercussions for disease management and health is vital; yet, this data would be inconsequential without a primer on the known health disparities for underserved groups. This primer is not meant to be an exhaustive presentation of disparities, but highlight a few noteworthy findings prior to the description of thematic groupings. For the purposes of this review, the classification of underserved and health disparate groups was based upon the definitions set forth by the United States Department of Health and Human Services, which included “All people who face barriers in accessing services because they have difficulty paying for services, they have language or cultural differences, or there is an insufficient number of resources available in their community” (1998; p. ¶ 2). This also includes inequality due to “gender, race or ethnicity, education, income, disability, geographic location, and/or sexual orientation (2000; p. 11). Thus, this review included studies of those populations encapsulated in their definitions.

Much of the health disparity lies between Caucasian groups and other ethnic groups, such as African American or Hispanic groups. The 2007 National Diabetes Fact

Sheet released by the CDC documented that 9.8% of Caucasian individuals have diabetes, while this number jumps to 14.7% for African American individuals. Projected prevalence rates for 2020 foretell continued disparities with a 107% increase for Hispanic groups and a 50% increase for African American groups, compared to only 27% increase for Caucasian groups (Hogan et al., 2003). Compounding this disparity in prevalence, higher rates of complications are present for ethnic minorities. Minority groups have greater risk of moderate to severe retinopathy, end stage renal disease, lower extremity amputation, and mortality compared to Caucasian groups (CDC, 2008; Harris, Klein, Cowie, Rowland, & Byrd-Holt, 1998; Lavery et al., 1996; Rostand, Kirk, Rutsky, & Pate, 1982). Health disparities faced by ethnic minorities are further augmented by educational inequalities.

Researchers recently explored the growing disparity in diabetes-related mortality using educational data from 1989 to 2005 for those aged 40-79 (Miech et al., 2009). Mortality among individuals with less than a high school education increased between 40 to 75%, while the mortality among individuals with a college degree decreased between 7 and 15%. The authors reported this disparity in outcomes occurred “by a quicker pace of improvement in diabetes-related factors among people with higher versus lower education” (p. 130). One hypothesis might be those with more education are earlier consumers for novel, innovative disease management strategies or technologies and have greater financial resources compared to those with lower education. These educational disparities may also lead to inaccurate beliefs or knowledge about diabetes and disease management.

Data from 4,978 individuals in the Third National Health and Nutrition Examination Survey has been used to document that the poverty income ratio (i.e., annual family income divided by the general poverty line) was predictive of prevalence of diabetes among African American and Caucasian women (Robbins, Vaccarino, Zhang, & Kasl, 2001). This trend was also present for men, but did not achieve statistical significance. Socioeconomic factors have also been shown to impact medication adherence. In one study, 43% of African Americans stopped using prescribed insulin due to financial strains (Musey et al., 1995). This is concerning as nonadherence to insulin regimens seriously impacted diabetic glycemic control and precipitated subjects being diagnosed with diabetic ketoacidosis. Low-income minorities have been shown to have misconceptions about appropriate levels of blood glucose, absence of a cure for the disease, and need to consistently take medication (Mann, Ponieman, Leventhal, & Halm, 2009). Financial strains often extend beyond obtaining and taking medication to actual healthcare access.

Limited access to health care, particularly among the uninsured, has been associated with what researchers named “the missing patient” (Zhang et al., 2008). Zhang et al. found the incidence of undetected diabetes was significantly associated with being uninsured or being without insurance for longer than one year. Other researchers have noted significantly higher glycated hemoglobin (HbA1c) among uninsured or those without trouble accessing care due to proximity or financial resources when compared to patients with better access to services (Benoit, Fleming, Philis-Tsimikas, & Ji, 2005; Rhee et al., 2005). Due to these disparities and a need to focus more on the underserved populations who are greatly impacted by type 2 diabetes, the following literature review was initiated.

Aims

In this paper, we aimed to: 1) explore the research-based literature directed toward the management of type 2 diabetes among underserved populations, 2) identify notable differences between subgroups of underserved patients by ethnicity, sex, and/or age, and 3) apply a biopsychosocial-spiritual framework to organize the research while identifying themes and gaps in knowledge.

Method

Two strategies were employed during this non-systematic review of the literature. The first was to identify relevant research using the following electronic databases: Medline via Ovid, Medline via PubMed, PsycInfo, and Psychological and Behavioral Sciences Collection**.** Studies spanning from approximately 1995 to the present relating to some aspect of the biopsychosocial-spiritual experiences of underserved individuals with type 2 diabetes were incorporated. This time period was selected to capture the most updated, relevant data over the last fifteen years pertaining to underserved groups. For some studies, only a subset of the sample was composed of underserved groups; consequently, details regarding demographics were incorporated throughout the review. The following key words formed the list of search terms: ‘underserved’ and ‘diabetes’ paired with ‘glycemic control,’ ‘disease management,’ ‘psychological,’ ‘depression,’ ‘social,’ ‘support,’ ‘spirituality,’ ‘religion,’ ‘biopsychosocial,’ and ‘health disparity.’ For the second search strategy, the reference lists for each retrieved article were reviewed for additional pertinent studies that may meet the inclusion criteria. Of these, one study published in 1994 was included from outside of the time period parameters due to our approximate, but not stringent, cut off.

The literature search resulted in a number of potentially relevant articles. The titles and abstracts of these articles were reviewed resulting in approximately 164 articles for full text review. Of all the studies reviewed, 51 met the inclusion criteria of being within peer reviewed journals, with adults 18 or older diagnosed with diabetes, and whose sample or portion of sample met criteria for belonging to an underserved population. We organized literature into three themes: 1) psychological influences, 2) marital, familial, and environmental influences, and 3) spiritual influences impacting disease management for underserved patients. Details of researchers' findings paired with critiques are integrated under each thematic description. These themes should be considered as overlapping elements of the diabetes experience rather than distinctive influences disconnected from one another; thus, a few articles are reviewed under multiple themes.

Psychological Influences

While there may be a variety of psychological implications of type 2 diabetes, depression has been the most researched co-morbid diagnosis. Thus, the majority of literature covered under this theme focused on depression's influence on diabetes management. A total of 30 studies were reviewed, including five meta-analyses and/or systematic literature reviews. Researchers using meta-analyses have established a significant association between depression and hyperglycemia (Lustman et al., 2000), greater odds of co-morbid depression for those with diabetes (Anderson, Freedland, Clouse, & Lustman, 2001), and higher prevalence rates of depression compared to nondiabetic control groups (Ali, Stone, Peters, Davies, & Khunti, 2006). However, inclusion of some individuals with type 1 diabetes, nonunderserved groups, and small effect sizes limit some applicability to the present review.

While depression has been highlighted as a risk factor in the worsening of glycemic control (Lustman et al., 2000), this finding may not be consistent for distinctively underserved groups. A team of researchers studied depression and glycemic control among 1,665 elderly, ethnically diverse participants (Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). They found an initial small, significant relationship between depression and HbA1c; however, neither baseline nor prospective analyses of depression significantly predicted changes in HbA1c, which may be due to minimal variability in glycemic values. Prior to this investigation, others found similar results, as variance in depressive scores was not accounted for by HbA1c when body mass index (BMI) was held constant for 146 Hawaiian/part-Hawaiian, Filipino American, Japanese American, and Caucasian participants (Kaholokula, Hayes, Grandinetti, & Chang, 2003). An earlier group of researchers who studied 183 African American participants also found a lack of significance between depression and HbA1c, furthering the questionability of associations between the depression and glycemic control for minority groups (Gary, Crum, Cooper-Patrick, Ford, & Brancati, 2000).

The differences between ethnic groups with regard to the directionality of stress and disease management are evident in qualitative research designs. When African

American veterans, primarily men, with poorly controlled diabetes were studied qualitatively, participants reported trouble managing stress and difficulties with depressed moods (Shacter, Shea, Akhabue, Sablani, & Long, 2009). These patients discussed directionality in their comments, noting these negative psychological factors influenced self-care, which in turn influenced glucose control. Latinas reversed this directionality in one study, reporting the diagnosis of diabetes led to feelings of sadness, anger, and loss of control (Adams, 2003). In a recent study, Mexican Americans with low income levels have also qualitatively reported stress, depression, and fatigue as powerful factors in the self-management process (Clark, Vincent, Zimmer, & Sanchez, 2009). However, these participants reported stress and diabetes to be a bidirectional process, such that stress was thought of as a consequence of having diabetes and leading to difficulty in controlling it. Similarly studied through focus groups, Mexican American participants with diabetes have expressed a desire to have more information about stress management since the lack of information about stress led to more distress (Vincent, Clark, Zimmer, & Sanchez, 2006).

Quantitatively, among Hispanic ethnic minorities, poorer glycemic control has been noted to significantly increase with the severity of depression; however, anxiety was not significantly related to glycemic control (Gross et al., 2005). The increased psychological distress of Hispanic patients diagnosed with type 2 diabetes was worrisome since the majority of participants did not report any mental health services within the prior year (Gross et al., 2005). The absence of mental health services may be partly related to the under-detection of depressive symptoms among underserved populations.

In fact, Bazargan, Bazargan-Hejazi, and Baker (2005) addressed differences between self-perceived and professionally diagnosed conditions among ethnic minorities, finding that depression was the most common condition not detected by physicians among patients with chronic conditions. Attempting to understand why, researchers concluded in a recent review that under-recognition of depression was related to differences in language, barriers to health literacy, somatic complaints, and cultural expressions of distress (Lewis-Fernandez, Das, Alfonso, Weissman, & Olfson, 2005). This may also relate to racial disparities since African Americans with diabetes have qualitatively reported less positive healthcare experiences, poor access, and poor relationships with providers, whereas Caucasian groups did not identify this theme (Shacter et al., 2009). Specifically related to depression, African Americans with diabetes were significantly less likely to have discussed depression with their primary care physician, taken antidepressant medication, or seen a psychiatric provider when compared to Caucasian participants; interestingly, no difference existed in discussions of depression with family, friends, or clergy, which may speak to the disparity in health care (Wagner, Perkins, Piette, Lipton, & Aikens, 2009).

In an effort to find out exactly what impact depression has on populations with and without diabetes, researchers expanded the association between diabetes and other co-morbid conditions when they analyzed 27 studies, finding significant associations between depression and a number of diabetes complications, including retinopathy, nephropathy, neuropathy, macrovascular complications, and sexual dysfunction (De Groot, Anderson, Freedland, Clouse, & Lustman, 2001). However, only a small to moderate effect sizes were noted. These reported complications may relate to problems with self-care, less adherence to medication or diet, and higher health care costs, which have been found in those with higher levels of depression, ultimately leading to increased risk of mortality (Ciechanowski, Katon, & Russo, 2000; Katon et al., 2005; Lin et al., 2004). Some possible underserved groups, including elders (Ciechanowski et al, 2000) and minorities, African American and Asian American individuals (Katon et al., 2005; Lin et al., 2004), were included to some degree in these investigations, although these individuals only composed a small percentage of the sample. These few minority subgroups studied, paired with three-quarters reporting college education and no available socioeconomic data, blur the understanding of what may be generalizable to the larger underserved population. Nevertheless, some of these findings have been confirmed among Mexican American participants, showing the interaction of depression and diabetes predicted greater mortality, complications, and difficulty in activities of daily living (Black, Markides, & Ray, 2003).

Despite the growing body of research documenting a link between depressive symptoms and hyperglycemia, less data exists charting the contributors to depression for those with type 2 diabetes. In their study incorporating an 18% minority sample, Sacco et al. (2005) found adherence to self-care activities, BMI, and self-efficacy were significant independent predictors of depression. In addition, mediation analysis revealed self-efficacy mediated the relationship between adherence and depression and for BMI and depression. It is unclear whether this finding may be entirely applicable for health disparate groups as separate analysis did not occur for these participants. However, some recent researchers have specifically explored contributors to depression and HbA1c using structural equation modeling. When rural, socioeconomically disadvantaged African Americans with diabetes were studied, economic distress, educational attainment, and community disadvantage significantly impact HbA1c through depressive symptoms (Kogan, Brody, & Chen, 2009).

Recent researchers have expanded the narrow focus on depression by exploring other predictors of HbA1c, including locus of control, self-efficacy, and outcome expectancy (O'Hea et al., 2009). O'Hea et al. studied a mostly African American cohort from a medically and socially underserved area of Louisiana. Using hierarchical regression analysis, their model incorporating multiple variables (age, sex, race, outcome expectancy, internal locus of control, and self-efficacy) accounted for 41.2% of the variance in HbA1c. After exploring interaction effects, researchers concluded that internal locus of control may assist in diabetes management for those participants with lower self-efficacy (i.e., confidence in ability to follow recommendations) and lower outcome expectancy (i.e., probability that making changes will help).

Others have used a biopsychosocial model when studying individual glycemic control with type 1 and type 2 diabetes, including stress, coping, and regimen adherence (Peyrot, McMurray, & Kruger, 1999). Interestingly, only self-control and BMI were significantly related to glycemic control for participants with type 2 diabetes, but the relationship of coping to glycemic control was significant when stress and adherence to the diabetes regimen were controlled. While the percentage of underserved participants included in the study was unclear, and a considerable percentage of the sample reported having a college education, this article was included since it was the only manuscript where the authors used the term “biopsychosocial” paired with “glycemic control” in the title. However, findings may not be entirely generalizable to underserved groups given the lack of demographic information provided for the reader beyond education, age, and sex.

Another research team looked at diabetes management and psychological well-being from a comprehensive perspective. Samuel-Hodge et al. (2000) qualitatively studied 70 African American women with type 2 diabetes to assess influences on their day to day management of their disease. Focus groups revealed that serving in the “multi-caregiver role” or taking responsibility for providing emotional or tangible support for family, friends, and others was a consistent theme. While this theme did not specifically point to depressive symptomatology for this minority group, it may be an important contributing variable associated with increased psychological co-morbidities, as participants described themselves as tired, stressed, and pressured from their caretaking responsibilities. Serving as a constant caregiver may also be considered a characteristic of social influences on disease management, which might include immediate family, cultural, or communal factors.

Many of the above mentioned researchers have begun to explore differences in the presence or experience of co-morbid depression and diabetes according to demographics. It seems that certain populations may be more at risk for the depression-diabetes link. Researchers have found a number of demographic correlates of co-morbid depression, including those who were younger, female, minorities, less educated, smokers, unmarried, insulin users, and with greater medical co-morbidities or complications (Katon et al., 2004; Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). A number of characteristics of the underserved, such as lower educational levels, functional impact, and financial stress, were significant predictors of depression as well (Bell et al., 2005; Fisher, Chesla, Mullan, Skaff, & Kanter, 2001).

Other researchers have purposely examined differences according to ethnicity or sex. Fisher et al. (2004) studied four ethnic groups diagnosed with type 2 diabetes, including European American, Hispanic, African American, and Chinese American participants. The total mean rate of likely clinical depression was 25.9% among their participants and significant differences were found in depressive affect according to ethnicity, such that Chinese American and Hispanic participants had the highest scores while European American and African American participants had the lowest scores of depressive affect. Interestingly, when educational level and income were controlled, differences in depressive affect scores no longer reached statistical significance between any of the ethnicities. In a recent study of women with diabetes, researchers noted urban African American participants expressed significantly higher levels of psychosocial distress and glycemic control, while reporting less social support when compared to rural Caucasian participants (Melkus, Whittemore, & Mitchell, 2009). Of note, almost half of participants had secondary education and some significant baseline differences existed since African American participants had lower incomes, were younger, and the majority were divorced or single. Nevertheless, this research was included since it documents disparity in biopsychosocial functionality between groups.

When differences between the sexes were examined among participants with diabetes, there was no statistically significant difference in depression scores for males and females in any ethnic group (Fisher et al., 2004). Coffman (2008) also found no significant difference in the percentage of depressed men and depressed women (shown 37.2% and 37.5%, respectively). Interestingly, this is contrary to other researchers (Ali et al., 2006; Anderson et al., 2001; Bell et al, 2005; Gross et al., 2005; Katon et al., 2004; Lin et al., 2004) who often cite women with type 2 as being more likely to exhibit depressive symptoms. In addition, low-income women who live alone have been shown to have higher rates of anxiety and self-reported poor to fair physical health when compared to males, those who live with a partner, or those with higher incomes (Gross et al., 2005). One hypothesis is that levels of depression or anxiety for women may relate to serving as the primary caretaker for family or friends, as previously noted (Samuel-Hodge et al., 2000). The findings encapsulated within this theme document the relationships between intrapsychic processes (depression, self-efficacy, anxiety, etc.) and disease management, but do not account for external influences on the person with diabetes, including the role of health care providers, a partner, nuclear or extended family, and the larger system, such as neighborhood or culture.

Marital, Familial, and Environmental Influences

The 16 articles reviewed in this section addressed implications of marital, familial, and other social involvement for diabetes care. Specifically, researchers have examined the following areas: the role of health care providers, the role of relationships within the nuclear family system, and the role of relationships and larger societal interactions occurring outside the nuclear family system. Each of these areas is detailed throughout this subsection.

Researchers have found that social support may be derived from multiple sources; for instance, researchers studying African Americans and Hispanic patients found physicians, nurses, or health care professionals were often identified as primary supports, along with spouses or other family members (Glesson-Kreig, Bernal, & Woolley, 2002; Tang, Brown, Funnell, & Anderson., 2008). When provider support was examined for a low income, ethnically diverse sample of 956 patients, approximately 87% of the sample reported positive feelings about the level of support given by their provider (Greene & Yedidia, 2005). This may be an important factor since higher patient trust in their physicians was also predictive of lower levels of hassle with the disease, enhanced ability to complete recommended care plans, and improved capability to care for diabetes in general in another investigation (Bonds et al., 2004).

Beyond supportive behaviors at the provider-patient level, researchers are beginning to understand the role of family in diabetes care. Coffman found older Hispanic adults were more likely to report family members, including spouse or relative, as the primary source of support, especially with regard to tangible aid, such as shopping, running errands, or talking with health care providers. Tangible types of support (transportation and language interpretation) from family were previously noted as the most satisfactory and needed among a group of 95 Hispanic adults (Gleeson-Kreig et al., 2002). Conversely, low-income Mexican Americans with diabetes have reported management of relationships and living in a multiple person household, especially during economically difficult times, as primary areas of stress (Clark et al., 2009).

When investigating the nuclear family system further, researchers have documented the implications of couple dynamics for diabetes care among elderly Medicare beneficiaries in underserved areas (Trief, Morin, Izquierdo, Teresi, Starren, et al., 2006). Of note, sample composition included both type 1 and type 2 participants taking insulin, which limits generalizability to those taking oral medication or managing their illness through diet and exercise alone. Higher marital stress was positively correlated with poorer blood glucose control, while marital cohesion and marital satisfaction were negatively correlated with blood glucose control. Psychosocially, greater marital stress and lower marital satisfaction were also correlated with individual psychological health, increased depression, and distress related to diabetes. These findings only demonstrated a weak relationship, whereas other researchers have examined these associations, finding stronger correlations (Tang et al., 2008). Specifically, Tang et al. found among 89 African Americans participants aged 40 and older with type 2 diabetes that negative support behavior was related to not taking medication as prescribed by the health care provider, while satisfaction with social support was significantly related to improved quality of life and monitoring of blood glucose.

Qualitative inquiry methods, such as the use of focus groups, have been used to document the role of spousal support in other diabetes self-care activities, including dietary behavior change (Beverly, Miller, & Wray, 2008). Beverly et al. found among middle-aged to older adults living with diabetes that a number of relational themes were highlighted as important to diabetes care. These themes included navigating control over food decisions, incorporating diabetes discussions into daily conversations, and coping communally with the disease. When food-related behavior change was studied by another group of researchers, regression analysis revealed positive support behaviors among African American participants were significantly predictive of following a healthy eating plan (Tang et al., 2008). Conversely, recent researchers found family and friend support among 164 African American and Latino participants only increased the odds of glucose monitoring, but not other self management behaviors, such as adhering to meal plans, taking medications, engaging in physical activity, or checking feet (Rosland et al., 2008). However, meal plan adherence and foot checking were associated with support from a non-physician health care professional. Beyond the broad influence of providers, partners, or family members, past researchers have specifically investigated the helpful or unhelpful aspects of family involvement in diabetes care (e.g., Chesla et al., 2003, 2004; Fisher et al., 2000; Weiler & Crist, 2009).

The family process literature includes investigations of family conflict, cohesiveness, and coherence. Chesla et al. (2003) found that elevated levels of unresolved conflict within the family predicted negative changes in diabetes management over a one year period for Latino and European American participants. Specific to Latino families, higher levels of structure and organization, traditional gender roles, and optimistic beliefs contributed to better disease management (Fisher et al., 2000). Family cohesion recently emerged as one important theme in the Latino social environment when participants were qualitatively studied through semistructured interviews (Weiler & Crist, 2009). These researchers noted family, whether immediate or extended, was important for the monitoring of diabetes management tasks (e.g., reminders, encouragement, advice, etc.). When aspects of family life and diabetes management were studied for African American participants, family structure (i.e., roles and rules), world view (i.e., assumptions and beliefs), and emotional management (i.e., expression and management of emotions) were significantly associated with patient morale (Chesla et al., 2004). Furthermore, structural togetherness was significantly related to quality of life, while the family's world view of meaningfulness and manageability were significantly positively associated with general health for the individual with diabetes. For African American participants, unresolved conflict was related to psychological symptoms of depression. Interestingly, Chesla et al. (2004) did not find an association between family measures and HbA1c, which may mean that the complexities of glycemic management cannot be explained by social variables alone; instead diet, exercise, psychological status, BMI, among other constructs may need to be incorporated into the analyses.

While past family process literature is valuable in highlighting the systems' role in shaping diabetes management for populations who may meet one parameter of the definition for underserved for this review, caution may be advised in generalizing some of the results to underserved groups. For instance, the mean age of 66.7 classifies Beverly et al.'s (2008) sample within the elderly subgroup; however, the mean education reported was college and no socioeconomic or ethnic group data were reported. Some samples included minority participants with an average of 14 years of education and average annual incomes of $40,000 (Chesla et al., 2004). While these researchers were studying populations that fit a health disparity classification, their educational level, socioeconomic status, and/or other resources may not have led them to be underserved in accessing services. Nevertheless, the paucity of literature related to family support in health behaviors among the underserved required extrapolation of literature from other studies, even when the clarity of “underserved” may have been incomplete.

Research has extended beyond nuclear family involvement to include the social influences of organizations, neighborhoods, and larger social perceptions. Bertera (2003) investigated social support among a variety of ethnic groups (i.e., African American, Mexican American, and Caucasian adults) aged 60 and older among three groups, those who had a diagnosis of diabetes, those who were unaware of elevated serum glucose, and those who did not have a formal diagnosis of diabetes. In her sample, higher means of social support for African American and Caucasian groups compared to Mexican American groups were related to weekly telephone calls with family and friends, annual visits with friends and relatives, and annual attendance of club meetings; whereas, Mexican Americans reported higher means of church attendance per year. Elderly (≥ 70) diabetes patients in another study showed benefits from community supports, reporting lower symptoms of depression, stress, bad days, and impairments in activities of daily living in the short term (Zhang, Norris, Gregg, & Beckles, 2007). Social support from family, friends, community organizations, neighborhood, and other resources have also been shown to significantly predict adherence to diabetes self-care behaviors for underserved communities, both rural and urban (Shaw, Gallant, Riley-Jacome, &

Spokane, 2006). However, interface with society may not always be positive, as one group of Latinos reported feelings of denial and embarrassment related to social stigma of being diabetic and perceiving themselves as being defined as “sick” in one qualitative study (Weiler & Crist, 2009).

