ADULT ATTACHMENT THEORY AND DIABETES MELLITUS: AN EXAMINATION OF HEALTHCARE UTILIZATION AND BIOPSYCHOSOCIAL HEALTH

by

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Diabetes mellitus (DM) impacts hundreds of millions of individuals and their families around the globe. To explore the relational aspects of care and healthcare utilization two research articles were written: (a) a systematic literature review synthesized published research articles on diabetes and adult attachment theory; and (b) a descriptive cross-sectional study examined patient depictions consisting of relationship style, mental and physical well-being and healthcare utilization rates. The findings from the systematic literature review supported the need for additional prospective research focused upon diverse populations, and attachment style as the theoretical basis for understanding high utilizers of health care among patients with DM who experience barriers to quality health care. The cross-sectional study with a predominantly rural African American (AA) sample examined demographic, psychosocial (e.g., depression and social support), and behavioral data (e.g., primary care, specialty care, and behavioral health care utilization), by relationship style. There were 55 secure patients (37.2%); 21 fearful (14.2%); 13 preoccupied (8.8%); and 59 dismissing (39.9%). Compared to estimates of the general population as well as previous medical populations, the study sample consisted of slightly fewer secure patients, and slightly more dismissing ones. The findings showed most AAs were in the dismissing relationship category, which had the highest HbA1c values, yet reported the least amount of DM related distress. Preoccupied patients, who in previous studies tended to utilize more healthcare resources than other relationship types, actually utilized the least amount of outpatient primary care and specialty care, but more behavioral health. This study supports the need for: (a) more research on attachment styles among diverse populations with chronic disease; (b) further exploration of the relational aspects of care to assist in the development of behavioral and psychosocial patient profiles; and (c) expansion of studies about attachment styles in rural settings where socioeconomic and access to care issues may be barriers to quality health care. Recommendations based upon findings from both articles are presented for future research, clinical practice, policy awareness and development, and for the field of Medical Family Therapy.

ADULT ATTACHMENT THEORY AND DIABETES MELLITUS: AN EXAMINATION OF HEALTHCARE UTILIZATION AND BIOPSYCHOSOCIAL HEALTH

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DEDICATION

This dissertation is dedicated to my children, Tyler Seth and Bryce Hampton Dreyfus. You have been with me through this entire journey, beginning before you were born. I have continued through this doctoral program to try and be an example of perseverance, even though I have wanted to stop so many times. Having this dissertation based upon attachment theory, yet being away from you for class, internship, and writing has been by far the most difficult part of this process for me. I have always wanted a PhD, but I want you both to have a safe and secure foundation from which to grow more than anything. This is an important accomplishment for all of us.

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PREFACE

The organization of this dissertation includes five chapters dedicated to adult attachment theory and healthcare utilization among patients with diabetes mellitus (DM). The motivation for the research was to bridge my biomedically-based experience of chronic illness in a family medicine department to a more relational and systemic one as a developing Medical Family Therapy (MedFT) researcher, clinician, and supervisor. The primary theoretical foundations that influenced my growth and development as a medical family therapist, and ultimately this dissertation, include the biopsychosocial-spiritual (BPSS) model (Engel, 1977, 1980; Wright, Watson, & Bell, 1996), systems theory (Von Bertalanffy, 1968), and attachment theory (Bowlby, 1969, 1973, 1980).

MedFT was initially defined by pioneering authors McDaniel, Hepworth, and Doherty (1992) as the "biopsychosocial treatment of individuals and families who are dealing with medical problems" (p.2). Since then, it has provided a framework from which to operate when working with systems comprised of individuals, couples, family constellations, or even members of a healthcare team. In 2007, Linville, Hertlein, and Lyness set out to summarize and review the work that has taken place since McDaniel et al.'s (1992) primer text. They reviewed the efficacy and effectiveness research, which lead to their recommendation for a clearer definition of MedFT. This work was followed by a Delphi study done by Tyndall, Hodgson, Lamson, Knight, and White (2010) resulting in MedFT being defined as:

> An approach to healthcare sourced from a BPS-S perspective and marriage and family therapy, but also informed by systems theory. The practice of MedFT spans a variety of clinical settings with a strong focus on the relationships of the patient and the collaboration between and among the healthcare providers and the patient. MedFTs are endorsers of patient agency and facilitators of healthy workplace dynamics (p. 68-69).