While these findings helped to illuminate the role of social factors in patients’ lives, there are a number of limitations, including non-minority samples, as 80 to 86.1% were Caucasian (Bertera, 2003; Zhang et al., 2007). Additionally, researchers included participants who were unaware of their diabetes diagnosis and/or who were in the pre-diabetes phase, which also may limit applicability of the findings (Bertera, 2003). A last limitation was the use of the number of phone calls, visits, or meetings to define social support. It may be inappropriate to assume presence of personal contact might result in perceived social support; for instance, that visits with neighbors led to more emotional support delivered. Reflecting on these limitations, future researchers should include proportionate amounts of minority, underserved groups and purposefully ask about perceived and actual support.

Beyond ethnic group classifications, some researchers have explored the role of sex in perceived social support. In one study of 89 African American participants over the age of 40, Tang et al. (2008) found men and married participants reported receiving significantly greater amounts of support than women or those who were unmarried. Specifically, men reported receiving significantly more positive support behaviors and greater satisfaction with support when compared to women. The trend for men to receive greater levels of social support when compared to women is consistent when considered with psychological findings from the first theme, which cite women as more likely to experience depressive symptoms when compared to their male counterparts (Gross et al., 2005; Katon et al., 2004). Researchers' findings within this theme included the array of social factors that contribute to improved or declining functionality for the patient with diabetes. Utilization of existential supports, such as a higher power or personal beliefs, are additional influences that may shape the way individuals care for their diabetes and overall health.

Spiritual Influences

Of the nine research studies included in this theme, the spirituality literature predominately consisted of African American samples with type 2 diabetes, with less data pertaining to other underserved populations or ethnic groups. Interesting to this theme are the designs used to conduct the studies. For example, five research teams used qualitative methodologies to explore spirituality's role in biomedical or psychosocial health, which may relate to the abstract nature of spirituality and religiosity; whereas three researchers opted for quantitative approaches. Also, one previous review article was included.

When demographics, BMI, and medications were held constant for African American participants with diabetes, religious and spiritual well-being accounted for a significant amount of variance in HbA1c (Newlin, Melkus, Tappen, Chyun, & Koenig, 2008). Diabetes-specific emotional distress partially mediated the relationships between this existential well-being and HbA1c. Otherwise, emotional distress or social support did not act as mediators in the relationships of religiosity or spirituality to glycemic control.

Additionally, researchers have qualitatively explored spirituality for African American groups, finding religion and church as important tools for coping, socialization, and improved life satisfaction (Samuel-Hodge et al., 2000); unfortunately, missing from the discussion was demographic data on participants beyond race, which limits the ability to conclude the findings are representative of groups that may have limited access to health care resources.

Recently, the research landscape for spirituality has been expanded for African American patients with diabetes (Polzer, 2007; Polzer & Miles, 2005, 2007). Polzer and Miles began inquiry into African American populations' use of spirituality through a literature review published in 2005. Her review of 55 articles and five books relevant to health and spirituality for the chronically ill revealed African Americans often turn to God for help with coping and/or relinquish control of health to God. Her review supported spirituality as both a positive and negative manipulator of self-management depending on how a patient used faith. Due to the influence of spirituality for this minority population, she stated providers "must go beyond asking questions about religious preference and church attendance and, therefore, incorporate a more comprehensive spiritual assessment" (p. 241). Polzer and Miles did just this in 2007, by exploring spirituality and self-management among low-income African Americans using a grounded theory approach. Using minimally structured interviews, researchers found participants viewed spirituality in unique ways. Interestingly, they highlighted three distinct groups, use of God in the background, forefront, and as a healer. Each of these groups differed in how they conceptualized the role of God and health care providers within their care.

While the distinction between groups was helpful in clarifying the spirituality of African Americans with diabetes and their health behaviors, it is important to note that these studies (Polzer, 2007; Polzer & Miles, 2007) only reflect the perspectives of 29 middle aged to older aged participants. Thus, the perspectives of the growing number of African American people younger than 40 with type 2 diabetes, not to mention other races or ethnic groups, were not represented in these distinct spirituality groups. Methodologically, the majority of the researchers used qualitative inquiry in studying the role of spirituality; thus, future quantitative research might assist in further understanding spirituality's role as a mediating variable or key factor in disease management.

Some literature has been used to compare differences or similarities in use of spirituality among ethnic groups. When African American primary care patients with type 2 diabetes were quantitatively compared to Caucasian counterparts using a cross sectional survey, African Americans were more likely than Caucasians to rank spirituality as important in their depression care (Cooper et al., 2001). Those items rated highly tended to be related to overall spirituality (e.g., faith in God, asking God for forgiveness, prayer) and had less to do with public religiosity, such as church attendance. Since Cooper et al.'s sample included numerous young, educated participants; these comparative findings might be dissimilar if duplicated for underserved populations of similar races.

Though the above mentioned researchers have not included demographic or descriptive data citing the underserved nature of their samples, some researchers have explicitly studied underserved minority groups. Zaldivar and Smolowitz (1994) included in their sample 104 predominately Medicaid insured individuals who had a mean education of fifth grade, and were originally from the Dominican Republic, Puerto Rico, Cuba, or Ecuador. The researchers used a self-report survey, revealing 78% of their sample believed they had diabetes due to God's will. Another 17% used herbal treatments for their condition. Further exploration of alternative treatments in Mexican American populations revealed many used these treatments as an adjunctive resource, not replacement, to traditional medical treatment (Hunt Arar, & Akana, 2000). In fact, none had used curanderos or traditional healers, but instead relied on personal prayer to combat stress and anxiety. Adams confirmed in a qualitative study that Latinas with diabetes use religion as a vital lifeline for coping and generating hope. In summarizing the literature dedicated to this dimension, it seems "unique" might be an appropriate word to describe the utilization of religiosity and spirituality in diabetes or psychological care, as participants incorporated faith in distinctive ways.

Implications for Research and Practice

We believe three recommendations follow from our critical review of the available research: 1) further exploration of the relationship between psychosocial-spiritual influences on diabetes management for uniquely underserved groups; 2) investigation of demographic differences or similarities with regard to diabetes; and 3) development and use of clinical models incorporating a multidisciplinary, collaborative stance in addressing diabetes for vulnerable populations.

Psychosocial-spiritual influences among underserved. Future research is needed to specifically target populations that meet multiple parameters of the United States Department of Health and Human Services' (1998, 2000) definitions of underserved and health disparate individuals, since many previous researchers did not exclusively study these groups. For instance, while data are available to support the influence of depression on worse glycemic control, poorer diabetes outcomes, and mortality (Ali et al., 2006; Black, Markides, & Ray, 2003; De Groot et al., 2001; Gross et al., 2005; Katon et al., 2005; Lin et al., 2004; Lustman et al., 2000), many of these samples included individuals with type 1 diabetes and/or a larger proportion of non-underserved groups. Others did not report socioeconomic, educational, or insurance data (Ali et al., 2006; Lin et al., 2004; Samuel-Hodge et al., 2000). Pertaining to ethnic diversity in sample composition, numerous researchers have studied mostly Caucasian participants (Bertera, 2003; Katon et al., 2005; Sacco et al., 2005; Zhang et al., 2007), though this group is not the most impacted by this chronic illness (CDC, 2008). Incorporation of more extensive demographic data (e.g., income, educational level, insurance status, marital status, access to care, and ethnicity) may help to increase cultural sensitivity in the study and application of diabetes research. This may be particularly important given inconsistent findings. That is, some researchers have explicitly studied African American and elderly underserved groups, finding minimal to no association between depression and glycemic control (Gary et al., 2000; Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). If an association is confirmed, more data are needed to address the directionality of this relationship as qualitative investigators have found unique trends in directionality among ethnic groups when depression or stress and diabetes have been discussed (Adams, 2003; Clark et al., 2009; Shacter et al., 2009).

Beyond psychological influences, this recommendation for greater demographic clarity would also benefit future researchers studying the relationship between social or spiritual factors and disease management. Researchers examining the influence of social support on disease management have found stress and conflict in relationships often results in depression and poorer diabetes management (Chesla et al., 2003, 2004; Trief, Morin, Izquierdo, Teresi, Starren, et al., 2006); though, inclusion of minority populations without further sociodemographic data prevents some generalizability. Spirituality data are further restricted from mostly qualitative methodologies, which is likely related to the abstract nature of personal beliefs or religious practices. Most of our knowledge pertains to African American groups, further limiting the applicability to other populations (Polzer, 2007; Polzer & Miles, 2007; Samuel-Hodge et al., 2000). While some qualitative and quantitative data exists pertaining to spirituality and religious well-being among Latino groups (Adams, 2003; Hunt et al., 2000; Newlin et al., 2008; Zaldivar & Smolowitz, 1994), the limited diversity in methodology and sample composition alongside the scarcity of research for the underserved calls for more inquiry in this area.

Demographic differences or similarities. Building upon the current knowledge is only a first step, as future researchers would benefit from documenting differences or similarities according to subgroups within underserved populations. Specifically, likeness and dissimilarities surrounding experiences of depressive symptoms and other psychological distress, utilization of supporters, and significance of spirituality in medical or psychological care would add to our present understanding of the distinctiveness among groups. When exploring the psychological influences on diabetes management, a number of researchers have identified differences due to ethnic group, sex, and/or marital status among the underserved (e.g., Coffman, 2008; Cooper et al., 2001; Fisher et al., 2001, 2004; Katon et al., 2004; Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006).

Researchers noted a number of underserved characteristics (e.g., minority status, lower education, and financial stress) have been linked to a greater risk of co-morbid depression (Bell et al., 2005; Fisher et al., 2001; Katon et al., 2004; Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). Interestingly, in one investigation, ethnic differences disappeared when educational level and socioeconomic status were controlled (Fisher et al., 2004). Sex differences tended to be inconsistent since some researchers show no differences for depressive symptoms in the sexes (Coffman, 2008; Fisher et al., 2004), while others cite women as having greater depressive symptoms (Gross, et al., 2005; Katon et al., 2004). These contradictory findings call for further exploration into how men and women uniquely or similarly experience the biopsychosocial-spiritual aspects of diabetes.

Socially, Tang et al. found men reported significantly higher levels of support than women. As would be expected, married individuals reported more support than those who are unmarried (Tang et al., 2008). Explorations of ethnic group differences revealed that African American and Caucasian participants reported higher levels of support when compared to Mexican American participants (Bertera, 2003). African American participants also were more likely than others to rank spirituality as important to diabetes care (Cooper et al., 2001). The scarcity of social and spiritual data between groups necessitates further documentation of the unique influence of social or existential factors on functionality.

Collaborative practice. This practice-based implication is influenced by the ADA's (2010) recently released standards, which specifically recommended assessment, screening, and integration of psychosocial factors into diabetes care. Since it may be overwhelming for any one provider to manage multidimensional needs independently, team-based care is one strategy to improve patient functioning. In fact, the Institute of Medicine (2001) suggested treatment of the chronically ill should be a collaborative endeavor. This may be particularly relevant given the findings from this review, especially the difficulty of addressing psychological needs within traditional medical care. Past researchers have noted poor access to mental health services (Gross et al., 2005) and underdetection of depressive symptoms by medical providers (Bazargan et al., 2005); thus, integration of mental health services into traditional care may improve access, screening, and treatment of psychiatric symptoms, consequently reducing many of the complications (De Groot et al., 2001) or problems with activities of daily living (Black et al., 2003) experienced by patients with psychological comorbidities, such as depression.

Beyond multidisciplinary team-based care models, others have emphasized the inclusion of the patient and family as necessary collaborators, whereby they become partners or stakeholders in care versus mere consumers (Doherty & Mendenhall, 2006; Mendenhall & Doherty, 2003). By inviting the patient’s viewpoint, providers might enhance internal locus of control, thereby improving self-efficacy, outcome expectancy, or disease management (Ohea et al., 2009). Assessments of personal beliefs or spiritual assessments are one way to invite the patient’s perception of the chronic illness and treatment plan (Polzer & Miles, 2005). Inclusion of family members into treatment may also be useful, especially when the focus is on increasing tangible support (Gleeson-Kreig et al., 2002), resolving family conflict (Chesla et al., 2003), and improving structure and organization within the family system (Chesla et al., 2004; Fisher et al., 2000). Involvement of family and friends has been shown to increase the odds of glucose monitoring (Rosland et al., 2008), while family alone have been cited by some patients as helpful in diabetes management (Weiler & Crist, 2009).

Research evaluating the effectiveness of these teams or programs would add to the landscape of literature. Lin et al. (2004) suggested using data to evaluate the integration of depression screening into diabetes care programs to improve patient outcomes. Evaluation data examining the impact of collaborative teams or comprehensive intervention protocols might assist in developing best practice, as well. When working together, these multidisciplinary teams would benefit from understanding the unique needs, challenges, and strengths of underserved patients, which may promote better patient/family-provider relationships. By enacting programs and research valuing culture and comprehensive health, the biopsychosocial-spiritual needs of underserved patients would have a greater likelihood of being validated and addressed.

Conclusion

As the prevalence of diabetes continues to increase, especially among underserved groups, providers and researchers might benefit from consideration of psychosocial, spiritual, and quality factors that influence disease management. In grasping the unique needs of the underserved, researchers and clinicians would also benefit from understanding commonalities and differences according to ethnic group, age, gender, among other constructs. By studying the interplay of these dimensions for various groups, researchers can initiate appropriate programs that capture the many influences on diabetes health. Ultimately, looking toward the future, research should be pursued using an inclusive, patient-centered lens. With the current state of diabetes in our country, developing a comprehensive understanding of underserved individuals with type 2 diabetes is not only important, but essential. By doing so, researchers and clinicians might build upon the current knowledge to combat the diabetes epidemic in our country.

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RUNNING HEAD: Underserved Patients with Diabetes

Satisfaction with Life and Psychosocial Factors among Ethnic Minorities with Type 2 Diabetes

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Abstract

The objective of this study was to examine the association between biomedical markers of disease management and psychosocial constructs, as well assess the correlates and predictors of variability for satisfaction with life (SWL) among African American and Hispanic patients with uncontrolled type 2 diabetes. Data were collected from 142 patients during their first visit within a collaborative care program. Pearson product moment correlations, multiple linear regression, and one-way analysis of variance were used to examine research questions in this descriptive, quantitative study. Only one weak, significant relationship was noted for BMI and somatization; otherwise, no noteworthy relationships were documented between psychosocial-spiritual and biomedical constructs. Psychological distress, social support, and spirituality accounted for twice the amount of variance in SWL for African American participants compared to Hispanic participants. Social support was the strongest predictor of SWL for African American participants, while psychological distress was the strongest predictor of SWL for Hispanic participants. Social support moderated the relationship between psychological distress and SWL for Hispanic participants, but not African American participants. Spirituality did not moderate the relationship for either ethnic group. Clinicians and researchers who work with and study minority patients with uncontrolled type 2 diabetes may see improvement in patients' SWL when screening for and treating psychological distress, interpersonal strain, and existential struggles. An understanding of ethnic group differences is important since some dissimilarity among groups existed.

Key words: diabetes, minority, satisfaction with life, psychosocial, spiritual

Chapter Two: Research Article

The most recent epidemiological evidence from the Center for Disease Control (CDC, 2008) has indicated approximately 17.9 million individuals in the United States have diabetes while a staggering 5.7 million are likely undiagnosed. Type 2 diabetes comprises 90 to 95% of cases among the adult population (CDC, 2008). Looking forward, the National Health Interview Survey and the Bureau of Census population demographic projections suggest the burden of diabetes is estimated to reach 29 million cases by 2050 (Boyle et al., 2001). Beyond our borders, the World Health Organization (WHO, 2009) estimated over 220 million individuals in the world have diabetes and deaths from the disease are expected to double by 2030. Typically, management of this chronic illness is through the general goal of maintaining a HbA1c or glycated hemoglobin of < 7.0% unless patients have a history of significant co-morbidities and/or longstanding diabetes (American Diabetes Association [ADA], 2010); however, recent researchers and clinicians have incorporated quality of life (QOL) as an important measure of health.

Quality of Life

When studying QOL, researchers have focused on two distinct, but related concepts: health-related quality of life (HRQOL) and satisfaction with life (SWL). HRQOL is often measured by how an individual's perceived physical or mental health influences his or her daily functionality (CDC, 2009), while the associated construct of SWL is "a cognitive-judgmental process of a comparison of one's circumstances with what is thought to be an appropriate standard set by each individual for himself or herself regarding an overall evaluation of life" (Diener, Emmons, Larsen, & Griffin, 1985, p. 71). In other words, are individuals broadly content with their lives compared to their personally imposed standards, which may or may not directly involve health? To date, most researchers have focused on HRQOL, while fewer have studied SWL. This greater focus on HRQOL may relate to researchers' interest in participants' present functionality instead of their broader appraisals of life, which better characterizes SWL.

When studying demographic relationships and HRQOL, individuals with diabetes reporting a lower QOL were often less educated, lower income, older, female, and of lower socioeconomic status (Glasgow, Ruggiero, Eakin, Dryfoos, & Chobanian, 1997; Wexler et al., 2006). Some significant differences were noted in the expression of HRQOL when investigating ethnicity, such that Hispanic respondents were most burdened by their diet while African American respondents were most burdened by inflexibilities in leisure time (Misra & Lager, 2009). Participants who tried to maintain multiple healthy lifestyle habits (e.g., adequate physical activity, consuming necessary servings of fruits or vegetables, and not smoking) were less likely than those without healthy lifestyle habits to report worse physical or mental health days associated with HRQOL (Li, Ford, Mokdad, Jiles, & Giles, 2007). Others have noted metabolic control as predictive of improved HRQOL among a low income, somewhat diverse sample (Camacho et al., 2002). Conversely, the presence of diabetes complications, insulin use, limited physical activity, and co-morbid illness (e.g., depression, obesity, stroke, heart failure) were significantly associated with and/or predictive of lower HRQOL (Glasgow et al., 1997; Wexler et al., 2006). Researchers studying the ethnic differences among the comorbidity of depression found ethnicity moderated the relationship between depressive symptoms and HRQOL (Kaholokula, Haynes, Grandinetti, & Chang, 2006). Interestingly, while the measure of HRQOL seems to fluctuate with a worse physical health, SWL seems to be less malleable (Grigg, Thommasen, Tildesley, & Michalos, 2006). Grigg et al. found participants with diabetes may have lower self-related health, but this did not seem to impact global appraisals of SWL. While countless researchers have explored HRQOL among diabetics, the above investigators were the only researchers noted to specifically study the concept of SWL among type 2 diabetes patients.

While there is a paucity of SWL data for those with type 2 diabetes, some research is available for the intersection of demographics or psychosocial constructs and SWL among participants with other diagnoses. Among a hemodialysis sample of mostly African American participants, SWL scores correlated with older age, level of social support, presence of a relationship, and severity of illness (Kimmel et al., 1995). Kimmel et al. stated, “It is important to measure several dimensions of QOL and variables that influence QOL, such as social support and relationship satisfaction” (p. 1425). Adding upon this, later researchers found religiosity, specifically religious beliefs more so than religious activity, was most highly correlated with SWL among a comparable, mostly African American sample of patients receiving hemodialysis (Berman et al., 2004). Less direct literature is available for SWL among individuals with type 2 diabetes; thus, to expand our understanding, it will be important for researchers to incorporate known psychosocial constructs into the conceptualizations of SWL for individuals with type 2 diabetes. This may be particularly true for minority groups since a number of the above mentioned researchers incorporated mostly non-Hispanic white samples (Glasgow et al., 1997; Li et al., 2007; Wexler et al., 2006). While not studied as directly related to SWL for patients with diabetes, a number of research findings exist pertaining to psychosocial or spiritual determinants of disease management or comprehensive health.

Psychosocial and Spiritual Determinants

Researchers have offered a foundational understanding of the interrelatedness of psychological health, especially depression and glycemic control. In general, evidence from a number of meta-analyses have documented higher rates of depression among patients with type 2 diabetes when compared to nondiabetics, which was consequently associated with hyperglycemia and greater complications (Ali, Stone, Peters, Davies, & Khunti, 2006; Anderson, Freedland, Clouse, & Lustman, 2001; De Groot, Anderson, Freedland, Clouse, & Lustman, 2001; Lustman et al., 2000). However, consensus has not been reached in the literature, especially among ethnic minorities or underserved groups. For instance, among an elderly, ethnically diverse sample, an initial relationship between depression and HbA1c was no longer predictive when examined prospectively (Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). Additionally, another group of researchers found only marginal associations between depressive symptoms and HbA1c among a sample of African American participants (Gary, Crum, Cooper-Patrick, Ford, & Brancati, 2000). Additionally, researchers using meta-analyses noted only small to moderate effect sizes between the presence of depression with diabetes complications or poor glycemic control (De Groot et al., 2001; Lustman et al., 2000). Perhaps the association between mood status and disease management or subjective well-being remains unclear for some groups due to other factors, such as social or existential experiences.

Since individuals with diabetes do not exist in a vacuum, but live within broader systems, recent researchers have begun to examine the impact of social dimensions, such as spousal relationships, family interactions, and larger cultural experiences as noteworthy factors. Among a group of elderly Medicare beneficiaries in a medically underserved area, higher marital stress was found to have a weak, significant relationship with poorer blood glucose control and stronger positive correlation with depression (Trief, Morin, Izquierdo, Teresi, Starren, et al., 2006). Conflict within the family system may have a similar effect since elevated levels of unresolved conflict predicted negative changes in diabetes management in a sample of Hispanic and European Americans (Chesla et al., 2003). On the contrary, structural togetherness within the family system has been positively related to diabetes QOL, while a meaningful view of the world has been positively associated with diabetes QOL and health (Chesla et al, 2004). Indeed, satisfaction with supports was again confirmed as predictive of diabetes-specific QOL among a sample of African Americans with type 2 diabetes (Tang, Brown, Funnell, & Anderson, 2008; Trief, Morin, Izquierdo, Teresi, Starren, et al. 2006). While social support seems to directly impact disease management and QOL as it pertains to daily living with diabetes, less is directly known for how family, friends, or other supports impact SWL.

For some individuals, support extends beyond tangible sources toward existential ways of life. Polzer and Miles (2007) found that African American participants' spiritual beliefs were strongly tied to how they view God, themselves, or their medical provider in healing or treatment. The use of spirituality seemed to impact psychosocial health among some groups as well, as African American women in one qualitative analysis described God and church as important for coping and socialization (Samuel-Hodge et al., 2000). Additionally, association with a church was specifically acknowledged as a venue to advance life satisfaction through peer or pastoral emotional support. For Hispanic participants, up to 78% of participants in one study reported having diabetes due to God's will (Zaldivar & Smolowitz, 1994) and others described a reliance on prayer to combat stress and anxiety (Hunt, Arar, & Akana, 2000). Thus, it seems spirituality is an integral construct in treatment and psychosocial health for some minority groups.

The aim of the present descriptive study was to survey an underserved, rural population of African American and Hispanic minority groups with type 2 diabetes to document trends, similarities, or differences in psychosocial health and overall subjective well-being, using the construct of SWL. This seemed especially imperative since much of the past literature has centered on mostly non-minority cohorts or HRQOL (e.g., Glasgow et al., 1997; Li et al., 2007; Wexler et al., 2006). We used a cross-sectional design to explore the following research questions: 1) Are psychosocial or spiritual constructs related to levels of HbA1c and BMI?; 2) How well do depression, psychological distress, social support, and spirituality predict SWL?; 3) Which of the independent variables (depression, psychological distress, social support, and spirituality) are the best predictors of SWL?; and 4) Do spirituality or social support moderate the relationship between psychological distress and SWL?

Research Design and Methods

This descriptive study was conducted among participants identified as having uncontrolled or newly diagnosed type 2 diabetes enrolled in a collaborative care program. *Collaborative* was used to describe the program since health care professionals from multiple disciplines practiced concurrently, communicated frequently, and influenced individual and shared treatment plans. The data analyzed for this study were derived from the initial session surveys administered to all participants who signed the research informed consent. The Institutional Review Board from a southeastern university approved the study protocol prior to the initiation of the research.

The study took place from 2006 to 2009 within a large southeastern community health system serving as a medical home to approximately 30,000 patients annually. Operating as a Federally Qualified Health Center (FQHC), this community healthcare system is composed of four clinics embedded within a rural, socioeconomically deprived area. A number of services are provided for patients and families, including medical, dental, mental health, and community outreach. The chief executive officer reports 86% of patients are Hispanic or African American, nearly 70% of the visits are for patients who have one or more chronic conditions, and 80% have no health insurance. In fact, all but 1% of patients served through these clinics have incomes below the federal poverty line. A large percentage of patients are consistently mobile geographically from employment as seasonal farm workers and many speak Spanish as their primary language.

Patients were referred by their health care provider for enrollment into the collaborative care program if they met the following inclusion criteria: 1) adults ages 18 and older, 2) hemoglobin $A_{1C} \geq 7.0$, and 3) receipt of primary care services from the community health system. Exclusion criteria were: 1) Individuals who were cognitively impaired and/or who had psychotic symptoms and/or who had a terminal illness, and 2) individuals receiving diabetes health education and/or mental health services elsewhere.

After referral to this collaborative care program, participants were scheduled for an initial session where they completed an Informed Consent document and assessment packet taking 30-45 minutes to complete. This investigation centered on both African American and Hispanic patients. While Caucasian groups also participated in the research, the sample size was too small for analyses. Measures were available in Spanish for participants who did not speak or read fluently in English. All instruments were read by the primary researcher or therapist to participants, ensuring comprehension of content and sensitivity to literacy. Careful attention was paid to selecting assessment instruments that were validated for use with minority and underserved populations.

Measures

Questionnaires were used to assess four domains: psychological health, perceived social support, spirituality, and SWL. Some information was accessed via participants' electronic medical records (EMR), including sex, ethnicity, age, and biomedical markers of disease management. Additionally, a form was developed during data collection to gather further demographic data from participants, including yearly household income; consequently, this data was accessible only for those participants surveyed after the creation of the form. Biomedical markers, body mass index (BMI) and HbA1c, were collected from each participant and entered into or were obtained from their EMR. Participants' height and weight were obtained to compute their updated BMI. All participants were asked to remove any coats or bags for this process to ensure accuracy. The most recent HbA1c was acquired from the laboratory results portion of their EMR.

Psychological health. Two measures were used to assess psychological health. Depression was measured using the Patient Health Questionnaire (PHQ; Kroenke, Spitzer, & Williams, 2001) and psychological distress using the Brief Symptom Inventory (BSI; Derogatis, 2001). For our purposes, the PHQ-8 was used instead of the PHQ-9 since the BSI assessed suicidal ideation. The PHQ-8 included all questions from the PHQ-9 except the item used to assess for thoughts of self harm and removal of this item was acceptable (Kroenke & Spitzer, 2002). Similar to the PHQ-9, the PHQ-8 included an additional question to assess how problems influenced daily activities (i.e., work, things at home, getting along with others). When the PHQ-8 and PHQ-9 were compared for sensitivity, specificity, and positive predictive value, the instruments operated similarly. Data on reliability and validity was mostly represented for the PHQ-9. Inquiry into the psychometrics has shown a Cronbach's alpha coefficient of .86 to .89, excellent test-retest reliability, and a strong correlation (*r* = .84) between PHQ scores and mental health professional validation interviews (Kroenke et al., 2001). When assessing criterion validity, sensitivity scores ranged from 68% to 95% and specificity scores ranged from 84% to 95% (Kroenke et al., 2001). The second measure, BSI-18, is an instrument that results in a global severity index or total psychological distress score (Derogatis, 2001). The instrument offered three subscales as well, including depression, anxiety, and somatization. Participants rated their level of distress on 18 items over the last seven days, using a Likert scale from zero to four. Psychometric exploration for the BSI-18 revealed a Cronbach's alpha of .89 (Derogatis, 2001).

Social support and spirituality. Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) and spiritual experiences were measured using the Daily Spiritual Experiences Scale (DSES; Underwood & Teresi, 2002). The MSPSS included a total level of perceived social support score and three subscale scores (i.e., significant other, family, and friends) derived from 12 items (Zimet et al., 1988). The MSPSS has a Likert scale ranging from one to seven. The MSPSS has shown a high Cronbach's coefficient alphas for each subscale, ranging from .85 to .91. The DSES is a 16 item scale used to "measure experience rather than particular beliefs or behaviors; therefore, items are intended to transcend the boundaries of any particular religion" (Underwood & Teresi, 2002, p. 23). The first 15 items used a Likert scale ranging from zero to five. Participants were asked to consider how often they directly had particular spiritual experiences. The final item asked participants how close they felt to God or relevant higher power. The DSES has demonstrated excellent internal consistency of .94 and .95 (Underwood & Teresi, 2002).

Satisfaction with life. To better understand how participants conceptualized their lives, the Satisfaction with Life Scale (SWLS) was used. The SWLS is a short, five item instrument with questions pertaining to global life satisfaction rather than specific constructs (Diener et al., 1985). Participants completed the items on a Likert scale of disagreement and agreement, ranging from one to seven. Scores resulted in a total sum of dissatisfaction or satisfaction. In Diener et al.'s initial investigation, Cronbach's alpha coefficient was .87. A two month test-retest was high, with an estimated correlation coefficient of .82 and a coefficient alpha of .87. Pavot and Diener (1993) later highlighted the good convergent validity with other scales and discriminant validity from emotional well-being measures. These researchers further stated that "the SWLS is recommended as a complement to scales that focus on psychopathology or emotional well-being" (p. 164). This may be of particular interest given the present study's aims.

Statistical Analysis

Pearson product-moment correlations were used to explore the relationships between HbA1c and BMI and the psychosocial, spiritual, and satisfaction with life variables. Multiple linear regression was used to investigate how strongly the independent variables of psychological distress, social support, and spirituality predicted life satisfaction in African American and Hispanic patients, and to identify which of the independent variables were the best predictors of life satisfaction. Prior to running the multiple regression, normal probability plots and scatterplots were also explored to evaluate outliers, normality, linearity, and homoscedasticity. Multicollinearity was assessed by examining the intercorrelations of the independent variables. One-way analysis of variance was used to investigate mean differences on psychosocial, spiritual, and satisfaction with life total scores and scale scores between the ethnic groups. Social support and spirituality were investigated as moderators of the relationship between psychological distress and SWL for African American and Hispanic participants. The moderator analysis for each ethnic group involved the following steps: centering of the predictor variables by subtracting the group mean of each variable for each score, multiplying the pair of centered variables (social support and psychological distress or spirituality and psychological distress) to form interaction terms, and performing a sequential multiple regression where the two centered predictor variables were entered on the first step followed by the interaction term on the second step. Evidence of moderation was noted when the interaction term led to a statistically significant increase in R squared. All analyses were performed with SPSS version 16, while all p values <.05 were taken as statistically significant.

Results

Participants included 142 individuals with uncontrolled or newly diagnosed type 2 diabetes. Demographics (e.g., age, sex, ethnicity, and income) and Cronbach's alpha coefficients are found in Table 1. The majority of African American participants were between 31-50 years of age, while most Hispanic participants were older than 50 years of age ($p < .001$). Over 60% of the African American patients and 75% of the Hispanic patients were female. Some missing data was prevalent for income. For African American and Hispanic participants with available data, approximately 70% had incomes of $20,000 or less. A larger proportion of the African Americans were married compared to the Hispanic patients.

Results of the one-way analysis of variance used to compare mean differences on all the quantitative study variables between the ethnic groups are documented in Table 2. Hispanic patients had a statistically significant higher mean score on spirituality than African Americans, and African American patients had a statistically significant higher mean score on life satisfaction compared to the Hispanic patients. African American patients also had statistically significant higher mean score on the BSI-18 subscale of depression compared to Hispanic patients; however, this difference did not exist for the total PHQ-8 depression scores or total psychological distress scores from the BSI-18. The groups were not significantly different from each other on the remainder of the measures.

The relationship between total scores for depression, psychological distress, social support, spirituality, and relevant subscale scores with levels of HbA1c or BMI for African American and Hispanic ethnic groups were explored in question one. The results for these correlations, documented only one statistically significant, weak relationship ($r = .25, p < .05$) between BMI and the subscale of somatization among African American participants are presented in Table 3. No inherent restrictions were noted for ranges in scores except for HbA1c due to inclusion of only participants with newly diagnosed or uncontrolled diabetes. Thus, there were no noteworthy relationships between biomedical markers of disease management and psychosocial or spiritual constructs for Hispanic or African American participants.

How well psychological distress, social support, and spirituality predicted life satisfaction and which of the predictor variables were the best predictors of life satisfaction for each ethnic group were explored in question two. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Scores from the BSI-18 (total psychological distress) were used instead of PHQ-8 (depression) for this analysis since the psychological distress includes a broader exploration of psychological functioning, incorporating depression. Upon initial analysis, subscales of the BSI-18 were strongly related to each other and the PHQ-8 for African American ($r = .84$, $p < .001$) and Hispanic participants ($r = .74$, $p < .001$). Additionally, scores from the BSI-18 had larger alphas for African American and Hispanic participants, .96 and .93 respectively, when compared to alphas on the PHQ-8, which were .91 and .84 respectively.

The multiple regression statistics for the prediction of life satisfaction from the independent variables of psychological distress, social support, and spirituality for the African American and Hispanic ethnic groups are presented in Table 4. The three independent variables explained 63% of the variance in perceived satisfaction with life for the African American patients, and 29% of the variance in perceived satisfaction with life for the Hispanic patients. Although both regression models rejected the null hypothesis that the population multiple R equals zero, the variance explained for life satisfaction in African American patients was over twice as large as the variance explained for the Hispanic patients.

How well psychological distress, social support, and spirituality predicted life satisfaction among African American and Hispanic groups was examined in question three. The independent variables that were the best predictors of SWL differed in the two ethnic groups are also shown in Table 4. For the African American patients, psychological distress and social support made the largest unique statistically significant contribution to the prediction of SWL, while psychological distress and spirituality made the largest unique statistically significant contribution for Hispanic patients. Social support was the strongest predictor for the African American patients, while psychological distress was the strongest predictor for the Hispanic patients.

The role of spirituality and social support as moderators of the relationship between psychological distress on SWL were addressed in question four. Following the sequential multiple regression analysis, the only statistically significant interaction was for psychological distress and social support among Hispanic participants. The predictors of social support and psychological distress accounted for 25.4% of the variability in SWL (F [2, 65] = 11.04, $p < .001$). When the interaction term was added in step two, this term explained an additional 4.7% of the variance, a statistically significant increase (F [1, 64] = 4.27, $p = .04$). Thus, for the Hispanic participants, total social support moderated the effect of psychological distress on SWL. Significant interactions were not noted when social support was explored as a moderator for African Americans. Furthermore, spirituality was not a moderator for either ethnic group.

Conclusion

In this study, we hoped to quantify the experiences of African American and Hispanic patients with type 2 diabetes across a number of biopsychosocial-spiritual variables. Some initial demographic differences were present between groups, which may have implications for findings. Hispanic patients were significantly older than African American patients. Other statistically significant differences included most African American participants were either single or married, where Hispanic participants were almost evenly distributed between these two groups and divorced, separated, or widowed. The proportion of Hispanic patients reporting separation from a spouse may be reflective of the geographical distance between partners who have recently immigrated to the United States, leaving a partner and family behind temporarily.

When exploring the relationships between psychosocial-spiritual variables and biomedical markers of disease management, including HbA1c and BMI, for each ethnic group, there was only one weak relationship between somatization and BMI for African American participants. Since somatization questions assessed a number of physical symptoms (e.g., nausea, shortness of breath, dizziness), a relationship between physical complaints and elevated weight might be expected. Otherwise, there were no significant relationships between psychological concerns, such as depression and anxiety, and markers of physical health or disease management. This finding is contrary to prior meta-analytic and review studies where researchers highlighted the influence of depression on worse glycemic control and poorer diabetes outcomes (Ali et al., 2006; Lustman et al., 2000). However, some past researchers have included individuals with type 1 diabetes and nonminority groups in their samples, which may make them somewhat divergent from the present study. When studying a minority cohort similar to the present study, past researchers also questioned the strength of a relationship between depression and glycemic control (Trief, Morin, Izquierdo, Teresi, Eimicke, et al. 2006). Of note, glycemic control had limited variability in the present study and referenced study, which may have influenced the ability to detect a significant relationship. However, another hypothesis is that influences other than psychosocial values, such as access to care, healthy foods, cultural factors, or medication, may be larger influences than psychopathology on HbA1c and BMI in distinctly rural minority groups.

While psychological distress, social support, and spirituality did not significantly relate to biomedical markers, some were significantly predictive of SWL among African American and Hispanic participants. When explored together, these variables accounted for twice as much variation in SWL for African American than Hispanic participants. Thus, while interventions directed at psychopathology or interpersonal relationships may not lead to dramatic shifts in disease management, they may significantly influence perceived SWL, especially among African American patients. Longitudinal data within future intervention studies might assist in conceptualizing this relationship. Researchers, such as Kimmel et al. (1995), concluded, "psychosocial interventions directed toward potentially modifiable factors, such as depression and social support may be used, in addition to standard medical interventions, in an attempt to improve QOL" (p. 1425). This seems relevant in the present study as well, since psychological distress, social support, and spirituality served similar roles in SWL.

Social support and spirituality should be integrated into treatment with greater attention due to distinctiveness amongst the minority ethnic groups. When explored separately, social support was the strongest predictor of SWL for African Americans; whereas, psychological distress was the strongest predictor of SWL for Hispanics. Differences were also noted in the largest unique contributors to SWL, where psychological distress and social support were noted for African Americans and psychological distress and spirituality were noted for Hispanic participants. Thus, African American patients' SWL may be more impacted by social interventions (e.g., couple therapy, family therapy), while Hispanic patients' SWL may be more influenced by spiritual interventions (e.g. meaning making, use of a higher power). Both African American and Hispanic patients would likely benefit from interventions directed toward psychological distress (e.g., psychotherapy, pharmacotherapy), as it was significantly predictive of SWL for both groups. Past researchers have found depression to be strongly negatively correlated to SWL, citing that a person is highly unlikely to view their life as satisfying while under a significant amount of psychological distress (Headey, Kelley, & Wearing, 2005). One assumption is that those who are struggling with depression or psychological distress would be more likely to use a negative schema in their reflection upon past and present circumstances. However, coping resources derived from social or spiritual outlets may moderate pessimistic views.

While social support and spirituality may directly impact SWL, some commonalities and differences were present for each ethnic group when explored as moderators. For African Americans, neither social support nor spirituality moderated the relationship of psychological distress on SWL. Similarly, spirituality did not moderate the relationship of psychological distress on SWL for Hispanics; however, social support did moderate this relationship. This would lead us to hypothesize that incorporation of social supports into therapeutic treatment for Hispanics who are psychologically distressed might assist in decreasing negative implications for SWL. Also, spirituality may not always act as a protective factor in the relationship of psychological distress to SWL for some ethnic minorities. However, further data are needed to understand the role of spirituality in subjective well-being for both African American and Hispanic patients with diabetes, along with conceptualizing the lack of moderation by social supports for African American groups. Additionally, more research documenting the relationship between psychological distress and SWL among Hispanic groups might assist in understanding how significant others, family, or friends intercede in this relationship. These are only a few of many recommendations for future investigation.

Looking forward, the present findings provide a descriptive platform for further inquiry among minority patients with type 2 diabetes. Future study of psychological symptoms, such as depression and anxiety, using more variable measures of HbA1c may be of interest to confirm or deny this association for minority groups. In particular, a focus on similarities or differences between patients with attained glycemic control versus those with uncontrolled diabetes would be useful. The deficiency of data pertaining to SWL among those with type 2 diabetes calls for additional investigation into the determinants and/or implications of this construct. An appreciation for similarities and differences in SWL according to demographics, such as ethnic group, age, or socioeconomic status, would build upon this study's findings. Additionally, consideration of how satisfaction or dissatisfaction with one's life relates to disease management, psychological functioning, social relations, and existential faith among individuals with type 2 diabetes would likely expand knowledge, leading to newer approaches in diabetes care.

While the present study adds to the minimal literature surrounding SWL and interrelatedness of biopsychosocial-spiritual factors, a few cautions should be applied regarding the conclusions. First, narrow variability in HbA1c limits inferences with regards to relationships of psychological, social, or spiritual variables and glycemic control. Of note, participants' BMIs were quite variable and still no relationship existed in this respect. A second limitation involves the nature of participants' diabetes related symptoms. Some psychological measures may have been skewed in the direction of more distress due to biomedical symptoms being measured as psychological symptoms, such as anxiety or somatization. Another limitation pertains to the time of data collection since all measures, except HbA1c, were administered during the first visit within the collaborative care program. In a true predictive study, the dependent variable is measured at a later date than the independent variable, thus our findings may be more correlational in nature. Thus, future researchers' use of longitudinal data might assist in remedying this limitation. A final note involves the administration of measures. All questions were read to participants due to low literacy rates common to the region. While this was an effective means for ensuring all individuals had an equal opportunity for participation, it may have led to some response bias. Thus, as researchers generate new knowledge, they would benefit from mindfulness of these limits.

Acknowledgements

This collaborative program was funded by the North Carolina Health and Wellness Trust Fund to improve the outcomes for mostly minority, underserved patients with type 2 diabetes.

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Table 1

Demographic Characteristics

		AA (n = 65)		Hispanic (n = 77)	
Factor	Category	%	n	%	n
Age**	18-30	4.6%	3	2.6%	2
	31-50	75.4%	49	36.4%	28
	> 50	19.9%	13	61.1%	47
Sex	Male	36.9%	24	24.7%	19
	Female	63.1%	41	75.3%	58
Income	< 10k	43.1%	28	44.2%	34
	10-20k	27.7%	18	24.7%	19
	20-30k	7.7%	5	18.2%	14
	> 30k	0.0%	0	5.2%	4
	No data	21.5%	14	7.8%	6
Marital St*	Single/Not Married	44.6%	29	36.4%	28
	Married	50.8%	33	37.7%	29
	Div/Sep/Widow	4.6%	3	23.4%	18
	No data	0.0%	0	2.6%	2

Chi-square analysis *$p < .01$; **$p < .001$

Table 2

One-Way ANOVA Between Ethnic Group Comparisons

	African American			Hispanic			
Measure	M	SD	Alpha	M	SD	Alpha	*p*
HbA1c	10.3	2.30		9.6	2.15		.07
BMI	34.5	6.84		37.1	9.06		.06
PHQ (Depression)	7.2	7.35	.91	8.2	6.29	.84	.39
BSI (Total Distress)	14.4	16.68	.96	10.9	12.43	.93	.17
BSI (Depression)	5.4	6.71	.92	3.4	5.02	.88	.05
BSI (Anxiety)	4.2	5.51	.88	2.8	4.38	.86	.10
BSI (Somatization)	4.7	5.70	.91	4.7	4.19	.76	.96
MSPSS (Total Support)	67.6	16.47	.95	69.5	15.38	.92	.49
MSPSS (Sig Other)	6.1	1.23	.87	6.1	1.29	.85	.85
MSPSS (Family)	6.0	1.59	.98	5.9	1.62	.94	.77
MSPSS (Friends)	4.8	1.93	.95	5.3	1.77	.94	.12
DSES (Spirituality)	58.6	17.22	.95	67.7	11.69	.95	<.001
SWLS (SWL)	26.8	5.59	.80	21.99	8.19	.87	<.001

Table 3

HbA1c and BMI Correlated with Psychosocial, Spiritual, and Satisfaction with Life

	AA		Hispanic	
	HbA1c	BMI	HbA1c	BMI
PHQ (Depression)	-.02	.19	.11	.04
BSI (Total Distress)	-.02	.23	.03	-.09
BSI (Depression)	-.01	.18	.05	-.08
BSI (Anxiety)	.03	.23	.07	-.11
BSI (Somatization)	-.06	.25*	-.08	-.04
MSPSS (Total Support)	.06	-.04	-.16	.01
MSPSS (Sig Other)	.10	-.10	-.20	.05
MSPSS (Family)	.00	-.12	-.10	-.11
MSPSS (Friends)	.08	-.09	-.13	.10
DSES (Spirituality)	.02	-.14	-.21	.23
SWLS (SWL)	.10	-.23	-.00	.10

* $p < .05$

Table 4

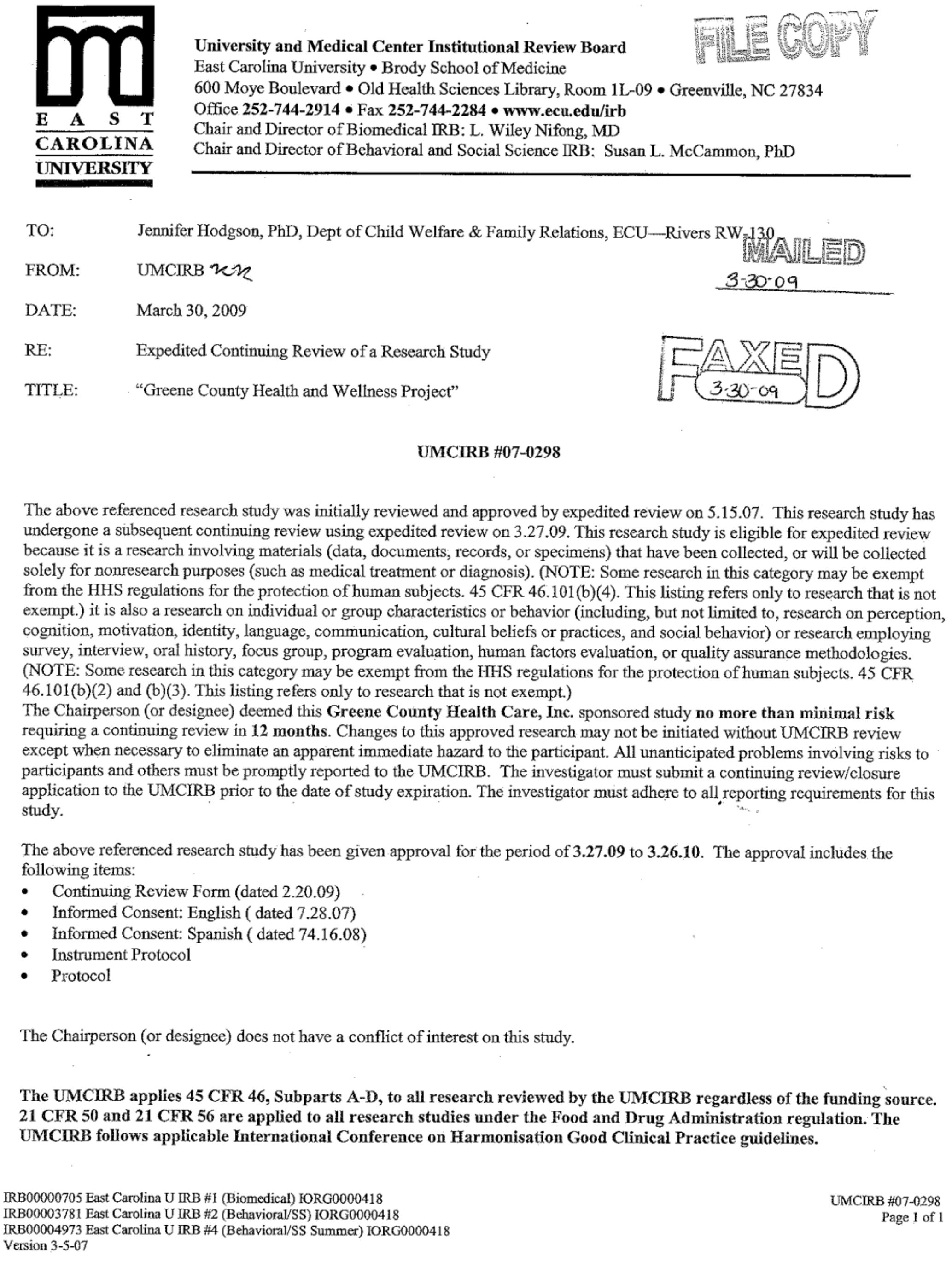
Multiple Regression Analysis of Life Satisfaction Regressed on Psychological Distress, Social Support, and Spirituality

	AA[1]				Hispanic[2]			
Predictor Variable	b	SE	Beta	*p*	b	SE	Beta	*p*
Psyc Distress	-.12	.04	-.34	.001	-.25	.07	-.38	.001
Social Support	.18	.03	.54	< .001	.04	.06	.08	.49
Spirituality	.02	.03	.07	.40	.19	.08	.28	.02

[1] $R^2 = .64$; Adjusted $R^2 = .63$; F = 33.35, df = 3, 55, $p < .001$

[2] $R^2 = .32$; Adjusted $R^2 = .29$; F = 9.95, df = 3, 63, $p < .001$

Appendix A: IRB Approval and Informed Consent



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

FILE COPY

TO: Jennifer Hodgson, PhD, Dept of Child Welfare & Family Relations, ECU—Rivers RW-130

MAILED
3-30-09

FROM: UMCIRB

DATE: March 30, 2009

RE: Expedited Continuing Review of a Research Study

TITLE: "Greene County Health and Wellness Project"

FAXED
3-30-09

UMCIRB #07-0298

The above referenced research study was initially reviewed and approved by expedited review on 5.15.07. This research study has undergone a subsequent continuing review using expedited review on 3.27.09. This research study is eligible for expedited review because it is a research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis). (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(4). This listing refers only to research that is not exempt.) it is also a 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 **Greene County Health Care, Inc.** 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 **3.27.09** to **3.26.10**. The approval includes the following items:

- Continuing Review Form (dated 2.20.09)
- Informed Consent: English (dated 7.28.07)
- Informed Consent: Spanish (dated 74.16.08)
- Instrument Protocol
- Protocol

The Chairperson (or designee) does not have a 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 #07-0298
Page 1 of 1

Health and Wellness Trust Fund – Health Disparities Initiative
Project 2006 – 2009
Informed Consent Form

You are being asked to be in a project that includes a research study. Ask as many questions as you like before you decide whether you want to be in this project. You are free to ask questions at any time while you are in this project.