As a student of MedFT, I observed in the literature that patterns of healthcare utilization and interfaces between inpatient and outpatient health systems for patients with DM appeared to have reached a level of crisis. Healthcare expenditures were exhausting and overwhelming the entire healthcare system from patient to provider and beyond (ADA, 2013; Meyers, Parasuraman, Bell, Graham, & Candrilli, 2014). These interface challenges between patients and their healthcare system peaked my interest as an emotionally-focused therapist. Emotionally-Focused Therapy (EFT) (Johnson & Greenberg, 1985) is a psychotherapy model that applies attachment theory to working with clients experiencing relationship struggles. It is based on the foundation of attachment theory which has been put forth as a method for clinicians in health care settings to better understand how to work with patients and their care team (e.g., family, friends, and providers) by attending to relational patterns and emotions that facilitate or interfere with relationship building and trust (Hooper, Tomek, & Newman, 2012; Morris et al., 2009).

My direct care experiences, and interest in how the patient and healthcare system cope with relational stressors and BPSS factors, led me to systematically review the literature (Chapter Two) to better understand the relationship among barriers patients with DM encounter when attempting to manage their disease, healthcare utilization and attachment styles. What I learned from this review was that navigating through a complex, and often times fragmented healthcare system, is a challenging or overwhelming process for patients who lack a secure attachment to a healthcare provider and/or care coordinator. Systemic issues can amplify biopsychosocial (BPS) barriers such as physical comorbidities (e.g., hypertension, heart disease) leading to disabilities (Kalyani, Brancati, Saudek, & Selvin, 2010) or complications (e.g., retinopathy, end stage renal disease [ESRD]) (Centers for Disease Control and Prevention [CDC], 2011; Forbes & Cooper, 2013); mental health diagnoses of depressive symptoms or major depressive disorder (Renn, Feliciano, & Segal, 2011; Rustad, Musselman, & Nemeroff, 2011); and a lack of social support (Nam, Chesla, Stotts, Kroon, & Janson, 2011) or access to quality care (Ali, Bullard, Imperatore, Barker, & Gregg, 2012). Although spirituality has been found to moderate some of the same systemic issues mentioned for chronic disease management specifically in rural areas, none of the included articles in the systematic review included it as a research component. However, in a study from Craig, Weinert, Walton, and Derwinski-robinson's (2006), researchers found their sample to be psychosocially and physically healthier than one would have expected and partially attributed this to the patients' spirituality. Outcomes of the systematic review fueled my desire as a researcher to better understand how patients' attachment styles influence their BPS health outcomes, and critical contemporary issues such as inpatient to outpatient transitions and overall healthcare utilization.

Adult attachment theory (Ainsworth, 1978; Bartholomew & Horowitz, 1991; Bowlby, 1973; Hazan & Shaver, 1994; Johnson, 2003; & Main, 2000) has been used in research among patients with DM; however, few studies exist that explore its application to rural and underserved populations with less education, fewer financial resources, and access to care challenges. Therefore, the purpose of the second article (Chapter Four) was to examine depression, distress, social support, empowerment, health perceptions, and medication adherence by relationship style in conjunction with outpatient and inpatient healthcare utilization rates. The intention of this study was to collect information that would help create BPS patient summaries where treatment plans and styles of patient interaction are more patient-centered rather than disease-focused. Spirituality was included in the introductory chapter, but was not included in the data collection for the second article (Chapter Four). The absence of spirituality data should not be interpreted as acknowledgement of a less important aspect of care, but was merely due to an existing data set and the specific interest in examining BPS aspects of care. For many patients, spirituality has been shown to be an important part of holistic care (Koenig, 2000; Lynch, Hernandez-Tejada, Strom, & Egede, 2012).