PURPOSE OF THE GREENE COUNTY HEALTH & WELLNESS PROJECT

The goal is to cut down the chances of sickness and death from diabetes (sugar) among African - American and Hispanic patients with poor blood sugar control or those who just find out that they are diabetic during the project (July 1, 2006 – July 1, 2009). The project is not exclusive to African American and Hispanic participants, other ethnic groups are eligible.

The therapeutic team's goal is to help patients:

1. Lower blood sugar and hemoglobin levels.
2. Increase exercise.
3. Attain or move toward a healthy weight.
4. Improve mental health.
5. Establish reasonable goals.
6. Come to your appointments.
7. Come to group sessions.
8. Lower the number of amputations.

*The therapeutic team includes:

A. Diabetes Health Educator / Case Manager
B. Medical Family Therapists (MedFT)
C. Promotoras / Lay Health Workers
D. Medical Providers

Medical family therapists work to assist patients and their family members with the thoughts, feelings, behaviors and other challenges that sometimes get in the way of managing an illness such as diabetes. They are trained to work well with your treatment team and help you in reaching your health care goals.

AGE REQUIREMENTS

- You must be 18 years or older to participate in this study.

POSSIBLE RISKS

There is the possible risk of increased psychosocial stress or embarrassment from sharing your personal thoughts and feelings in private therapy or group sessions. During the interview process information shared may make you uncomfortable, but recommendations will be based on what you tell us. Therapists are available to help you if anything makes you uncomfortable and you may stop your participation at any time.

POSSIBLE BENEFITS

As a result of your participation in this study, you will have more information about your diabetes than you would normally receive from your regular office visits. You will also be able to talk to someone about how you feel about diabetes and how diabetes affects your life. You will have the benefit of a team of trained providers all focused on your success in managing diabetes.

FINANCIAL COST TO YOU

There is a Greene County Health Care charge of $10.00 per office visit.

LENGTH OF PROJECT

This is a three year project, July 1, 2006 – July 1, 2009. If you want to stop at any time, you may do so without penalty.

INFORMATION COLLECTED

Participants may be asked to share information including, but not limited to:

1. Family history – age, race, gender, telephone numbers, marital status, number in household, employment, language, education, and personal background.
2. Medical history – diabetes history (including obtaining your medical records to find your HbA1c, height and weight), feelings about diabetes, problems with diabetes, areas you would like to learn more about diabetes, medications you take, type of blood sugar meter used, recording blood sugar levels, date of physical and eye examination, need for eye glasses, changes in skin, how often you check your feet, general health, importance of health, use of tobacco products, visits to emergency room, wearing of a medical identification bracelet or necklace, history of pneumonia and flu vaccinations, pregnancy, and birth control.
3. Nutritional background – weight, types and amounts of foods you eat, special food needs, food allergies, feelings about food, your alcohol use, and cholesterol levels.
4. Exercise history – how often you exercise, type of exercise and any problems with exercise.
5. Medical/Mental Health History - Levels of stress, how you deal with stress, how much support you have, your spirituality, and mental health.

DATA COLLECTION

You will be asked questions from the 'Diabetes Education Initial Evaluation form' with the Diabetic Health Educator. A Medical Family Therapist will also be present as long as one is available. The therapist will also ask you questions.

1. Your answers to some questions will be typed into a computer, and others will be written down on paper.
2. You may be asked to give more information about an answer if needed.
3. After the form is completed, the therapy team will give you comments, answer your questions and listen to your concerns.
4. Your medical and psychological information might be discussed with your physician.
5. At the next visit, the therapy team will give you recommendations.
6. If you need an interpreter, we will talk with you about getting one.
   If you need assistance reading or understanding words that are used during the course of the study, we will be happy to stop and explain everything in greater detail.

Monthly evaluations for this project are sent to Shaw University. They use computer based files set up by the Institute for Health, Social and Community Research. Participant names will not be included in these evaluations.

PRIVACY

No information that identifies you will be released to any one without your written consent. Publications or presentations of the project will not identify you personally. Personal information will be kept in a locked filing cabinet in the offices of the educator and therapists. Both offices will have outer doors which will be kept locked when the staff is not present. Office door keys are provided only to staff occupying the office. The key for the file cabinet is not the same key for the office door.

Specific to East Carolina University – Medical/Marriage and Family Therapy Only
Confidentiality (Privacy) may be broken and information shared without your permission only in the following specific situations.

1. *When you sign a 'Release of Information', which allows us to exchange information with people or institutions, that you name.*
2. *By law, we must report abuse or neglect of children, elderly or disabled.*
3. *By law, we must report when you are a danger to yourself or to others.*
4. *By law, we must disclose if you sue for malpractice, or when you use your mental health as a defense in court.*
5. *By law, we must disclose when a court orders a therapist to share records of therapy or to testify. A subpoena for records or testimony does not release confidential information. The order to break confidentiality must be given by the judge.*

Information will be shared with the therapists' supervisors, Drs. Jennifer Hodgson and Angela Lamson from East Carolina University. Therapists are graduate student interns of East Carolina University. Information that will be shared includes therapy, testing, and evaluations. This information may also be used for instruction or published in research journals – without specific names of participants being given.

PARTICIPANT RIGHTS

For purposes of therapy and diabetic health education patients have the right to:

- ✓Ask questions and receive answers about treatment.
- ✓Ask about the methods of treatment.
- ✓Ask about cost.
- ✓Ask about the therapist and educator.
- ✓Make decisions about your life.
- ✓End therapy or education.
- ✓Find services elsewhere.
- ✓Expect confidentiality about therapy and education.
- ✓Stop participating at any time with no penalty.

*Therapist and diabetic health educator DO NOT:

- ×Do not get involved in matters of custody.
- ×Give intelligence and educational testing.
- ×Provide testing for jobs.

*Referrals are provided for these services if needed.

TRANSLATION SERVICES

If you need an interpreter, Greene County Health Care, Inc. will do the best it can to provide one. This may not always be possible. Your appointment days and times may be limited to the availability of an interpreter. It is important that you and the therapeutic team form a good relationship. This relationship may need help by the presence of an interpreter. There may be errors in interpretation that are not intentional.

I have received a complete explanation of the study and I agree to participate.

Print/Type Full Name:

Signature:

Date:

Information about the person signing for the above in cases which the participant cannot read and/or write

I have received permission from the participant to sign on their behalf

Print/Type Full Name:

Signature:

Date: Age:

Witness:

☐Investigator:

Date:

If you have any questions regarding this project,
please direct them to one of the following individuals.

Cathy D. Howell, MA, CHES Diabetic Health Educator	747-2921 Ext. 310 chowell@greenecountyhealthcare.com	302 North Greene St. PO Box 658 Snow Hill NC 28580
Jennifer L. Hodgson, PhD, LMFT Associate Professor Department of Child Development and Family Relations College of Human Ecology East Carolina University	252-328-1349 hodgsonj@ecu.edu	130 Rivers Building ECU Greenville, North Carolina 27858-4353
Angela L. Lamson, PhD, LMFT Associate Professor Department of Child Development and Family Relations College of Human Ecology East Carolina University	252-737-2042 lamsona@ecu.edu	150 Rivers Building ECU Greenville, North Carolina 27858-4353

Any additional concerns or questions that you feel have not be adequately addressed by one the individuals above, then please contact:

Doug Smith CEO & President of Greene County Health Care, Inc.	252-747-8162 Ext. 205 dsmith@greenecountyhealthcare.com	302 North Greene St. PO Box 658 Snow Hill NC 28580

ABOUT THE NC HEALTH AND WELLNESS TRUST FUND

The NC Health and Wellness Trust Fund makes North Carolina stronger, both physically and economically, by funding programs that promote preventive health. Created by the General Assembly in 2000 to allocate a portion of North Carolina's share of the national tobacco settlement, HWTF has invested ***$143*** *million to support preventive health initiatives and* ***$102*** *million to fund prescription drug assistance programs. For more information, please visit www.HealthWellNC.com.*

Research Participant Authorization to Use and Disclose Information for Research

UMCIRB#: 07-0298 **PI: Drs. Jennifer Hodgson and Angela Lamson**

Title: Greene County Health and Wellness Project

When taking part in research, health information is collected, used, and shared with others who are involved in the research. Federal laws require that researchers and health care providers protect your identifiable health information. Also, federal laws require that we get your permission to use collected health information 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 health information. Specifically, this information includes:

Select the boxes that identify the types of health information:
[☐] Billing records [☐] Hospital/medical records (in and out patient)
[☒] Mental Health records [☒] Lab, pathology and/or radiology results
[☒] Physician/clinic records [☐] PHI previously collected for research purposes
[☐] Other:
The members of the research team will conduct the research study at ☐ ECU ☐ PCMH ☐ ECU & PCMH ☒ Other: Facilities owned and/or operated by Greene County Health Care, Inc.

Select the boxes that identify who gets the information:
[☒] 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 investigatory activity
[☒] Researchers at other sites to participate in the research when more than one research site is involved
[☒] Other Members of your medical team at Greene County Health Care, Inc.

Information about you will be used and released in such a way that will protect your identity as much as possible. The individual/agencies who may receive health information about you also agree to keep this information confidential. However, there is always a chance that you information could be shared in a way that it would no longer be protected. Therefore, although we take precautions to protect your information, confidentiality cannot be absolutely guaranteed.

We are asking your permission to share your health information related to this study with the individuals/agencies listed above upon their request. You may or may not be eligible to begin participating in this study if you do not sign this Authorization form. You have the right to stop or limit the sharing your information. You have the right to limit who may receive this information. You may stop or limit how your protected health information is used for this research study by giving the investigator your request in writing. If you want us to stop using your information, 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. Protected Health Information collected for the purpose of the research study collected prior to withdrawing your Authorization will continued to be used for the purposes of the research study.

We will share only the information listed above with the individuals/agencies listed above. If we need to share other information or if we need to send it to other individuals/agencies not listed above, we will ask you permission in writing again. At any time, you can ask us to tell you what information about you has been shared and with whom. However, you may not have access to your information until the study is over.

Research information continues to be looked at after the study is finished so it is difficult to say when use of your information will stop. Currently, there is not an expiration date for the use and disclosure of your information for this study.

If you have questions about the sharing of information related to this research study, call the principal investigator Jennifer Hodgson, PhD at phone number 252-328-1349 or Angela Lamson, PhD at phone number 252-737-2042**.** Also, you may telephone the University and Medical Center Institutional Review Board at 252-744-2914. In additional, 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 at East Carolina University 252-744-2030.

Authorization

I authorize the principal investigator Drs. Jennifer Hodgson or Angela Lamson to share my research information with the individuals/agencies listed above. This information is to be used for research purposes. A signed copy of this Authorization will be given to you for your records.

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

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

Fondo de Inversiones de Salud y Bienestar – Iniciativa de Disparidades/discrepancias de Salud

Proyecto 2006 – 2009

Formulario de Consentimiento Informado

Se le está pidiendo participar/ser parte de un proyecto.
Haga todas las preguntas que desee antes de decidir si usted quiere participar en este proyecto. Usted puede hacer preguntas durante cualquier momento en este proyecto.

PROPOSITO DEL PROYECTO DEL SALUD Y BIENESTAR DEL CONDADO DE GREENE

La meta es para reducir los riesgos de enfermedad o muerte de diabetes (azúcar) entre pacientes afro americanos e hispanos con mal control de azúcar en la sangre o aquellos que se enteran que son diabéticos durante el proyecto (Julio 1, 2006 – Julio 1, 2009).

La meta del grupo terapéutico es para ayudar pacientes:

1. Bajar los niveles de azúcar y hemoglobinas.
2. Aumentar el ejercicio.
3. Alcanzar o tratar de tener un peso saludable.
4. Mejorar la salud mental.
5. Establecer metas razonables.
6. Asistir a sus citas.
7. Asistir a las sesiones en grupo.
8. Bajar el número de amputaciones.

*El grupo terapéutico incluye:

A. Educador de salud de diabetes / Director del Caso
B. Terapeutas médicos de familia (MedFT)
C. Trabajadores de salud.

Terapeutas médicos de familia trabajan para ayudarles a pacientes y sus familiares con los pensamientos, sentimientos, comportamientos y otros retos que hay veces intervienen con el manejo de enfermedades como la diabetes. Ellos están entrenados para trabajar efectivamente con su grupo de tratamiento y ayudarle a alcanzar sus metas de salud.

REQUISITOS DE EDAD

- Usted tiene que tener 18 años o más de edad para poder participar en este estudio.

POSIBLES RIESGOS

Hay un posible riesgo de aumento de estrés psicológico o vergüenza de compartir sus pensamientos y sentimientos personales en terapia privada o en grupo. Durante el proceso de la entrevista, la información compartida lo puede poner incomodo, pero recomendaciones serán dadas basadas en lo que usted nos diga. Los terapeutas están disponibles para ayudarle si algo le llega a incomodar y usted puede parar su participación en cualquier momento.

POSIBLES BENEFICIOS

Como resultado de su participación en este estudio, usted tendrá más información acerca de su diabetes que usualmente recibiría en sus visitas regulares. Usted también podrá hablar con alguien sobre como se siente sobre la diabetes y como la diabetes afecta su vida. Tendrá el beneficio de un grupo de profesionales quienes se enfocan en su éxito con el manejo de la diabetes.

LOS COSTOS FINANCIEROS PARA USTED

Hay un cargo de $10.00 por visita del Centro de Salud del Condado de Greene.

DURACIÓN DEL PROYECTO

Este es un proyecto de 3 años, Julio 1, 2006 – Julio 1, 2009. Si quiere para en cualquier momento, lo puede hacer sin ninguna penitencia.

INFORMACIÓN OBTENIDA/RECOGIDA

A los participantes se les puede preguntar que compartan información incluyendo, pero no limitada a:

1. Historia familiar – edad, raza, sexo, números de teléfono, estado civil, cantidad de personas en el hogar, empleo, lengua, educación, y origen personal.
2. Historia Médica – historia de diabetes, (que incluye obtener sus historiales médicos para encontrar su HbA1C, altura, y el peso), sentimientos sobre la diabetes, problemas de diabetes, áreas que le gustaría aprender mas sobre la diabetes, medicamentos que toma, tipo de metro usado para medir el azúcar en la sangre, niveles anotados de azúcar en la sangre, fecha de examen físico y examen de ojos, necesidad para gafas, cambios en la piel, cada cuanto se chequea los pies, salud general, la importancia de la salud, uso de productos de tabaco, visitas al centro de emergencias, el uso de pulseras o cadenas de identificación médica, historia de neumonía y vacunas de la gripe, embarazo, y control de la natalidad/planificación familiar.
3. Historia Nutricional – peso, tipos y cantidades de comida que consume, necesidades alimenticias, alergias de comida, sentimientos sobre la comida, su uso de alcohol, y niveles de colesterol.
4. Historia de Ejercicio – cada cuanto hace ejercicios, tipo de ejercicio y problemas con el ejercicio.
5. Historia de Salud Médica/Mental – Niveles de estrés, como maneja el estrés, cuanto apoyo tiene, su espiritualidad, y salud mental.

COLECCIÓN DE INFORMACIÓN

Se le harán preguntas de 'La Inicial Evaluación de Educación de Diabetes' con el educador de salud sobre la diabetes. Un Terapeuta médico de familia también estará presente desde y cuando uno este disponible. El terapeuta también le hará preguntas.

1. Sus respuestas a algunas preguntas serán escritas en un computador, y otras serán escritas en un papel.
2. Quizás le preguntará más información sobre alguna respuesta si es necesario.
3. Después de haber completado el formulario, el grupo de terapia le darán unos comentarios, contestarán sus preguntas, y escucharan sus inquietudes.
4. Su información médica y fisiológica puede ser discutida con su doctor.
5. En la próxima visita, el grupo de terapia le dará recomendaciones.
6. Si necesita un intérprete, habláremos con usted para conseguir uno.
7. Si necesita ayuda leyendo o entendiendo palabras que son usadas durante el transcurso del estudio, estaremos encantados de parar y explicarle todo en más detalle.

Evaluaciones mensuales de este proyecto son mandadas a la Universidad de Shaw. Ellos usan archivos de computador, diseñados por el Instituto para Investigaciones de Salud, la Comunidad y lo Social Los nombres de los participantes no serán incluidos en estas evaluaciones.

PRIVACIDAD

Ninguna información que lo identifique será dada a ninguna persona sin su permiso escrito. Publicaciones o presentaciones de este proyecto no lo identificaran personalmente. Información personal será mantenida en un archivo y gabinete cerrado con seguro en las oficinas del educador y los terapeutas. Las dos oficinas tendrán puertas afuera que serán mantenidas con seguro cuando el personal no este presente. Las llaves de la oficina son dadas solo al personal que ocupa la oficina. La llave para el gabinete no es la misma llave para la puerta de la oficina.

<u>Especifico para la Universidad de Este Carolina – Solo para Terapia Médica Matrimonial y Familiar</u>
Confidencialidad (Privacidad) puede ser deshecha e información compartida sin su permiso sólo en las siguientes y especificas situaciones:

1. Cuando usted firma un formulario de 'Entrega de Información', que nos deja intercambiar información con gente o instituciones que usted nombre.
2. Por la ley, tenemos que reportar abuso o negligencia de niños, ancianos o incapacitados.
3. Por la ley, tenemos que reportar cuando usted es un peligro para usted mismo o para otros.
4. Por la ley, tenemos que revelar información si usted demanda por mal praxis (negligencia profesional), o cuando usted usa su salud mental como una defensa en la corte.
5. Por la ley, tenemos que revelar información cuando la corte ordena un terapeuta a compartir documentos de la terapia o para testificar. Una citación por documentos o testimonios no revela información confidencial. La orden para romper confidencialidad tiene que ser dada por el juez.

Información será compartida con los supervisores de terapeutas, Doctoras Jennifer Hodgson y Angela Lamson de la Universidad de Este Carolina. Terapeutas son estudiantes/practicantes graduados de la Universidad de Este Carolina. La información que será compartida incluye terapia, pruebas, y evaluaciones. La información también puede ser usada para enseñar o publicar revistas de investigación – Sin dar nombres específicos de los participantes.

DERECHOS DEL PARTIPANTE

Para propósitos de terapia y educación de salud sobre la diabetes, pacientes tienen el derecho de:

- ✓Hacer preguntas y recibir respuestas sobre el tratamiento.
- ✓Preguntar sobre los métodos de tratamientos.
- ✓Preguntar sobre el costo.
- ✓Preguntar sobre el terapeuta y el educador.
- ✓Tomar decisiones sobre su propia vida.
- ✓Terminar terapia o educación.
- ✓Conseguir servicios en otro lugar.
- ✓Contar con confidencialidad sobre la terapia y educación.
- ✓Parar de participar en cualquier momento sin ninguna penitencia.

*El Terapeuta y educador de salud sobre la diabetes <u>NO</u>:

- ×No se involucran en casos de custodia.
- ×Dan pruebas de inteligencia o educación.
- ×Dan pruebas para trabajos.

*Recomendaciones son ofrecidas para estos servicios si son necesarias:

SERVICIOS DE TRADUCCIÓN

Si necesita un interprete, el Centro de Salud del Condado de Greene, Inc. Hará lo mejor posible para proveer uno. Esto quizás no será siempre posible. Sus días y horas de citas pueden ser limitadas debido a la disponibilidad de un intérprete. Es importante que usted y el grupo terapéutico formen una buena relación. Esta relación puede necesitar ayuda con la presencia de un intérprete. Puede que haya errores en la interpretación que no fueron intencionales.

He recibido una completa explicación del estudio y estoy de acuerdo en participar.

Escriba Nombre Completo:

Firma:

Fecha:

Información acerca de la persona que firma por lo previo en casos cuando el participante no puede leer ni escribir

He recibido permiso del participante para firmar en su nombre

Escriba Nombre Completo:

Firma:

Fecha: Edad:

Personas involucradas en el proyecto:

☐Terapeuta Médico Familiar:

Fecha:

**Si tiene preguntas sobre este proyecto,
Por favor diríjaselas a una de las siguientes personas.**

Cathy D. Howell, MA, CHES Educador de Salud sobre diabetes	747-2921 Ext. 210 chowell@greenecountyhealthcare.com	302 North Greene St. PO Box 658 Snow Hill NC 28580
Jennifer L. Hodgson, PhD, LMFT Profesora Departamento de Desarrollo Infantil y Relaciones Familiares Colegio de Ecología Humana	252-328-1349 hodgsonj@ecu.edu	130 Rivers Building ECU Greenville, NC 27858-4353
Angela L. Lamson, PhD, LMFT Profesora Departamento de Desarrollo Infantil y Relaciones Familiares Colegio de Ecología Humana Universidad de Este Carolina	252-737-2042 lamsona@ecu.edu	150 Rivers Building ECU Greenville, NC 27858-4353

Alguna otra pregunta o inquietud que usted sienta no ha sido apropiadamente contestada por una de las personas mencionadas, por favor contacte:

Doug Smith Presidente del Centro Medico del Condado de Greene, Inc.	252-747-8162 Ext. 205 dsmith@greenecountyhealthcare.com	302 North Greene St. PO Box 658 Snow Hill NC 28580

Autorización para Usar y Dar a conocer Información para Participante de Investigaciones

UMCIRB#: 07-0298 **PI:** Drs. Jennifer Hodgson & Angela Lamson
Titulo: Greene County Health and Wellness Project

Cuando se participa en investigaciones, se recoge información de salud, y se comparte con otras personas que están involucradas en esta investigación. Las leyes federales requieren que los investigadores y proveedores de cuidados de salud protejan su información de salud identificable. Además, las leyes federales requieren que obtengamos su permiso para usar información de salud recopilada para la investigación. Este permiso se llama autorización.

Para poder completar el proyecto de investigación en el cual usted ha decidido participar, necesitamos recopilar y usar su información de salud. Específicamente, esta información incluye:

<u>Seleccione las casillas que identifiquen los tipos de información de salud:</u>

[☐] Expediente de Cuentas [☐] Expediente Medico/Hospital (Internado y no Internado)
[☒] Expediente de Salud Mental [☒] Resultados de laboratorio, patología, radiología
[☒] Expediente de Médicos/Clínica
[☐] PHI coleccionada previamente para propósito de Investigación.
[☐] Otro:

Los miembros del equipo de investigación conducirán un estudio de investigación en
☐ ECU ☐ PCMH ☐ ECU y PCMH [☒] Otros: Greene County Health Care, Inc.

<u>Seleccione las casillas que identifiquen a quien se dará la información:</u>

[☒] Patrocinador u otra fuente de recursos para proveer supervisión en el proyecto de investigación.
[☒] Investigadores de encuestas para conducir y supervisar el proyecto de investigación
[☒] Miembros del proyecto de investigación para participar en varias actividades de investigación
[☐] La FDA u otra agencia administrativa para proveer supervisión administrativa
[☒] La UMCIRB para proveer revisión continua del proyecto de investigación
[☒] Funcionarios de la Institución con obligaciones para supervisar la actividad investigativa.
[☒] Investigadores en otros sitios para participar en la investigación cuando más de un sitio de investigación esta implicado
[☒] Otro

Información acerca de usted se usará y se publicará dé tal forma que proteja su identidad lo más que sea posible. Los individuos o agencias que reciban información de salud acerca de usted están de acuerdo en mantener esta información confidencial. Sin embargo, siempre hay la posibilidad que su información pueda ser compartida en cierta forma de la cual no estaría protegida. Por consiguiente, aunque tomamos precauciones para proteger su información, no se puede garantizar una confidencialidad absoluta.

Le estamos pidiendo permiso para compartir, su información de salud relacionado con este estudio, a individuos o agencias en la lista citada anteriormente. Si usted quiere suspender el compartir esta información o desea limitar quien recibirá esta información, usted puede hacerlo. Sin embargo, para suspender o limitar información compartida, usted necesita hacer una petición por escrito. Si usted desea suspender el uso de información, se le podrá quitar de este estudio, pero su cuidado médico estandarizado y otros beneficios a los cuales usted tiene derecho no serán afectados. Información de salud protegida que se ha obtenido para el propósito del estudio de investigación antes de que usted retirara su autorización se continuara usando para él propósito del estudio de investigación.

Compartiremos solamente la información citada anteriormente únicamente con individuos o agencias en la lista de arriba. Si necesitamos compartir otra información o hay necesidad de mandarla a otros individuos o agencias que no están en la lista de arriba, pediremos su permiso por escrito nuevamente. En cualquier momento usted nos puede pedir que le digamos que información acerca de usted hemos compartido y con quien. Sin embargo, usted no tendrá acceso a su información hasta la terminación del estudio.

Información de investigación continuará siendo vista aun después de que el estudio ha terminado, o sea que es difícil determinar cuando terminará el uso de su información. Actualmente, no hay fecha de expiración para el uso y exhibición de su información para este estudio.

Si usted tiene preguntas acerca de cómo compartimos la información relacionada con este estudio de investigación, llame al Investigador principal al numero de teléfono. Además, Usted puede llamar por teléfono a University and Medical Center Institutional Review Board al (252) 744-2914. Además, si usted tiene preocupaciones acerca de los derechos de privacidad y c confidencialidad, usted puede llamar por teléfono al Oficial de Privacidad al Pitt County Memorial Hospital al número (252) 847-6545 o East Carolina University (252) 744-2030.

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Autorización

Autorizo Drs. Jennifer Hodgson or Angela Lamson a que comparta información con los individuos o agencias en la lista de arriba. Esta información se usará para propósito de investigación. Una copia firmada de esta autorización será entregada a usted para su archivo.

Nombre del participante	**Firma**	**Fecha**
Nombre del Representante-------Relación Autorizado	**Firma**	**Fecha**
Nombre de la Persona Obteniendo la Autorización	**Firma**	**Fecha**

Appendix B: Dissertation Proposal

Chapter Three: Proposal Introduction

Diabetes is a "disease associated with high levels of blood glucose resulting from defects in insulin production that cause sugar to build up in the body" (Center for Disease Control and Prevention [CDC], 2008), and when uncontrolled, may lead to serious long term complications including blindness, heart disease, lower-extremity amputations, and kidney failure, among others. Over the last few decades, the prevalence of this chronic illness has increased at such a rapid pace that our health care system has been overwhelmed by new and existing cases. In fact, the CDC estimated approximately 23.6 million individuals or 7.8% of the population had some form of diabetes in 2007, which includes 17.9 million diagnosed and another 5.7 million undiagnosed. Consequently, the CDC reported diabetes to be the seventh leading cause of death in the United States.

Epidemiological statistics from the Behavioral Risk Factor Surveillance System for North Carolina (CDC, 2002) are as shocking as the national data. From 1994 to 2007, the number of individuals diagnosed with diabetes in North Carolina increased from 4.4% to 9.1%. Additionally, in 2004, 24.8 % of North Carolinians with diabetes reported having at least one day of poor mental health in the last 30 days while 48.6% reported having at least one day of poor physical health in the past 30 days. No doubt, type 2 diabetes will be a major priority for future North Carolinians and our country if these trends continue. This may be particularly true since researchers recently revealed a lifetime risk for those born in 2000: one in three individuals are expected to develop the disease (Narayan, Boyle, Thompson, Sorensen, & Williamson, 2003). Anticipated increases in the development of type 2 diabetes seem particularly troublesome for ethnic minority and other underserved groups.

In a recent review, Egede and Dagogo-Jack (2005) highlighted the increased diabetes rates among minorities paired with greater occurrence of diabetes complications for these groups. Unfortunately, the CDC projected this disparity will likely continue in the future with an amplified risk of developing type 2 diabetes across groups, but especially among African American and Hispanic populations. Researchers have outlined the suspected etiology of these ethnic disparities, including genetic factors, environmental triggers (diet or lifestyle), and hypotheses related to genetic mutations and reproductive or developmental progressions (Egede & Dagogo-Jack, 2005). Secondary factors also play a key role for underserved groups, including patient adherence, socioeconomic factors, and physician practices (Egede & Dagogo-Jack, 2005). Recently, psychosocial and spiritual factors have been seen as interrelated with glycemic control.

When exploring the psychological influences on diabetes, depression has been most studied as a significant correlate or predictor of poorer glycemic control (e.g., Ali, Stone, Peters, Davies, & Khunti, 2006; Gross et al., 2005; Katon et al., 2005; Lin et al., 2004; Lustman et al., 2000), where others only found a weak or no relationship between the two (Kaholokula, Haynes, Grandinetti, & Chang, 2003; Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). Often, those at greater risk for having co-morbid minor or major depression were the underserved, such as those with lower educational levels, more financial stress, and some minority groups (Fisher, Chesla, Mullan, Skaff, & Kanter, 2001; Fisher et al., 2004; Katon et al., 2004; Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). Thus, as researchers continue to explore the landscape of diabetes for those most affected, it seems necessary to develop a more thorough understanding of psychological co-morbidities and diabetes management. Science would be remiss if demographic, cultural, social, and spiritual distinctions between patients were not included in these examinations since they may be confounders or mediators of diabetic health.

A number of researchers have started the exploration of social and spiritual experiences for underserved patients with type 2 diabetes (e.g., Bertera, 2003; Chesla et al., 2004; Cooper, Brown, Thi, Ford, & Powe, 2001; Newlin, Melkus, Tappen, Chyun, & Koenig, 2008; Polzer, 2007; Polzer & Miles, 2005, 2007; Samuel-Hodge et al., 2000; Shaw, Gallant, Riley-Jacome, & Spokane, 2006; Tang, Brown, Funnell, & Anderson, 2008; Trief, Morin, Izquierdo, Teresi, Starren, et al., 2006; Zaldivar & Smolowitz, 1994). In fact, researchers have found hostility in the family system versus familial togetherness impact medical and psychological functioning in different ways, such that conflict and stress were positively correlated with worse glycemic control and satisfaction with relationships was negatively correlated with worse glycemic control. (Chesla et al., 2004; Trief, Morin, Izquierdo, Teresi, Starren, et al., 2006). Differences have been noted among ethnic groups and geographic areas regarding use of family, friends, or larger systems (Bertera, 2003; Shaw et al., 2006), while conflicting results still exist for sex differences in perceived support (Gross et al., 2005; Tang et al., 2008).

Qualitative researchers have repeatedly found the belief in a higher power assists in coping for many patients (Polzer, 2007; Polzer & Miles, 2005, 2007; Samuel-Hodge et al., 2000). Newlin et al. (2008), in a study of 109 African American women, documented the relationship between religious or existential well-being and variability in glycemic control when demographic and clinical factors were held constant. These above mentioned researchers have begun "threading the fabric" that will eventually construct a biopsychosocial-spiritual landscape of type 2 diabetes; however, many others have overlooked how important social or spiritual variables may be in their assessments, as these variables might mutually influence biomedical or psychological symptom management. One way future researchers can begin merging and adding to relevant literature is through use of the biopsychosocial-spiritual framework.

Biopsychosocial-spiritual Theoretical Framework

The biopsychosocial approach has been a promising framework for conceptualizing health problems since it was first introduced by Engel in 1977. The addition of spiritual components by Wright, Watson, and Bell (1996) further expanded the perspective toward the beliefs, adaptation, and management of illness for individuals, couples, families, and communities. For many patients, this might also include the status of their religiosity or spirituality in the face of illness. The inclusiveness of this four-dimension approach offers a lens for researchers and clinicians to explore the interplay between the biological, psychological, social, and spiritual components.

The biopsychosocial-spiritual framework is the foundation for the present study. It was selected because it focuses on numerous dimensions of a patient's health care experience. Additionally, when compared to strictly biomedical perspectives, the approach allows clinicians and researchers to operate from a more comprehensive view of consumer health. For instance, a physician who places a patient with diabetes on insulin (biological) might assess thoughts surrounding needles or insulin use (psychological), family or friend support in starting the new regimen (social), and beliefs concerning God's will or faith in disease management (spiritual). Researchers interested in exploring the elements of this interplay are needed to appreciate how the disparities of underserved groups may engender different approaches and results to disease management.

Purpose of Study

The literature points to a need to comprehensively understand the psychosocial and spiritual influences on disease management. More specifically, how do social support and spirituality interact with HbA1c, body mass index (BMI), satisfaction with life, and psychological symptoms? Furthermore, research is needed to capture similarities or differences among subgroups of underserved patients according to demographics, such as age, sex, ethnic group, and marital status, as limited data exists.

The purpose of this study is to generate an enhanced understanding of the whole patient versus only subsets of functioning. We hope to do this through analysis of demographic, biological, psychological, social, and spiritual data answering a series of questions regarding comprehensive health at the start of a diabetes collaborative program. We seek to answer four research questions: 1) Does depression have a relationship with HbA1c or BMI?; 2) Are psychological variables predictive of satisfaction with life?; 3) Is social support or spirituality related to satisfaction with life or do they moderate the relationship of psychological variables to satisfaction with life?; 4) Are there differences in the biopsychosocial-spiritual experiences according to demographics?

Prospective Implications

Researchers will offer a number of implications for providers working with underserved groups with uncontrolled diabetes. Providers trained to conceptualize patients and families utilizing a systemic, biopsychosocial-spiritual framework might be especially interested in these findings. Four implications are anticipated, including: 1) understanding underserved patients with type 2 diabetes more comprehensively; 2) exploring the potential protective mechanisms behind depression, whether social or spiritual; 3) observing differences and/or similarities between subgroups, which could inform best practice in screening or assessment; and 4) emphasizing future populations in need of individualized and culturally sensitive interventions.

Recent researchers have recognized a relationship between psychological symptoms, particularly depression, and HbA1c. While our study hopes to explore this relationship for underserved patients, we also plan to integrate data pertaining to anxiety, BMI, perceived social support, spirituality, health care autonomy, and satisfaction with life. Integration of this data might expand our comprehensive understanding of underserved groups with diabetes. Additionally, many of these variables will be explored as they relate to psychological symptoms; thus, further exploring the interplay of physical, emotional, relational, and spiritual well-being.

Other implications will include observing the distinctiveness or commonalities among subgroups of underserved patients. For instance, do men and women report differing levels of depression or perceived social support? Moreover, do Hispanic participants report greater use of spirituality when compared to non-Hispanic white participants? These types of questions will initiate a thorough conceptualization of patients according to sex, ethnic group, age, or marital status. These prospective conclusions might also inform future interventions. For example, if our findings reveal older African Americans tend to report the highest levels of psychological symptoms and lowest amounts of social support from spouses, researchers or clinicians might want to consider a community program that targets depressed mood and relational well-being in underserved African American elders.

The findings might also inform current practices in primary care. For instance, if findings from this proposed study reveal that Mexican American females with high HbA1cs tend to have greater anxiety; providers might want to enlist a protocol that screens these patients for anxiety to enhance treatment. Hence, findings from this study may provide a roadmap for targeting the multiple areas of disease management needed to improve health in underserved groups diagnosed with type 2 diabetes. Furthermore, data related to patients' perceived level of health care autonomy might assist in improving these efforts. The health care providers' access to data on perceived autonomy aligns well with the Institute of Medicine's (IOM, 2001) objective to "transition from authoritarian models of care to approaches that encourage greater patient access to information and input in decision making" (p. 70).

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Abstract

This review of the literature documents the multiple influences on the management of type 2 diabetes among underserved, adult populations. The purpose of this review is to examine the existing body of knowledge about underserved populations in their management of type 2 diabetes and to apply a biopsychosocial-spiritual framework in organizing the literature to identify themes and gaps in knowledge. Underserved, adult populations included those who were uninsured, low income, members of a racial and ethnic minority group, of a lower educational level, and/or who were elderly. Literature from approximately 1995 to present was examined. Forty-four research studies were included in the final analysis. Findings suggest that a number of psychological, social, and spiritual variables influence glycemic control. In particular, depression and relational conflict adversely influenced glycemic control in some cases, whereas availability of social support or spiritual resources frequently assisted in better disease management. Preliminary research points to differences in experiences among ethnic groups; however, more data are needed for marital status, sex, and age. Limited empirical knowledge prompts the needs for further exploration of the psychosocial and spiritual influences of disease management among underserved groups and the use of collaborative interventions within research programs to examine the effectiveness of comprehensive screenings and treatment in clinical practice.

Key words: diabetes, underserved, disease management, biopsychosocial, spiritual

Chapter Four: Proposal Literature Review

Diabetes, a growing chronic illness in America, can be grouped into four classifications: diabetes mellitus type I, diabetes mellitus type II, gestational diabetes mellitus, and specific types of diabetes due to other causes (genetic defects or chemical induced) (American Diabetes Association [ADA], 2009). Type 2 diabetes accounts for approximately 90 to 95% of adults with the illness (CDC, 2008). This form of diabetes results from "a progressive insulin secretory defect on the background of insulin resistance" (ADA, 2009, p. 1514). The ADA currently recommends three means of diagnosis: 1) fasting plasma glucose of ≥ 126 mg/dl, 2) symptoms of hyperglycemia and plasma glucose of ≥ 200 mg/dl, or 3) two hour plasma glucose of ≥ 200 mg/dl during an oral glucose tolerance test. While type 2 diabetes has typically been considered adult-onset diabetes and diagnosed in adulthood, the recent increase in the incidence for adolescents has led the ADA to suggest earlier screening for the disease: however, the majority of those diagnosed continue to be adults, which is the focus of this review.

Once type 2 diabetes has been diagnosed, the ADA (2009) recommends management through glycemic control by glucose monitoring and HbA1c tests. Based on previous research, the ADA currently suggests the general goal of an HbA1c of < 7% unless patients have a history of significant co-morbidities and/or longstanding diabetes, where a less stringent management marker might be more reasonable. Glucose control along with blood pressure control, control of lipids, and preventative care practices are important since they are strongly tied to the many complications of diabetes (CDC, 2008). Some complications include: heart disease, stroke, hypertension, kidney disease, nervous system disease, amputations, dental disease, difficulty getting pregnant or having a full-term pregnancy, coma, and possibly mortality. To prevent complications, the ADA suggested initial and ongoing comprehensive care, which incorporates a disease management plan generated through an individualized provider(s)-patient/family alliance.

This awareness and management of diabetes has become a key focus since diabetes was ranked the seventh leading cause of death in the United States (CDC, 2008). In fact, recent statistics show 17.9 million individuals in the United States were diagnosed with diabetes while a staggering 5.7 million were believed to be undiagnosed (CDC, 2008). Using data from the National Health Interview Survey and the Bureau of Census population demographic projections, the burden of diabetes is estimated to reach 29 million cases by 2050 (Boyle et al., 2001). However, the burden of this diagnosis is not evenly distributed, since disparities exist in prevalence and complications for those in underserved groups (CDC, 2008; Egede & Dagogo-Jack, 2005; Hogan, Dall, & Nikolov, 2003; Miech, Kim, McConnell, & Hamman, 2009). The current epidemic of type 2 diabetes, especially among these groups, has influenced recent researchers' inquiries and guides the aims of this review.

Aims of Literature Review

This review aims to: 1) analyze research-based literature directed toward the management of type 2 diabetes among underserved populations; 2) identify notable differences between subgroups of underserved patients by ethnicity, sex, marital status, and/or age; and 3) apply a biopsychosocial-spiritual framework in organizing the research literature to identify themes and gaps in knowledge.

Underserved Populations

While the prevalence of diabetes continues to increase in America, it seems to be particularly troublesome for underserved populations. For the purposes of this literature review, underserved populations are defined as those having insufficient resources to meet their healthcare needs. This classification was based upon the definition by the United States Department of Health and Human Services in the Health Resources and Services Administration's Policy Information Notice 98-23: Health Center Programs Expectations (1998). It read:

> Underserved populations include all people who face barriers in accessing services because they have difficulty paying for services, because they have language or cultural differences, or because there is an insufficient number of health professionals/resources available in their community. Underserved populations also include people who have disparities in their health status. (¶ 2)

Thus, the present literature review includes data related to adults who are diagnosed with type 2 diabetes and their families who were uninsured, low income, members of a racial and ethnic minority group, of a lower educational level, and/or who were elderly. For the purpose of this review, the demographic labels assigned to minority groups will be written as found in the actual references.

The CDC (2008) recently highlighted the growing disparity between majority and minority ethnic groups. Of those over 20 years of age, the 2007 National Diabetes Fact Sheet indicated 9.8% of all non-Hispanic whites and 14.7% of all non-Hispanic blacks have diabetes. Projected prevalence rates for 2020 foretell continued disparities with a

107% increase for Hispanics and a 50% increase for African Americans, compared to only 27% increase for Caucasians or non-Hispanic whites (Hogan et al. 2003).

A number of studies exist documenting the elevated diabetes complications for minority populations. For instance, African Americans and Mexican Americans had higher rates of moderate to severe retinopathy than Caucasians (Harris, Klein, Cowie, Rowland, & Byrd-Holt, 1998). The rates of end-stage renal disease and lower extremity amputation were also two to three times higher in minority groups with diabetes when compared to Caucasians with diabetes (Lavery et al., 1996; Rostand, Kirk, Rutsky, & Pate, 1982). Furthermore, the CDC (2008) reported mortality rates for Hispanic Americans, Native Americans, and African Americans double to triple those of non-Hispanic whites.

The disparity among those with lower educational levels has recently been confirmed in a longitudinal study (Miech et al., 2009). Miech et al. explored the growing disparity in diabetes-related mortality using United States Vital Statistics and United States Census Data paired with Nutrition Examination Survey data. These researchers used data from 1989 to 2005 for those aged 40-79. Mortality among individuals with less than a high school education increased between 40 to 75%; whereas the mortality among individuals with a college degree decreased between 7 and 15%. The authors hypothesized this disparity in outcomes, which spanned over approximately two decades, occurred “by a quicker pace of improvement in diabetes-related factors among people with higher versus lower education” (p. 130). In particular, those with more education might be earlier consumers for novel, innovative disease management strategies or technologies and have greater financial resources compared to those with lower education.

Socioeconomic trends are also disconcerting. Data from 4,978 individuals in the Third National Health and Nutrition Examination Survey documented poverty income ratio, or annual family income divided by the general poverty line, was predictive of prevalence of diabetes among African American and Caucasian women (Robbins, Vaccarino, Zhang, & Kasl, 2001). This trend was also present for men, but did not achieve statistical significance. Socioeconomic factors have also been shown to impact medication adherence. In one study, 43% of African Americans stopped using prescribed insulin because of financial concerns (Musey, Lee, Crawford, Klatka, McAdams, & Phillips, 1995). This is concerning since nonadherence to insulin regimens seriously impacted diabetic glycemic control and precipitated subjects being diagnosed with diabetic ketoacidosis (Musey et al., 1995).

Limited access to health care, particularly among the uninsured, has also been associated with what Zhang, Geiss, Cheng, Beckles, Gregg, and Kahn (2008) referred to as being a “missing patient”. They found the incidence of undetected diabetes was significantly associated with being uninsured or being without insurance for longer than one year. When detected, other researchers have noted higher mean HbA1cs among uninsured when compared to those with insurance, 8.1% and 7.5% respectively (Benoit, Fleming, Philis-Tsimikas, & Ji, 2005).

Specific to North Carolina, Bell et al. (2001) recently reported data on the quality of health care for the underserved. Medical record data abstractions occurred at 11 different clinics serving low income, rural, minority, and/or elderly populations. Quality indicators included HbA1cs, foot exams, eye exams, blood pressures, among others. Results indicated:

> A large group of mostly low-income patients with diabetes in North Carolina are not receiving adequate care, as defined by the ADA and national performance measurement systems, to reduce the likelihood of developing complications of the disease. For many of the indicators noted in this study, less than half of patients had documentation in their medical chart that these procedures had been performed, or that even conservative treatment goals had been reached. (p. 128)

Rates of compliance among healthcare providers ranged from very high (77.9% for blood pressures) to very low (3.3% for foot exams). Interestingly, Bell et al. found few ethnic differences apart from blood pressure control, which was less commonly assessed among minority groups, while nephropathy assessments were more commonly assessed. These findings are noteworthy since nonadherence to preventative standards increases the likelihood of short and long term complications and may widen the divide between nonunderserved and underserved groups (Bell et al., 2001). While countless researchers have addressed barriers to care, health disparities, and/or quality of care, fewer have worked toward finding solutions that are based in recommendations from professional organizations, such as the Institute of Medicine and American Diabetes Association. These organizations endorse comprehensive approaches to research and clinical practice.

Institute of Medicine and American Diabetes Association

Recently, the Institute of Medicine (IOM, 2001) and the ADA (2009) released recommendations for clinical practice and bridging the gap of quality care, which may be particularly relevant for underserved patients with diabetes. In 2001, the IOM released six aims for improvement in health care, which include safe, effective, patient-centered, timely, efficient, and equitable care. Although these aims were tailored to a broad-spectrum of health care concerns, many of the suggestions are appropriate for a system hoping to meet the needs of underserved patients with type 2 diabetes and their families. In brief, the IOM's *Crossing the Quality Chasm* report suggested unified, respectful care that supports patients' preferences. Through their suggestions, these goals would be best achieved through evidence based treatment delivered in a timely manner. This care would also maximize energy or materials, thereby reducing waste. Relevant to underserved patients with diabetes, the IOM stated, "effective care of the chronically ill should be a collaborative process" (p. 27) and further elaborated that systems should "provide care that does not vary in quality because of personal characteristics such as gender, ethnicity, location, or socioeconomic status" (p. 6).

Building upon the IOM's (2001) broad recommendations for operational and clinical change, the ADA (2009) recently published *Standards of Medical Care in Diabetes*. The ADA's standards of care cover an extensive landscape of clinical care, including classification, diagnosis, monitoring, prevention, glycemic control, diet, physical activity, and complications, among others. One key feature of their standards involves an assessment of psychosocial problems during a comprehensive diabetes evaluation and referral to a mental health professional when needed. The ADA elaborated with the following recommendations:

> 1) Assessment of psychological and social situation should be included as an ongoing part of the medical management of diabetes; 2) Psychosocial screening and follow-up should include, but is not limited to, attitudes about the illness, expectations for medical management and outcomes, affect/mood, general and diabetes-related quality of life, resources (financial, social, and emotional), and psychiatric history; 3) Screen for psychosocial problems such as depression, anxiety, eating disorders, and cognitive impairment when adherence to the medical regimen is poor. (pp. S26-S27)

Using these aims and standards set forth by the IOM and ADA, it seems that best practice is moving toward a comprehensive model for disease assessment and management. The biopsychosocial-spiritual approach is one framework used in conceptualizing disease management.

Biopsychosocial-spiritual Framework

In many ways, biomedical thinking has been predominant in the treatment of disease. In reaction to this biomedical focus, George L. Engel developed the biopsychosocial model in 1977 as a way to comprehensively look at disease management. He believed this model would advance patient care since it includes biological as well as psychological and social elements. For example, managing a patient’s diabetes through only biomedical interventions, such as oral medication and insulin, might not be enough to counterbalance the influences of stress. According to

Engel, cellular changes may lead to societal ones and vice versa, hence the epidemic of obesity and diabetes in the United States.

Wright, Watson, and Bell (1996) highlighted the critical role they believed individuals' spirituality plays in the disease management process. To better understand this construct, a common distinction between religion and spirituality is necessary. Religiosity includes personal beliefs, community affiliation, and organized practices; whereas spirituality refers to the more abstract concept of a higher power that aids in finding meaning (Schlehofer, Omoto, & Adelman, 2008). For some patients these concepts may be mutually exclusive, while for others they are intertwined. In the present review, research studies on both spirituality and religiosity were included. Wright et al. stated, "At no time are family and individual beliefs more affirmed, challenged or threatened than when illness emerges. Consequently, how families adapt, manage, and cope with illness arises from their beliefs about the illness that is confronting them" (p. 23). They acknowledged that the experience of coping with an illness, such as diabetes and any psychosocial co-morbidities, impacts our outlook, beliefs, and actions. Thus, while researchers work to uncover the biological markers of disease, inclusion of psychological, social, or spiritual components might help in furthering our understanding of this chronic illness for underserved groups. We used the framework provided by Engel and Wright et al. to focus this review on the comprehensive experiences of underserved groups in their management of diabetes.

Method of Review

Search strategy. Two strategies were employed during this non-systematic review of the literature. The first was to identify relevant research using the following electronic databases: Medline via Ovid, Medline via PubMed, PsycInfo, and Psychological and Behavioral Sciences Collection**.** Only studies spanning from approximately 1995 to February 2009 that related to some aspect of the biopsychosocial and spiritual experiences of underserved individuals with type 2 diabetes were incorporated. This time period was selected to capture the most updated, relevant data pertaining to underserved groups. The following key words formed the list of search terms: ‘underserved’ and ‘diabetes’ paired with ‘glycemic control,’ ‘disease management,’ ‘psychological,’ ‘depression,’ ‘social,’ ‘support,’ ‘spirituality,’ ‘religion,’ ‘biopsychosocial,’ and ‘health disparity.’ For the second search strategy, the reference lists for each retrieved article were reviewed for additional pertinent studies that may meet the inclusion criteria.

Study selection and inclusion criteria*.* The literature search identified a number of potentially relevant articles. The titles and abstracts of these articles were reviewed resulting in approximately 138 articles for full text review. Of all the studies reviewed, 44 met the inclusion criteria. The inclusion criteria were: 1) research studies published in English, 2) from peer reviewed journals, 3) with adults 18 or older, 4) diagnosed with type 2 diabetes, and 5) whose sample or significant portion of sample met researchers’ criteria for belonging to an underserved population. The time span of 1995 to February 2009 was selected to allow observation of trends that may have influenced research on type 2 diabetes management among underserved, adult populations. However, one study published in 1994 was included from outside of the time period parameters due to our approximate, but not stringent cut off. Exclusion of research studies occurred when the focus was on: exclusively nonunderserved groups, collaborative care program outcome studies (although reference lists for some were explored), and studies focusing principally problems with on access to care.

Summary of Reviewed Studies

Three themes resulted from the literature review process: 1) psychological influences, 2) marital, familial, and environmental influences, and 3) spiritual influences impacting disease management for underserved patients. A table has been constructed at the conclusion of this article highlighting the sample, setting, instruments, method, results, and which elements of the biopsychosocial-spiritual framework were included for each study included in this review. Details of researchers' findings paired with critiques are integrated under each thematic description.

Psychological influences. While there may be a variety of psychological implications of type 2 diabetes, depression has been the most researched co-morbid diagnosis. Thus, the majority of information provided under this theme was centered on depression's influence on diabetes management. A total of 24 studies were reviewed, including a number of meta-analyses (Anderson, Freedland, Clouse, & Lustman, 2001; De Groot, Anderson, Freedland, Clouse, & Lustman, 2001; Lustman et al., 2000). Since a number of these meta-analyses included only a subset of underserved groups, findings should be cautiously applied.

Lustman et al. (2000) explored the relationship between depression and glycemic control in a review of 2,817 participants across 24 studies. From the meta-analysis, the authors ascertained a significant association between depression and hyperglycemia (Z = 5.4, $p < .001$,). Due to the small effect size, researchers suggested additional studies exploring this association. Specifically, research pertaining to the mechanism and direction (depression predicting hyperglycemia or vice versa) of the association may be particularly helpful (Lustman et al., 2000). In the aforementioned study, inclusion of several studies dedicated to individuals with type 1 diabetes and nonunderserved groups restricts some applicability to the present review. However, insertion of these findings is still important as researchers incorporated studies of individuals with type 2 diabetes who would likely be classified as underserved. Thus, the conclusions of this and other meta-analyses offer a foundational understanding of the interrelatedness of depression and glycemic control. Lustman's findings were the first of several meta-analyses on depression and diabetes that would immediately follow (Anderson et al., 2001; De Groot et al., 2001).

In a second meta-analytic study done by Anderson et al (2001), 42 studies met their inclusion criteria with approximately half including a non-diabetes comparison group. They found the odds of depression for the groups with diabetes were double that of groups without diabetes (OR = 2.0, 95% CI 1.8-2.2). Exploration of sex differences revealed 28% of women with diabetes reported depression, while a significantly lower proportion of men with diabetes (18%) documented these symptoms. Further exploring the presence of depression for those with diabetes, Ali et al. (2006) conducted a systematic literature review and meta-analysis exploring the co-morbidity of diabetes and depression. They analyzed ten controlled studies from 1980 to 2003 including 51,331 individuals, which showed significantly higher prevalence rates of depression amongst individuals with type 2 diabetes when compared to individuals without diabetes. Specifically, the percentage of depressed with diabetes was 17.6 versus 9.8 among those without diabetes (OR = 1.6, 95% CI 1.2-2.0). This investigation did include some analysis of underserved cohorts as three studies pertained to minority groups (African American and Hispanic), while seven included some percentage of those who were ≥ 65 years of age; however, no data was available for financial or educational demographics.

In an effort to find out exactly what impact depression has on populations with and without diabetes, De Groot et al. (2001) expanded the association between diabetes and other co-morbid conditions when they analyzed 27 studies (N = 5,374). They found significant associations between depression and diabetes complications ($Z = 5.94$, $p < .001$), including retinopathy, nephropathy, neuropathy, macrovascular complications, and sexual dysfunction, with a small to moderate effect size. For the meta-analyses discussed thus far, researchers confirmed that for underserved populations with diabetes, as well as nonunderserved populations with diabetes, prevalence rates of depression were generally higher than for diabetics, with depression often acted as one catalyst towards serious biomedical consequences.

In other studies, the presence of depression has been linked to problems with self-care, higher health care costs, and even mortality (Ciechanowski, Katon, & Russo, 2000; Katon et al., 2005; Lin et al., 2004). Ciechanowski et al. found among their sample of

367, including some elders with diabetes, that participants with medium to high levels of depression reported more difficulty when compared to those within the lower level depression group. Specifically, the impact of depression on care revealed those with a higher severity of depression were significantly less adherent to diet type and amount, less adherent to oral hypoglycemic medications, had poorer mental and physical health, and greater health care costs related to primary care, emergency department, medical inpatient, and mental health care when compared to those in the lower groups.

Comparing depressed to non-depressed patients with type 2 diabetes, Lin et al. (2004) evaluated 4,839 self-report questionnaires from a large HMO in Washington state. Demographically, one-fifth of this sample belonged to a minority group (8.3% African American and 9.3% Asian American); however, three-quarters of the sample reported some college education and no socioeconomic data were collected. A weakness of this investigation was a lack of specific data regarding education and income. In this investigation, participants who reported symptoms of depression were significantly less likely to adhere to a healthy diet, exercise, or not smoke tobacco when compared to those without depressive symptoms. However, no significant group differences were found among depressed and nondepressed participants in glucose monitoring or foot checks.

Despite the growing body of research, minimal data exists charting the contributors to depression for those with type 2 diabetes. Some have suggested that BMI, adherence to recommended self-care activities, and self-efficacy play key roles (Sacco, Wells, Vaughan, Friedman, Perez, & Matthew, 2005). Sacco et al. (2005) studied 56 individuals with type 2 diabetes (82% Caucasian, 9% Hispanic, 7% African American, and 2% Asian American). They found adherence to self-care activities, BMI, and self-efficacy were significant independent predictors of depression. In addition, mediation analysis revealed self-efficacy mediated the relationship between adherence and depression ($Z = -2.08$, $p < .05$) and BMI and depression ($Z = 2.17$, $p < .05$). These researchers concluded that lower self-efficacy, due to not adhering to care recommendations or high BMI, significantly contributes to depression among individuals with diabetes.

No matter the mechanism, research detailing the possible implications of depression on mortality is disconcerting (Katon et al., 2005). Katon et al (2005) followed 4,154 patients of a similar demographic as Lin et al. (2004) to detect trends in mortality over three years. After adjusting for demographics, minor depression was related to a 1.67 increase in mortality compared to those without depression, while this number jumped to a 2.30 increase in mortality when those with major depression where compared to those without depressive symptoms. One weakness of this investigation was the lack of data on causation of death for those with diabetes; thus, it is unknown if participants died of diabetes complications, lack of self-care, suicide related to psychological distress, or other mechanisms. Another limitation pertained to the lack of socioeconomic data and mostly Caucasian sample, which limits the generalizability for minority, underserved groups. Nevertheless, these findings do bring attention to the consequences of co-morbid depressive symptoms among individuals with diabetes.

The above mentioned studies focusing on depression were included in this review since they provided a foundational understanding of the association between depression and diabetes. However, these studies may not be entirely reflective of underserved groups, as only a subset of their samples met one or more of the criteria for “underserved” set forth by the United States Department of Health and Human Service’s (1998) classification. Trends in mental health and diabetes have recently been explored for populations reflective of the underserved categorization.

When the relationship between depression and diabetes management was explored among 209 Hispanic men and women, researchers found a significant, dose-response relationship of depression to poor disease management, such that the probability of poorer glycemic control increased with the severity of depression (Gross et al., 2005). In this study, 33.5% of Hispanic patients with diabetes met the criteria for moderate to severe depression, while 55.7% of those in this depression category had an HbA1c of greater than or equal to 8. These rates of depression were much higher than those detailed by Ali et al. at 17.6% in their meta-analytic study, which only included a portion of underserved in the analysis. When Gross et al. explored the presence of anxiety for Hispanic participants, 18.2% had a current anxiety disorder; however, anxiety was not related to poorer glycemic control when modeled as a categorical yes or no variable. The increased psychological distress of Hispanic patients diagnosed with type 2 diabetes is worrisome since only 41.4% of participants in one study with moderate to severe depression received any mental health services within the last year (Gross et al., 2005). The absence of mental health services may be partly related to the under-detection of depressive symptoms among underserved populations. In fact, Bazargan, Bazargan-Hejazi, and Baker (2005) addressed differences between self-perceived and professionally diagnosed conditions among ethnic minorities, finding that depression was the most common condition not detected by physicians among patients with chronic conditions. Attempting to understand why, researchers concluded in a recent review that under-recognition of depression was related to differences in language, barriers to health literacy, somatic complaints, and cultural expressions of distress (Lewis-Fernandez, Das, Alfonso, Weissman, & Olfson, 2005).

Underdetection of depression among Hispanic minorities may be especially troubling, as the co-morbidity of depression and diabetes among 2,489 Mexican Americans studied has been shown to be predictive of greater aversive health outcomes and ultimately an increased risk of mortality (Black, Markides, & Ray, 2003). In fact, these researchers found diabetic participants with high levels of depression were three times more likely of having died compared to diabetic participants without high levels of depression (OR = 4.03 compared to OR = 1.36). Similarly, in a later study of older Mexican Americans using multivariate analyses, the interaction of depression and diabetes predicted greater mortality, complications, and difficulty in activities of daily living than either depression or diabetes alone (Black, Markides, & Ray, 2003).

While depression has been highlighted as a risk factor in the worsening of glycemic control and complications (Anderson et al., 2001; De Groot et al., 2001; Lustman et al., 2000; Gross et al., 2005), this finding may not be consistent for underserved groups. Trief, Morin, Izquierdo, Teresi, Eimicke, et al. (2006) studied depression and glycemic control among 1,665 elderly, ethnically diverse participants. At baseline, these researchers found a small, significant relationship between depression and

HbA1c (*r* = 0.104). However, neither baseline nor prospective analyses of depression significantly predicted changes in HbA1c. Of note, glycemic control had limited variability in this study, which may have influenced the ability to detect a significant predictive relationship. These researchers suggested future research investigating the impact of depression on other constructs, such as BMI and quality of life. An earlier group of researchers who studied 183 African Americans also found a lack of significance between depression and HbA1c (*p* = 0.104), furthering the questionability of associations between the depression and glycemic control for minority groups (Gary, Crum, Cooper-Patrick, Ford, & Brancati, 2000).

Even among the statistically significant above mentioned studies, caution may be warranted in assuming clinical depression from high levels of depressive symptoms. When Fisher et al. (2007) assessed 506 patients for major depressive disorder using structured interviews paired with the Center for Epidemiological Studies Depression (CES-D) Scale (Radloff, 1977), 70% of those meeting questionnaire cut off points for depression were not clinically depressed in the diagnostic interview. These researchers suggested that many questionnaires assessing depression might be better estimates of diabetes-specific distress or subclinical depressive symptoms instead of a formalized major depression diagnosis.

Recent researchers have expanded the narrow focus on depression by exploring locus of control, self-efficacy, and outcome expectancy among medically underserved groups (O'Hea, et al., 2009). O'Hea et al. studied a mostly African American cohort from a medically and socially underserved area of Louisiana with an approximate 51%

indigent population. Using hierarchical regression analysis, their model incorporating all variables (age, sex, race, outcome expectancy, internal locus of control, and self-efficacy) accounted for 41.2% of the variance in HbA1c. Researchers concluded that those participants with lower self-efficacy and lower outcome expectancy benefited from higher degrees of internal locus of control.

Peyrot, McMurry, and Kruger (1999) did not solely explore depression either, but instead used a biopsychosocial model of glycemic control in diabetes, including stress, coping, and regimen adherence. Interestingly, only self-control and BMI were significantly related to glycemic control for participants with type 2 diabetes, but the relationship of coping to glycemic control was significant when stress and adherence to the diabetes regimen were controlled. This study was the only manuscript found that specifically used the term “biopsychosocial” paired with “glycemic control” in the title. While this study might be less relevant for underserved populations, researchers can extrapolate strategies to assess psychological well-being other than depressive measures. This was one of a few studies included in the literature review that investigated a comprehensive approach to diabetes management.

Other researchers applied a similar framework to their study of diverse patients with diabetes (Kaholokula et al., 2003). Kaholokula et al. (2003) analyzed data from the Native Hawaiian Health Research Project using biological, psychosocial, and sociodemographic variables. These researchers presented a number of literature critiques similar to the present study, stating current literature does not 1) examine the interaction effects of sociodemographic variables with depression and diabetes, 2) control for biological variables (BMI), or 3) include underrepresented groups. Their study sought to meet these aims by studying 146 Hawaiian/part-Hawaiian, Filipino American, Japanese American, Caucasian, and others of mixed ancestry with diabetes mellitus. When examining the proportion of variance in depressive scores accounted for by HbA1c while BMI was held constant, results fell short of significant, suggesting that changes in depression were not significantly accounted for by glycemic control in this study. However, when two regression models were compared, the model including health related quality of life (HRQOL) did account for a significant amount of variance in depressive scores when compared to a model without HRQOL ($R^2_{\text{diff}} = -.16$, $p < .001$). Similar research should be replicated to include other underserved cohorts, such as African Americans and Hispanics of low income or education level, documenting the trends between glycemic control, BMI, depression, demographics, and quality of life.

Another study that looked at diabetes management and psychological well-being from a comprehensive perspective was done by Samuel-Hodge et al. (2000). Seventy African American women with type 2 diabetes were qualitatively studied to assess the influences on their day to day management of the disease. Focus groups revealed that serving in the "multi-caregiver role" or taking responsibility for providing emotional or tangible support for family, friends, and others was a consistent theme. While this theme did not specifically point to depressive symptomatology, it may be an important contributing variable associated with increased psychological co-morbidities as participants described themselves as tired, stressed, and pressured from their caretaking responsibilities. Serving as a constant caregiver may also be considered a characteristic of social influences on disease management, which might include immediate family, cultural, or communal factors.

Many of the above mentioned researchers and others have begun to explore differences in the presence or experience of co-morbid depression and diabetes according to age, sex, marital status, geographic location, and/or ethnic group (Ali et al., 2006; Black & Markides, 1999; Black et al., 2003; Coffman, 2008; Fisher et al., 2001; Fisher et al., 2004; Fisher et al., 2007; Gross et al., 2005; Kaholokula et al., 2003; Katon et al., 2004; Lin et al., 2004; Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). It seems certain populations may be more at risk for the depression-diabetes link. Katon et al. (2004) recently explored group differences according to a number of demographic and clinical factors. Among 4,193 participants, 12% met the criteria for major depression while 8.5% met the criteria for minor depression. The prevalence of major depression was significantly greater in those who were younger, female, less educated, unmarried, with a higher BMI, smokers, treated with insulin, greater nondiabetic medical co-morbidities, men with a number of complications, and older patients with higher HbA1c scores. The prevalence of minor depression was significantly greater in those who were younger, minority status, less educated, with a higher BMI, and who smoked tobacco. Interactions were statistically significant with age modifying the relationship between major depression and HbA1c, while sex modified the relationship between complications and major depression. Interestingly, men with depression had twice the rate of numerous complications compared to men without depression while this relationship was not present for women. While this study was reported as the largest HMO population based survey of depression among patients with diabetes, these findings may be somewhat limited due to the self-report nature of data and limited geographical diversity.

Trief, Morin, Izquierdo, Teresi, Starren, et al. (2006) found a number of similar correlates to depression, including those who were younger, female, Hispanic minority, never married, less educated, insulin users, tobacco smokers, who had more medical co-morbidities, and more diabetes related symptoms. Interestingly, they also found Caucasian participants reported high levels of depressive symptoms, contrary to Katon et al (2004). When these researchers explored demographic predictors of higher HbA1c, the findings were much different, including many opposite demographics as those related to depression. Predictors of high HbA1c included those who were male, Caucasian, more educated, insulin users, poorer activities of daily living, more years of diabetes, and who had more diabetes related symptoms. Thus, when comparing depression versus glycemic control, demographic predictors (sex, ethnic group, and educational level) were contrary.

Other researchers have purposely examined differences according to ethnicity or sex. Fisher et al. (2004) studied four ethnic groups diagnosed with type 2 diabetes, including European Americans, Hispanics, African Americans, and Chinese Americans. The total mean rate of likely clinical depression was 25.9% among their participants, ranging from 14.5 to 34.4% depending upon ethnic group. Significant differences ($F = 3.42$, $p = 0.02$) were found in depressive affect according to ethnicity, such that Chinese Americans and Hispanics had the highest scores while European Americans and African Americans had the lowest scores of depressive affect. When educational level and income were controlled, differences in depressive affect scores no longer reached statistical significance (*F* = 1.07, *p* = 0.12).

When sex differences were examined, there was no statistically significant difference in depression scores for males and females in any ethnic group (Fisher et al., 2004). Coffman (2008) also found no significant difference in the percentage of depressed men and depressed women, shown by 37.2% and 37.5% respectively. Interestingly, this is contrary to other researchers (Ali et al., 2006; Gross et al., 2005; Katon et al., 2004; Lin et al., 2004) who often cite women with type 2 diabetes from underserved groups as being more likely to exhibit depressive symptoms. In addition, low-income women have been shown to have high rates of anxiety and self-reported poor to fair physical health as well (Gross et al., 2005). While much of the literature is used to support the premise that women may have or report having greater symptoms of depression than their male counterparts, few or no differences in some studies call for more research examining differences among the sexes.

Other researchers have studied the contributors to depression and anxiety according to majority and minority cohorts, specifically among Latino and European American patients diagnosed with type 2 diabetes (Fisher et al., 2001). Fisher et al. found lower educational levels, functional impact, and financial stress were significant predictors of depression, while only functional impairment and financial stress were significantly predictive of anxiety for the groups. Spousal conflict was a significant predictor of depression for European Americans, but not Latinos. These researchers suggested that many demographic and social factors seem to interact to influence depression and anxiety among these populations. Research exploring underserved group differences seems to be an unchartered, inconclusive area of research since conflicting results are common in the literature.

Marital, familial, and environmental influences. The 13 articles reviewed in this section addressed both unhelpful and helpful implications of marital, familial, and other social involvement in diabetes care management. Specifically, researchers have examined the following areas: the role of health care providers, the role of relationships within the nuclear family system, and the role of relationships and larger societal interactions occurring outside the nuclear family system. Each of these areas is detailed throughout this subsection.

Researchers have found that social support may be derived from multiple sources; for instance, researchers studying African Americans found 43% identified their physician as the primary support source, 20% identified their spouse, and 19% identified a family member (Tang et al., 2008). Health care professionals have been identified as a source of support for Hispanic patients also, where 64.2% would turn to a nurse for help, 33.7% would turn to an agency, and 24.2% would turn to a home health aide (Gleeson-Kreig, Bernal, & Woolley, 2002). When provider support was examined for a low income, ethnically diverse sample of 956 patients, approximately 87% of the sample reported positive feelings about the level of support given by their provider, leaving 13% with negative assessments (Greene & Yedidia, 2005). Using multivariate analysis, participants with positive assessments were more assured in their abilities to provide quality self-care, which translated to a greater engagement in self-management tasks (healthy eating, exercise, testing blood sugar, checking feet) compared to those with negative assessments.

Among underserved groups, other researchers have found higher patient trust in their physicians was predictive of lower levels of hassle with the disease, enhanced ability to complete recommended care plans, and improved capability to care for diabetes in general (Bonds, Camacho, Bell, Duren-Winfield, Anderson, & Goff, 2004). Thus, it seems that providers' psychosocial support has particular bearing on disease management behaviors and care quality for underserved patients with type 2 diabetes. Unfortunately, these researchers did not assess patient-centered care directly through their measures and did not address many possible mediators in their methodology, including self-efficacy and educational level (Bonds et al., 2004). Beyond supportive behaviors at the provider-patient level, researchers are beginning to understand the role of family in diabetes care.

Coffman (2008) found Hispanic older adults in one study were more likely to report family members, including spouse or relative (46.4%), as the primary source of support versus social programs (28%) or medical professionals (17.6%). She found among 115 mostly Puerto Rican elders (*M* age = 69.3) that family members were often used as sources of tangible support, for such things as shopping, running errands, attendance at visits, or talking with health care providers. Gleeson-Kreig et al. (2002) previously documented tangible types of support (transportation and interpretation) from family as the most satisfactory and needed among a group of 95 Hispanic adults. In Coffman's study, this form of support was significantly negatively related with self-efficacy, such that those with more tangible support from family have lower confidence in their abilities, and significantly positively related to depression, such that the amount of needed tangible support increased with level of depressive symptoms. Perhaps, one hypothesized reason might be an overly present family unit increases feelings of apathy and depression among the individual with diabetes; though, future research would be needed to examine the exact mechanisms of this relationship. The landscape of literature addressing the nuclear family system has begun to address relational themes, especially among couple or spousal roles.

When investigating the nuclear family system, Trief, Morin, Izquierdo, Teresi, Starren, et al. (2006) documented the implications of couple dynamics for diabetes care among 134 elderly Medicare beneficiaries in underserved areas who were participating in a randomized control trial of telemedicine case management. Sample composition included both type 1 and type 2 participants taking insulin, which excludes generalizability to those taking oral medications or managing their illness through diet and exercise alone. Researchers assessed marital satisfaction (happiness in relationship), marital stress (experience of particular emotions, such as tension, in relationship), blood glucose control, depression, diabetes-related distress, co-morbidities, and blood pressure. Results only showed small relationships, such that higher marital stress was positively correlated ($r = .201$) with poorer blood glucose control, while marital cohesion ($r = -.209$) and marital satisfaction were negatively correlated ($r = -.185$) to blood glucose control. Psychosocially, greater marital stress and lower marital satisfaction were also correlated with individual psychological health, increased depression, and distress related to diabetes. Similarly, Tang et al. examined these relationships, but reported stronger findings. Among 89 African Americans aged 40 and older with type 2 diabetes, negative support behavior was related to not taking medication as prescribed by the health care provider ($r = -.348$, $p < .01$). Conversely, satisfaction with social supports was a significantly related to quality of life ($r = -.579$, $p < .001$) and monitoring of blood glucose to a lesser degree ($r = -.258$, $p < .05$).

Qualitative inquiry, such as focus groups, have further documented the role of spousal support in food-related behavior change among middle-aged to older adults living with diabetes (Beverly, Miller, & Wray, 2008). While the mean age of 66.7 classifies this sample within the elderly subgroup as underserved, caution should be taken in the application of these results since the mean education reported was college and no socioeconomic or ethnic group data were reported. Nevertheless, the paucity of literature related to spousal support in health behaviors among the underserved required extrapolation of literature from other studies. Beverly et al.'s (2008) resulting thematic clusters highlighted reliance on spouse for control over food, necessity of spousal communication, interpersonal enhancement or limitation of coping, spousal knowledge or dietary competence, and level of commitment to support one another as critical in the spousal role. Similarly, quantitative investigation of African American groups using regression analysis revealed positive support behaviors were significantly predictive of following a healthy eating plan (Tang et al., 2008). Few known studies exist beyond these that have specifically investigated the influence marital support has on diabetes care for underserved cohorts; however, research has been done to explore the helpful and unhelpful aspects of family involvement in diabetes care for some minority groups, including African Americans and Latinos (Chesla et al., 2003, 2004).

As stated previously, family research has included those individuals within the nuclear family system, which may extend beyond the marital relationship. The family process literature includes investigations of family conflict, cohesiveness, and coherence. Chesla et al. (2003) found that elevated levels of unresolved conflict within the family predicted negative changes in diabetes management over a one year period for 57 Latino and 104 European American patients. Some researchers have revealed that among Latino families, higher levels of structure and organization, traditional gender roles, and optimistic beliefs contributed to better disease management (Fisher et al., 2000). Chesla et al. highlighted that cultural interpretations of coherence questions by Latino participants may be responsible for some findings in the study. This proposition underscores the importance of selecting measures that are culturally sensitive, reliable, and valid for minority and/or underserved groups. Thus, some findings may need to be cautiously applied to Latino patients given the lack of cultural consciousness used in measure selection.

When aspects of family life and diabetes management were studied for 159 African Americans, multivariate tests for the main effects of family structure (roles and rules), family world view (assumptions and beliefs), and family emotional management (expression and management of emotions) revealed significant associations with patient morale (Chesla et al., 2004). Furthermore, structural togetherness was significantly related to quality of life, while the family’s world view of meaningfulness and manageability were significantly positively associated with general health for the individual with diabetes. For African Americans, unresolved conflict was related to psychological symptoms of depression. Interestingly, Chesla et al. (2004) did not find an association between family measures and HbA1c, which may mean that the complexities of glycemic management cannot be explained by social variables alone; instead, diet, exercise, psychological status, BMI, among other constructs may need to be incorporated into analyses.

While past family process literature is valuable in highlighting the role of family for minority populations, some of this research must be cautiously applied to underserved groups. Specifically, some samples included participants with an average of 14 years education and average annual incomes of $40,000 (Chesla et al., 2004). While these researchers were studying minority populations, the educational level, socioeconomic status, or other resources might not be characteristic of those who may be underserved in accessing services, though might still fit within a health disparity classification due to ethnic minority status. In spite of limitations, these findings were helpful in generating a preliminary assessment of the family's role in diabetes management for minority and potentially underserved groups. Research has expanded beyond nuclear family involvement to include the social influences of organizations and neighborhoods (Bertera, 2003; Shaw et al., 2006). Much of this research has explored differences between groups according to ethnicity.

Bertera (2003) investigated social support among minority and majority adults ages sixty and older among three groups, those who had a diagnosis of diabetes, those who were unaware of elevated serum glucose, and those who did not have a formal diagnosis of diabetes. In her sample of African American and Caucasian groups (N = 6,529), she found significantly higher means of social support related to weekly telephone calls with family and friends (*M* = 11.9 African American and 11.0 Caucasian), visits with friends and relatives per year (*M* = 131.6 African American and 123.9 Caucasian), and attendance of club meetings per year (*M* = 71.7 African American and 17.2 Caucasian) when compared to Mexican American groups (*M* = 5.6, 58.7, and 8.4 respectively). However, Mexican Americans reported higher means of church attendance per year (M = 84.7 versus 59.9 African American and 42.8 Caucasian). When examining these ethnic group differences, groups were not discriminated according to diagnostic category (no diagnoses, not aware, aware), which may limit findings to underserved groups with a confirmed diagnosis of diabetes. In another study, participants over 70 years of age with higher levels of these types of social support (connection with friends, neighbors, social events, church, senior centers) had lower symptoms of depression, stress, bad days, and impairments in activities of daily living in the short term, while significantly decreasing the risk of death in the long term (Zhang, Norris, Gregg, & Beckles, 2007).

While these findings helped to illuminate the role of support in patients' lives, there are a number of limitations, including non-minority samples as 80 to 86.1% were non-Hispanic white (Bertera, 2003; Zhang et al., 2007). Additionally, the inclusion of participants who may be unaware of their diabetes diagnosis or who are in the pre-diabetes somewhat limits applicability (Bertera, 2003). A last limitation is Bertera's definition of social support as the number of phone calls, visits, or meetings reported by participants. However, it may be inappropriate to assume presence of personal contact might result in perceived social support; for instance, that visits with neighbors led to more emotional support delivered. Reflecting on these limitations, future researchers should include proportionate amounts of minority, underserved groups and purposefully ask about perceived and actual support.

Some researchers have begun the study of how social support from family, friends, community organizations, neighborhood, and other resources might influence adherence to diabetes self-care behaviors for underserved communities, both rural and urban (Shaw et al., 2006). Specifically, Shaw et al. used a structured survey instrument to assess support along with six self-care behaviors (dietary, foot care, monitoring of blood glucose, smoking, and physical activity. They found social support from family, friends, and neighborhood resources was predictive of adherence to suggested meal plans. Additionally, organizational support influenced monitoring of blood glucose, while adequate foot care was positively impacted by family, friends, and neighborhood resources.

Differences in subsamples (primarily white rural group and primary minority urban group) showed urban participants reported greater levels of support from family, friends, organizations, neighborhoods, and communities compared to rural groups (Shaw et al., 2006). Shaw et al. hypothesized that this may be related to a lack of socioeconomic resources in rural areas or an increased self-reliance in these geographical locations. Of note is the low internal consistency reliability of .44 on the Chronic Illness Resource

Survey (CDC, 2002) used within this study, which documents social and environmental support for self-care. This low reliability score paired with the 92.30% Caucasian sample in the rural group warrants caution when interpreting results and generalizing social implications to minority, underserved populations.

Beyond ethnic group and geographical location, some researchers have explored the role of sex in perceived social support. In one study of 89 older, African American participants, Tang et al. found men and married participants reported receiving significantly greater amounts of support than women or those who were unmarried. Specifically, men reported receiving significantly more positive support behaviors and greater satisfaction with support when compared to women. Perhaps, these trends of social support may be parallel to findings in other studies that women were more likely to experience depressive symptoms when compared to their male counterparts (Gross et al., 2005; Katon et al., 2004).

Given the few research studies for populations acknowledged as underserved, further exploration of the social support provided by marital partners, family members, friends, and/or organizations paired with implications for disease management or psychological well-being seems warranted. More studies comparing groups according to demographics may provide for a better understanding of possible similarities and differences among the biopsychosocial experiences of underserved subgroups (particularly by sex, marital status, age, and ethnicity).

Spiritual influences. Of the eight research studies reviewed, the spirituality literature predominately consisted of African American samples with type 2 diabetes;

however, some research has recently emerged related to the experiences of Caucasian and Hispanic underserved populations (Cooper et al., 2001; Polzer & Miles, 2005, 2007; Samuel-Hodge et al., 2000). To ensure transparency in methodological limitation, those studies whose researchers did not document demographics (age, income, educational level, etc.) beyond minority status were clearly identified. A number of researchers used qualitative methodologies to explore spirituality's role in biomedical or psychosocial health, which may related to the abstract nature of spirituality and religiosity (Polzer & Miles, 2005, 2007; Samuel-Hodge et al., 2000). These results may be difficult to generalize because of small sample sizes and limited geographic representations.

Some researchers have explicitly targeted the influence of both religious and spiritual well-being on HbA1c for African American women with type 2 diabetes (Newlin, Melkus, Tappen, Chyun, & Koenig, 2008). When demographics, BMI, and medications were held constant for the 109 participants, religious well-being and spiritual well-being accounted for a significant variance in HbA1c. However, diabetes-specific emotional distress partially mediated the relationships between this existential well-being and HbA1c. Otherwise, emotional distress or social support did not act as mediators in the relationship of religiosity or spirituality to glycemic control. Other researchers have qualitatively explored spirituality for groups of similar ethnicity and sex (Samuel-Hodge et al., 2000).

Samuel-Hodge and colleagues (2000) recruited 70 southern African American women to participate in a 90 minute focus group. These women had been diagnosed with type 2 diabetes for longer than one year and were recruited from local community health centers and university-based internal medicine practices. All ten focus groups had the consistent theme of spirituality or religiosity. Participants described God and church as important for coping and socialization. Church was specifically acknowledged as a venue to advance life satisfaction through peer or pastoral emotional support. Related to disease management, the women often asked God to help control the diabetes, commonly giving thanks for treatment without use of needles. This qualitative investigation provided a number of spiritual and religious implications for African American women; unfortunately, missing from the discussion was demographic data on participants beyond race, which limits the ability to conclude that findings are representative of underserved groups that may have limited access or adequate health care resources. Nevertheless, these findings were central in substantiating the role of spirituality for African Americans with diabetes. Other qualitative researchers have also supported the above mentioned conclusions (Polzer, 2007; Polzer & Miles, 2005, 2007).

Recently, the research landscape for spirituality has been expanded further for African American patients with diabetes (Polzer, 2007; Polzer & Miles, 2005, 2007). Polzer began her inquiry into African Americans use of spirituality through a literature review published in 2005. Her review of 55 articles and five books relevant to health and spirituality for the chronically ill revealed African Americans often turn to God for help with coping and/or relinquish control of health to God. Her review supported spirituality as both positive and negative manipulator of self-management depending on how a patient used faith. Due to the impact of spirituality for this minority population, she stated providers “must go beyond asking questions about religious preference and church attendance and, therefore, incorporate a more comprehensive spiritual assessment" (p. 241). Polzer and Miles did just this in 2007 by exploring spirituality and self-management using a grounded theory approach.

Polzer and Miles (2007) studied 19 African American women and 10 African American men with type 2 diabetes. These patients were of lower socioeconomic status, but were excluded from the study if they had other serious medical problems, which may have influenced the sample composition. Using minimally structured interviews, researchers found patients with diabetes often viewed spirituality's role in medical care in unique ways. In fact, they highlighted three distinct groups: 1) God in the background, 2) God in the forefront group, and 3) God as a healer. The background group often viewed themselves as the major facilitator of change and God as giving support in the background; thus, stressed the importance of self-management (Polzer & Miles, 2007). Polzer (2007) elaborated stating that these individuals tended to perceive usual care as being integrated with spirituality. The forefront group often believed God was the major change agent and took a submissive, background role in their self-management (Polzer & Miles, 2007). This group often focused on faith. Individuals who focused on God in the forefront wanted their provider to talk about spirituality since they perceived providers as instruments of God (Polzer, 2007). The final group highlighted by Polzer and Miles were the healers. These patients believed that if they had enough faith, diabetes self-management was unnecessary. The healer group viewed providers as spiritual partners who should support their efforts to relinquish care to God (Polzer, 2007).

While the distinction between groups was helpful in conceptualizing the spirituality of African Americans with diabetes and their health behaviors, it is important to note that these studies (Polzer, 2007; Polzer & Miles, 2007) only reflect the perspectives of 29 middle aged to older aged participants. Thus, the perspectives of the growing number of African Americans younger than 40 with type 2 diabetes, not to mention other races or ethnic groups, were not represented in these distinct spirituality groups. Methodologically, the majority of the researchers used qualitative inquiry in studying the role of spirituality; thus, future quantitative research might assist in further understanding spirituality's role as a mediating variable or key factor in disease management.

Some literature has emerged comparing differences or similarities in ethnic groups' use of spirituality. When African American primary care patients with type 2 diabetes were quantitatively compared to Caucasian counterparts using a cross sectional survey, African Americans were more likely than Caucasians to rank spirituality as important in their depression care (Cooper et al., 2001). Those items rated highly tended to be related to overall spirituality and had less to do with public religiosity, such as church attendance. Since Cooper et al.'s sample included numerous young, educated participants, these comparative findings might be dissimilar if duplicated for underserved populations of similar races.

Though the above mentioned researchers have not included demographic or descriptive data citing the underserved nature of their samples, some researchers have explicitly studied underserved minority groups. Zaldivar and Smolowitz's study (1994) included a sample of 104 predominately Medicaid insured individuals who had a mean education of fifth grade, and were originally from the Dominican Republic, Puerto Rico, Cuba, or Ecuador. The researchers used a self-report survey, revealing 78% of their sample believed they had diabetes due to God's will. Another 17% used herbal treatments for their condition. While the researchers established content validity (*r* = .82) on their evaluation tool, patients could only respond with "yes," "no," and "I don't understand the question." Of note, up to 24% of participants answered the "don't know" response depending upon the question, which may be reflective of a confusing or misread measure. Inquiry into herbal treatments was further explored by Hunt, Arar, and Akana, 2000.

Hunt et al. (2000) conducted open-ended interviews with 43 low income Mexican Americans with diabetes, finding herbs as a mentioned alternative treatment. Though, most participants had not utilized these treatments with any regularity. Many had relied on medical treatments and used alternative treatments as an adjunctive resource. In fact, none had used curanderos or traditional healers, but instead relied on personal prayer to combat stress and anxiety. These researchers concluded, "Although many of our participants said God is important in controlling their diabetes, they felt God works through the clinician and medications, not in place of them" (p. 221).

Similar to other studies addressing the influences on disease management, limited information on participant demographics was included in many of the spirituality-focused studies. Thus, for much of the research we cannot assume that since the sample was of a particular geographic region, race, or ethnicity that they were also underserved (lower socioeconomic, poor access to care, low education level, etc.); however, in some cases participants did meet one of the criteria (e.g., minority) and were included. Lack of demographic data and homogeneity of samples also limited comparisons according to ethnic group or sex. Also of note is the qualitative methodology used in the majority of spirituality research. While interviews, focus groups, and grounded theory inquiry were helpful in generating a comprehensive view of patients and their health experiences, quantitative studies will be essential to further understand and substantiate the ways spirituality influences health.

Implications for Research

The research recommendations are structured by the established findings and identified gaps in the existing literature. Three research recommendations are suggested by literature review: 1) further exploration of the relationship between psychosocial influences, including spirituality, on disease management (e.g. HbA1c or BMI); 2) examination of how social support and spirituality interrelate with psychological symptoms; and 3) investigation of demographic differences or similarities in the biopsychosocial experience.

Influences on disease management. Further research is needed to better understand the psychosocial and spiritual influences on glycemic control among underserved groups with type 2 diabetes. Thus far, some data are available to support the influence of depression on worse glycemic control, poorer diabetes outcomes, and mortality (Ali et al., 2006; Black & Markides, 1999; Black, Markides, & Ray, 2003; De Groot et al., 2001; Gross et al., 2005; Katon et al., 2005; Lin et al., 2004; Lustman et al., 2000). However, some of these researchers included individuals with type 1 diabetes and nonunderserved groups in their samples, (Ali et al., 2006; De Groot et al., 2001; Katon et al., 2005; Lustman et al., 2000). Others only addressed one underserved group in the investigation, limiting comparison or diversity among underserved subgroups (Black & Markides, 1999; Black, Markides, & Ray, 2003). Furthermore, Gross et al. identified the lack of confounding variables in their study, primarily BMI, but also use of psychotropic medications and smoking tobacco. Conflicting findings also exist as other researchers did not find any association between depression and glycemic control when studying African Americans or other elderly, underserved groups (Gary et al., 2000; Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). Thus, research that targets underserved groups incorporating confounding and mediating variables (i.e., BMI, social support, spirituality, demographics) and culturally sensitive measures is needed to map the relationship or lack of relationship between depression and glycemic control. This research should extend to a wide variety of ethnic groups to better conceptualize similarities or differences.

Subsequent researchers engaging in this inquiry should be cautious in labeling participants with specific psychopathology from screening tests. For instance, some researchers have found that up to 70% of those meeting questionnaire cut off points for depression were not clinically depressed in a standardized diagnostic interview (Fisher et al., 2007). Thus, instead of using depressed, researchers should use the term “depressive symptoms” to describe the constructs’ influence or insert a cautionary statement (Fisher et al., 2007). Qualitative studies might also assist in the conceptualization of patients’ lived experiences with type 2 diabetes. Most qualitative data to date centers on African American women’s psychosocial health; thus, other populations (uninsured, elders, underserved men, other minorities) should be included in subsequent investigations (Samuel-Hodge et al., 2000).

Researchers examining social supporters’ influences on disease management have found stress and conflict in relationships often results in depression and poorer diabetes management; however, many of these findings were only minimally related (Chesla et al., 2003, 2004; Trief, Morin, Izquierdo, Teresi, Starren, et al., 2006). Thus, future research is needed to further test how relational distress impacts diabetes management. While much of this literature is valuable, past researchers included minority populations without further sociodemographic data; thus, future research is needed to specifically target populations that meet multiple parameters of the United States Department of Health and Human Services’ (1998) definition of underserved.

Some research exists beyond the family system to health care providers and larger influences, such as family, friends, or church (Bertera, 2003; Bonds et al., 2004; Greene & Yedidia, 2005). Health care provider support and encouragement is associated with better self-care (Bonds et al., 2004; Greene & Yedidia, 2005), while support from family, friends, or church is often predictive of positive health behaviors, lower symptoms of depression, and decreased mortality (Bertera, 2003; Zhang et al., 2007). Coffman (2008) and Gleeson Kreig et al. (2002) documented the importance of family members in tangible support, such as driving, communicating with health care providers, and assisting with daily tasks for Hispanic populations, which may lead to better diabetes self-care and psychosocial health. The aforementioned studies serve as building blocks for successive research that may be used to comprehensively evaluate the influence of many supporters according to cultural preferences and the role of family in healthcare.

Most of our knowledge of spirituality currently extends from qualitative studies of African American groups, limiting the applicability to other groups (Polzer, 2007; Polzer & Miles, 2007; Samuel-Hodge et al., 2000). Though, some quantitative data exists pertaining to spiritual and religious implications for disease management (Newlin et al., 2008). These researchers documented that religious and existential well-being accounted for significant variance in HbA1c levels (Newlin et al., 2008). Conclusions from other researchers cite spirituality as important for coping, noting unique typologies through this process (Polzer, 2007; Polzer & Miles, 2007; Samuel-Hodge et al., 2000). Due to the limited diversity in methodology and sample composition alongside the paucity of research for the underserved, more inquiry is needed in this area.

As researchers move forward incorporating varied samples of underserved patients, they should value culture and community through selection of research instruments that are validated for use with the specific minority groups and sensitive to their unique strengths and challenges. Qualitative questions should be constructed with sensitivity to language, meaning, and culture as to how participants define and recognize the influences of the biopsychosocial-spiritual dimensions. Lastly, future quantitative research should learn from past researchers' comments, such as Gross et al. who called for integration of relevant confounding or mediating variables in examining relationships between variables.

Social and spiritual influences on psychological health. While the aforementioned research pertains to the psychosocial and spiritual influences on disease management, this seems to be only one part of exploring the interrelatedness of these dimensions for underserved groups. Future researchers could also build upon the known impact of social support and spirituality on psychopathology, such as depression, for underserved patients with type 2 diabetes. Of the research reviewed, qualitative investigation revealed themes of constant caretaking among African American women (Samuel-Hodge et al., 2000). Further examination of this "multi-caregiver" theme might provide insight into how the role might influence individuals' psychological well-being and subsequent disease management.

Other researchers have noted a number of variables that contribute to depression, including financial stress, functional impact, spousal and unresolved conflict, high marital stress, and lower marital satisfaction (Chesla et al., 2004; Fisher et al., 2001; Trief, Morin, Izquierdo, Teresi, Starren, et al., 2006). Limited data exists specifically exploring the social and spirituality influences on psychological well-being or distress. Future researchers exploring the varied aspects of social support (providers, friends, spouse, family, community) and spirituality (religious or existential) related to psychological status (depression, anxiety, etc.) would enhance our knowledge of the biopsychosocial-spiritual interplay. Additionally, the integration of satisfaction with life measure would aid in obtaining a general measure of subjective well-being, especially since relatively minimal data exists for this construct.

Group differences. While exploring the psychosocial or spiritual influences on diabetes management, a number of researchers have identified differences due to ethnic group, sex, marital status, and/or geographical location among the underserved (e.g., Bertera, 2003; Cooper et al., 2001; Fisher et al., 2001; Fisher et al., 2004; Katon et al., 2004; Tang et al., 2008; Trief, Morin, Izquierdo, Teresi, Eimicke, et al., 2006). Researchers reported Chinese Americans and Hispanics as having higher scores of depressive affect while European Americans and African Americans had lower scores on these measures (Fisher et al., 2004). Socially, African Americans and Caucasians showed greater support from family, friends, and clubs compared to Mexican Americans; although, Mexican Americans showed greater amount of support from church attendance (Bertera, 2003). When African Americans were compared to Caucasians, African Americans were more likely to rank spirituality as important in depression care (Cooper et al., 2001). Future research is needed to build upon the current literature of differences according to ethnic subgroups in underserved populations. Specifically, likeness and dissimilarities should be reported for experiences of depressive symptoms and other psychopathology, utilization of supporters, and significance of spirituality in medical or psychological care.

Some researchers have specifically explored the contributors to depression among those with diabetes (Fisher et al., 2001; Katon et al., 2004). These researchers have found a number of risk factors for the depression-diabetes link, including those who were younger, female, less educated, unmarried, and with poorer physical health (Katon et al., 2004). Other researchers documented lower education level, functional impact, and financial stress as predictors (Fisher et al., 2001). Future researchers should further investigate demographics in an effort to establish verifiable at-risk groups.

Sex differences tend to be inconsistent. Some researchers show no differences for depressive symptoms in the sexes (Fisher et al., 2004) while others cite women as having greater depressive symptoms (Gross, et al., 2005; Katon et al., 2004). Socially, Tang et al. found men reported significantly higher levels of support than women. Also, married individuals reported more support than those who are unmarried. Geographical differences show urban individuals tended to report greater levels of support than their rural counterparts (Shaw et al., 2006). These contradictory findings call for further exploration into how men and women uniquely or similarly live the biopsychosocial-spiritual experience of diabetes.

Implications for Practice

Practice based implications are influenced by the IOM's (2001) six aims for quality health care and ADA's (2009) recently released standards. The ADA recommended integration of psychosocial assessment and treatment into diabetes care; however, physicians have identified reluctance in incorporating psychosocial factors in medical treatment (Astin, Soeken, Sierpina, & Clarridge, 2006). Astin et al. (2006) found approximately one third of 1,058 medical providers surveyed believed that addressing psychosocial concerns would likely not improve outcomes. Interestingly, the findings from the present review identified a number of psychosocial and spiritual influences on diabetes care. Consequently, addressing the disease using a biopsychosocial-spiritual framework might improve glycemic adherence and overall health.

Since it may be overwhelming for any one provider to manage multidimensional needs independently, which may be one reason for reluctance to incorporate psychosocial concerns, team-based care might be a helpful way to manage the various aspects of functioning. In fact, the IOM suggests treatment of the chronically ill should be a collaborative endeavor. For instance, Robinson, Barnacle, Pretorius, and Paulman (2004) highlighted an interdisciplinary approach used in their diabetes clinic, including medicine, nursing, pharmacy, medical family therapy, and additional disciplines. Others have emphasized the importance of patient and family presence on collaborative teams, whereby patients become partners or stakeholders in care versus mere consumers (Doherty & Mendenhall, 2006; Mendenhall & Doherty, 2003).

Future intervention programs that are patient-centered, targeting the multiple needs of patients, are also essential. In 2004, Lin et al. suggested evaluating the integration of depression screening into diabetes care programs to improve patient outcomes. The impact of collaborative teams or comprehensive intervention protocols should be used to comprehend changes in underserved participants' health. These multidisciplinary teams must understand the unique needs, challenges, and strengths of underserved patients, which may promote better patient/family-provider relationships. In fact, in a focus group study of African American, American Indian, Hispanic/Latino, and Hmong individuals with type 2 diabetes, participants reported a need for more respectful, knowledgeable providers that are culturally responsive to themselves and their families (Devlin et al., 2006). By enacting programs and research valuing culture and biopsychosocial health, the needs of underserved patients would have a greater likelihood of being validated and addressed.

There are numerous examples of collaborative programs or interventions. For instance, one group of researchers has developed the Racial and Ethnic Approached to Community Health (REACH) in Detroit to improve diabetes outcomes for African American and Latino adults (Feathers et al., 2005). This team used five two-hour community based meetings to discuss stress reduction, depression, physical activity, nutrition, and maintenance of health behaviors using a culturally tailored curriculum. While this intervention showed statistically significant improvements in HbA1c and dietary or physical activity knowledge, the project did not include any psychosocial or spirituality variables in pre or posttest assessments. Though the intervention had some focus on depression and stress management, these frontiers were neglected in measurement. It may be important for future intervention programs to incorporate these psychosocial components and determine the biomedical gains from long-term depression management (Lustman et al., 2000). Ideally, these programs would not isolate psychological co-morbidities, such as depression, but incorporate all patient and family needs into assessment and treatment.

While a variety of professionals may be necessary in caring for the underserved, commonalities exist in their required competencies. One commonality is an appreciation for patient-centered, equitable care (IOM, 2001). Recent researchers have called for culturally sensitive care (Bernal & Saez-Santiago, 2006; Fisher, 2005). Since families from various ethnic groups differ in their patterns of expressing key processes in health-related family and disease management, they should be treated with a high level of cultural consciousness (Fisher, 2005). For instance, Caballero and Tenzer (2007) suggested that health care providers must understand the varying levels of acculturation and frameworks of health among Latino patients and families to enhance culturally competent care. Special considerations may need to be integrated to improve effectiveness of culturally-sensitive, comprehensive interventions. For example, intensive outreach, childcare, and transportation were suggested by researchers working with lower-income minority women with depression (Miranda et al., 2003). By raising awareness of cultural distinctiveness and providers' biases, the path toward equitable treatment in daily practice and intervention studies may be less cumbersome.

Conclusion

As the presence of diabetes continues to grow, especially among underserved groups, providers and researchers should be conscious of the psychosocial, spiritual, and quality factors that influence disease management. In grasping the unique needs of the underserved, researchers and clinicians would benefit from understanding commonalities and differences according to ethnic group, age, sex, among other constructs. By studying the interplay of the biopsychosocial and spiritual dimensions and their similarities or differences for various groups, researchers can initiate appropriate programs that capture the many influences on diabetes health.

Ultimately, looking toward the future, clinical and research implications should be pursued using an inclusive, patient-centered lens. With the current state of diabetes in our country, developing a comprehensive representation of underserved individuals with uncontrolled type 2 diabetes is not only important, but essential. By doing so, researchers and clinicians might build upon the current knowledge to combat the strain of diabetes in our country.

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Chapter Five: Proposal Method

Design

This study will use an existing data set to explore the comprehensive experiences of underserved, rural patients with type 2 diabetes. Funding for the project was obtained through the North Carolina Health and Wellness Trust Fund by investigators at Greene County Health Care, Incorporated (GCHC). The Institutional Review Board (IRB) approval for this study was obtained from the East Carolina University and Medical Center IRB prior to data collection (Appendix A). The principle investigator was a member of the initial investigation team. This investigator assisted with protocol development, execution of procedures, and the delivery of clinical therapeutic services. Quantitative data from a battery of questionnaires administered during each participant's initial visit will be used to explore four research questions:

1) Does depression have a relationship with HbA1c or BMI?
2) Are psychological variables predictive of lower satisfaction with life?
3) Is social support or spirituality related to satisfaction with life or do they moderate the relationship of psychological variables to satisfaction with life?
4) Are there differences in the biopsychosocial and spiritual experiences according to demographics?

Variables will consist of: HbA1c and BMI as included in the electronic medical record (EMR); total depression scores as measured by the Patient Health Questionnaire (Kroenke, Spitzer, & Williams, 2001); global severity indices, somatization subscale scores, depression subscale scores, and anxiety subscale scores as measured by the Brief Symptom Inventory (Derogatis, 2001); total perceived social support scores, perceived significant other support subscale scores, perceived family support subscale scores, and perceived friend support subscale scores as measured by the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988); total daily spiritual experiences scores as measured by the Daily Spiritual Experience Scale (Underwood & Teresi, 2002); total satisfaction with life scores as measured by the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985); and total perceived autonomy in care scores as measured by the Health Care Climate Questionnaire (Williams, Grow, Freedman, Ryan, & Deci, 1996). Demographic variables used include: age, sex (male or female), ethnicity (African American, Caucasian, Hispanic, American Indian), marital status (single, widow, separated, divorced, married), and income ($0-$10,000, $10-$20,000, etc.). Dependent upon the research question being addressed, both between group (demographic comparisons in biopsychosocial-spiritual health) and within subjects designs (exploring interrelatedness of biopsychosocial-spiritual dimensions) will be utilized.

Setting

The study took place at the Snow Hill and Bernstein Medical Centers housed under the GCHC system. GCHC is a large community health center system providing a medical home to approximately 30,000 patients annually. Operating as a Federally Qualified Health Center (FQHC), GCHC provides affordable services using a sliding fee scale based on patients’ family income. Clinics also bill insurance for patients with these resources. Medical clinics are located in Snow Hill, Greenville, and Walstonburg, North Carolina. Health care providers in these clinics offer services to a majority of rural eastern North Carolinians and even extend outreach services to the migrant farm worker camps in both Greene and Pitt Counties. Services offered include medical, dental, pharmacy, psychological, care management, nutrition, and outreach efforts. According to Mr. Smith, CEO of GCHC, nearly 70% of primary care visits are for patients with one or more chronic conditions and 80% have no health insurance (personal communication, December 1, 2008). Additionally, approximately half of the patients are migrant or seasonal farm workers, and nearly two-thirds speak Spanish as their primary language. Thus, our sample will include a majority of Latino, Mexican American, African American, lower education, and/or lower socioeconomic groups.

Participants

Participants were recruited for enrollment if they met the following criteria: 1) Adults ages 18 and older, 2) HbA1c of ≥ 7.0 or newly diagnosed, and 3) establish patient of GCHC. Exclusion criteria were: 1) Individuals who are cognitively impaired and/or who have psychotic symptoms and/or who have a terminal illness, and 2) individuals receiving diabetes health education and/or mental health services elsewhere.

Instruments

Demographics. An intake form was developed by the project staff to gather data from each project participant. The demographics collected for this study are a subset of the questions included on that form. The demographics that were collected for this study included: highest level of education, yearly household income, sex, and ethnicity.

Participants' birthdays or age and marital status were retrieved, upon consent, from their medical chart and confirmed at their initial visit.

Biomedical Markers. Biomedical markers of disease management were collected from each participant and entered into or were obtained from his or her electronic medical record (EMR). Participants' height and weight were obtained to compute their updated BMI. BMI was calculated as body weight divided by the square of height to identify current weight classification. All participants were asked to remove any coats or bags for this process to ensure consistency. Additionally, the most recent HbA1c was acquired from the laboratory results portion of their EMR.

Patient Health Questionnaire (PHQ-8). The PHQ is a self-report instrument used to measure the presence and severity of depressive symptomatology (Kroenke et al., 2001). The PHQ is a version of the Primary Care Evaluation of Mental Disorders (PRIME-MD) diagnostic instrument (Spitzer et al., 1994) used to score the nine DSM-IV criteria for depression, thus titled the PHQ-9. Participants were asked to rate symptoms over the past two weeks on a scale from zero to three with zero representing "not at all," one representing "several days," two representing "more than half of the days," and three representing "nearly every day" (Kroenke et al., 2001).

For the purposes of this study, the PHQ-8 was used since another instrument used in this study, the Brief Symptom Inventory (BSI; Derogatis, 2001), also assessed for suicidal ideation. The PHQ-8 includes all questions from the PHQ-9 except the item used to assess for thoughts of self harm (Kroenke & Spitzer, 2002). The removal of this item is acceptable when depression is being assessed as a secondary condition to another medical condition, such as diabetes in the present study (Kroenke & Spitzer, 2002). When the PHQ-8 and PHQ-9 were compared for sensitivity, specificity, and positive predictive value, the instruments operated similarly (Kroenke & Spitzer, 2002).

Data on reliability and validity are mostly represented for the PHQ-9. Inquiry into the psychometrics of the PHQ-9 has shown a Cronbach's alpha coefficient of .86 to .89, excellent test-retest reliability, and a strong correlation (0.84) between PHQ-9 scores and mental health professional validation interviews (Kroenke et al., 2001). When assessing criterion validity, sensitivity scores ranged from 68% to 95% and specificity scores ranged from 84% to 95% (Kroenke et al., 2001). The instrument has been used with a number of underserved groups and ethnic minorities. For instance, the PHQ-9 was utilized in a study of 5,427 participants (African-American, Latino, and non-Hispanic White), showing no differences among the three racial or ethnic groups (Huang, Chung, Kroenke, & Spitzer, 2006). Internal consistency reliability of the PHQ-9 in this study ranged from .79 to .86. Additionally, the Spanish version was employed by a group of researchers in a sample of lower income majority and minority women (Ell, Vourlekis, Nissly, Padgett, Pineda, & Sarbia, et al., 2002). These researchers also used a shortened version of the Brief Symptom Inventory (Derogatis & Melisaratos, 1983) to compliment the PHQ.

Brief Symptom Inventory (BSI-18). The BSI is an 18 item instrument used to measure overall psychological distress through a global severity index (Derogatis, 2001). The instrument also offers three subscales, including scales of depression, anxiety, and somatization. The BSI-18 is a brief version of the larger BSI (Derogatis & Melisaratos, 1983), originally developed from The Symptom Checklist (SCL-90-R, Derogatis, 1994). Participants were asked to rate their level of distress over the last seven days on 18 items using a Likert scale from zero to four, where zero represents "not at all," one representing "a little bit," two represents "moderately," three represents "quite a bit," and four represents "extremely" (Derogatis, 2001). The resulting scores provide the global indices and three subscales.

Psychometric exploration for the BSI-18 revealed a Cronbach's alpha of .89 (Derogatis, 2001). The internal consistency was replicated incorporating Spanish speaking participants showing a Cronbach's alpha ranging from .74 to .89 (Adams, Boscarino, & Galea, 2006). Other researchers have incorporated minority and/or underserved groups to expand the focus of the BSI-18. For instance, the instrument's depression and anxiety subscales have been used with a sample of 536 low-income Hispanic and African-American breast cancer patients (Ell, Padgett, Vourkelis, Nissly, Pineda, Sarabia, et al., 2002). A later study of 1,115 economically disadvantaged Latina mothers by Prelow, Weaver, Swenson, and Bowman (2005) highlighted the BSI's strong correlations with theoretically relevant constructs and high internal consistency.

Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS consists of 12 items generating a total level of perceived social support score and three subscale scores, including perceived support from a significant other, family, and friends (Zimet et al., 1988). The MSPSS uses a Likert scale ranging from one representing "very strongly disagree, four representing "neutral," and seven representing "very strongly agree". The development of this measure occurred with 275 college undergraduates at

Duke University (Zimet et al., 1988). Using this sample, researchers found high Cronbach's coefficient alphas for each subscale, ranging from .85 to .91.

While the initial exploration of the measure occurred only with undergraduates, high internal consistency was replicated in numerous studies using various samples, including psychiatric outpatients, diverse students at an urban college, older adults, and adolescent inpatient psychiatric patients (Canty-Mitchell & Zimet, 2000; Cecil, Stanley, Carrion, & Swann, 1995; Clara, Cox, Enns, Murray, & Torgrude, 2003; Dahlem, Zimet, & Walker, 1991; Kazarian & McCabe, 1991; Stanley, Beck, & Zebb, 1998; Zimet, Powell, Farley, Werkman, & Berkoff, 1990). Specifically pertaining to minority or underserved cohorts, the MSPSS has been utilized with Mexican Americans (Edwards, 2004; Edwards & Lopez, 2006; Landeta & Calvete, 2002) and African Americans (Canty-Mitchell & Zimet, 2000). These researchers' results revealed high internal reliability, ranging from .89 to .93 for total and subscale scores (Canty-Mitchell & Zimet, 2000).

Daily Spiritual Experience Scale (DSES). The DSES is a 16 item scale used to "measure experience rather than particular beliefs or behaviors; therefore, items are intended to transcend the boundaries of any particular religion" (Underwood & Teresi, 2002, p. 23). The first 15 items use a Likert scale ranging from five representing "many times a day," four representing "every day," three representing "most days," two representing "some days," one representing "once in a while," and zero representing "never." Participants were asked to consider how often they directly had particular spiritual experiences. The final item asked participants how close they felt to God with possible responses ranging from “not close at all,” “somewhat close,” “very close,” to “as close as possible.”

Underwood and Teresi (2002) attempted to establish content validity in the developmental stages of the instrument through in-depth interviews, focus groups, reviews of current scales, and revisions based on a variety of spiritual orientations at the World Health Organization’s Working Group on Spiritual Aspects of Quality of Life. In their 2002 study, the DSES showed excellent internal consistency of .94 and .95. The measure has also been used with minorities, specifically African Americans, showing a high internal consistency of .86 in one study (Loustalot, Wyatt, Boss, May, & McDyess, 2006).

Satisfaction with Life Scale **(SWLS).** The SWLS is a short, five item instrument used to measure life satisfaction (Diener et al., 1985). Questions pertain to global life satisfaction rather than specific constructs. Participants completed the items on a likert scale of disagreement and agreement, including a range from one representing “strong disagreement,” four representing “neither agreement nor disagreement,” and seven representing “strong agreement.” Likert scale scores represent “strong agreement or disagreement” (seven and one respectively), “agreement or disagreement” (six and two respectively), “slight agreement or disagreement” (five and three respectively), and “neither agree nor disagree” (four). Scores result in a total sum of dissatisfaction or satisfaction.

Diener et al. (1985) originally studied the instrument at the University of Illinois within an introductory psychology course. From this initial investigation, Cronbach's alpha coefficient was .87. A two month test-retest was high, showed a correlation coefficient of .82 and a coefficient alpha of .87. Pavot and Diener (1993) later highlighted the good convergent validity with other scales and discriminant validity from emotional well-being measures. These researchers further stated that “the SWLS is recommended as a complement to scales that focus on psychopathology or emotional well-being” (p. 164). This may be of particular interest given the present study’s aims. The SWLS has been used with Hispanic groups and shown good psychometric properties using both exploratory and confirmatory factorial analyses (Atienza, Balaguer, & García-Merita, 2003).

Health Care Climate Questionnaire **(HCCQ).** The HCCQ consists of six items used to assess patients’ perceptions of their degree of autonomy offered by their health care provider or health care team (Williams et al., 1996). The HCCQ is a Likert scale ranging from one representing “very strongly disagree, four representing “neutral,” and seven representing “very strongly agree” similar to the MSPSS and DSES. While the original measure was fifteen items, the present study utilized the six item version. A factor analysis of data from 638 individuals led to the selection of these six items (Williams, McGregor, Zeldman, Freedman & Deci, 2004). For this version, the Cronbach’s alpha was .86. Other psychometric data are limited for the shorter version of the HCCQ; though, the above mentioned research may be particularly relevant for this study since the HCCQ was used to study weight management and glycemic control (Williams et al., 1996; Williams et al., 2004). No known Spanish version exists; thus, translation was completed by a therapist and confirmed by a second community member who speaks fluent Spanish.

Procedure

Health care providers (physicians, nurse practitioners, and physician assistants) at GCHC referred patients to a collaborative program targeting underserved patients with type 2 diabetes. “Collaborative” is used to describe the program since health care professionals from multiple disciplines (e.g., medical family therapy, dietetics, medicine, and diabetes education) practiced concurrently, communicated frequently, and influenced individual and shared treatment plans. After referral to the collaborative program, participants were scheduled for an initial session with the therapeutic team (diabetes educator and medical family therapist) and possibly the dietician. The dietician was included in sessions in two cases: 1) when the health care provider had made a specific referral for these services and 2) when patients or families specifically requested information about nutrition or dietetics. Participants were asked to complete an Informed Consent document (Appendix A) detailing the purpose of the program, confidentiality standards, and information related to how research would be used. During this initial session, weight, height, and HbA1c were recorded as biomedical markers of disease management. While height and weight were recorded at this first visit, HbA1c was derived from each patient’s electronic medical record (EMR). Height and weight values were used to compute BMI. Patients then completed a number of demographic questions pertaining to age, sex, ethnicity, education, and marital status. Patients who opted not to participate in the research were still permitted to receive medical and mental health services from the collaborative program.

Subsequent to completion of the Informed Consent document and demographic questions, participants completed a number of psychosocial and spiritual questionnaires. Research packets took approximately 30-45 minutes to complete; however, this time period was shorter or longer depending upon participants' understanding of content. Spanish materials were available for participants who did not speak English. All instruments were read by the primary researcher or co-researchers to participants, ensuring comprehension of content. Content of the questionnaires assessed depression, anxiety, somatization, overall psychological distress, perceived social support, spirituality, satisfaction with life, and autonomous level of support from health care provider(s). All questionnaires were then scored by the research assistant and data was entered into a password protected computer within a SPSS database. All identifying participant information was removed and hard copies of questionnaires were stored in a locked filing cabinet.

Analysis

Data from instruments paired with demographic and biomedical markers of disease management will be used for analysis. Analysis in the present study will include exploration of the relationships between depression and other psychological distress scores with biomedical markers of health, including A1C and BMI, for the total population. These relationships will be investigated using Pearson product-moment correlation coefficients after preliminary analyses, which will include examination of the assumptions of normality, linearity, and homoscedasticity. Researchers will then address how well depression, psychological distress, social support, and spirituality predict life satisfaction using regression analysis. Prior to this analysis, outliers, normality, linearity, homoscedasticity, and independence of residuals will be observed using normal probability plots and scatterplots. Also, correlations will be performed between independent and dependent variable to check initial relationships prior to the regression for the full sample. Then, separate multiple regressions will be used for demographic subgroups. Within these split groups, researchers will explore which of the independent variables is the best predictor of life satisfaction. Lastly, researchers will examine the role of social support and spirituality in moderating the relationship between depression and psychological distress to satisfaction with life for the entire sample followed by analyses of demographic differences or similarities.

Reporting of Results

Results from the present investigation will be reported as a publishable manuscript, which will be submitted to the *Journal of Health Care for the Poor and Underserved* or *Diabetes Care*. Analyses and findings will flow from the general purpose of the project to explore the interplay of biological, psychological, social, and spiritual variables for underserved patients, thereby developing a more detailed understanding of the comprehensive experiences of those among health disparate groups. Conclusions will inform the conceptualization and treatment of underserved patients, in so doing reducing erroneous generalizations from past data of nonunderserved groups that may be less applicable to the multidimensional needs of the underserved.

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