The resulting summaries may assist researchers, policy makers, and clinicians in more efficiently studying, advocating, and assessing for a variety of BPS factors that may serve as and/or influence patient well-being with DM. This dynamic and relationally-based approach would replace the existing method, where successful management of DM is oftentimes reduced to one or two biometric variables (e.g., hemoglobin A1c [HbA1c] values and body mass index [BMI]), with one where patient profiles including variables such as depression, anxiety, social/disease distress, spirituality, and attachment styles would become a standard part of the treatment planning and implementation process.

CHAPTER ONE: INTRODUCTION

Diabetes mellitus (DM) is a multifaceted chronic disease impacting hundreds of millions of patients globally (World Health Organization [WHO], 2013). In the United States, tens of millions have been diagnosed with DM, with incidence and prevalence increasing exponentially over the last three decades (Centers for Disease Control and Prevention [CDC], 2012). In 2012, the direct medical expenses for DM care across the United States was $306 billion, with approximately 75% of the costs related to inpatient, long-term care facility, hospice, and prescription care (American Diabetes Association [ADA], 2013); crossing the interfaces of inpatient and outpatient healthcare utilization. Specific to North Carolina, in 2008, the state Medicaid program spent $524 million on DM care alone (Buescher, Whitmire, & Pullen-Smith, 2009). Unfortunately, despite this tremendous financial investment, the CDC reported that in 2010 the number of DM cases in North Carolina was approaching almost 700,000, or 9.3% of the population (CDC, 2012). This was up from 8% in 2004 (CDC, 2014), and is comparable to national trends in the United States (Marrero et al., 2013).

Caring for chronic disease patients places demands not only on the financial part of the healthcare system, but on the clinical and operational components as well (Peek, 2008). Although published evidence-based guidelines exist for the management of DM, challenges persist and standards of care are often not met (Kirk et al., 2011). One model, the Chronic Care Model (CCM) (Wagner, 1998; Wagner, Davis, & Schaefer, 1997), was developed to try and improve the quality of care to patients with DM by initiating more of a systemic approach to care at the community, organization, practice, and patient levels. The CCM incorporates biomedical, psychosocial, and relational components of care between providers and their chronically ill patients (Eppling-Jordan, Pruitt, Bengoa, & Wagner, 2004; Wagner, 1998), and its objectives are to have healthier patients, more satisfied providers, and cost savings. According to Epping-

Jordan et al. (2004), “system changes support the development of informed activated patients and prepared proactive healthcare teams whose interactions become more productive and satisfying around chronic illness” (p. 300). Although the CCM is only one approach, it holistically reinforces the idea that critical components of the efficacy of DM management, and the success of systemically grounded interventions lie within the relationships between the patient, provider, and larger support system (Nam et al., 2011). In other words, multiple layers and the infinite exchanges between them, account for the necessity to view the challenges of chronic disease management and interventions designed to improve overall health outcomes from a patient-centered lens.

In addition to research done by developers of the CCM (Eppling-Jordan et al., 2004; Wagner et al. 1997; Wagner et al., 2001), it has been well documented that psychosocial and biomedical aspects of care influence one another with high rates of co-occurring mood (Ali, Stone, Peters, Davies, & Khunit, 2006; Anderson, Freedland, Clouse, & Lustman, 2001; Nichols & Brown, 2003) and anxiety disorders (Fisher et al., 2008; Huang, Chiu, Lee, & Wang, 2011), resulting in medical complications from poor glycemic control (Lustman et al., 2000) and more utilization of healthcare resources (Le et al., 2011). Beginning in the United States in 1999, the Psychosocial Therapies Working Group has presented annually to the National Institutes of Health Behavioral Science Research in Diabetes Conference on comorbid psychosocial stressors and treatment options. Although there had been some success with cognitive behavioral therapy (CBT) or pharmacotherapy, the group called for more longitudinal studies among lower socioeconomic (SES) ethnic minority patients with comorbid diagnoses. A cost effectiveness analysis of the therapies, in order to hone in on aspects of interventions most appropriate for populations, was also included in the recommendations (Delamater et al., 2001).

More than a decade later, a systematic review and a meta-analysis were conducted to examine psychosocial interventions among patients with type I and type II DM designed to improve both physical and emotional health (Harkness et al., 2010). The researchers recognized the inefficiency and lack of care coordination in the unconnected delivery of biomedical and psychological interventions. Harkness et al. (2010) found few researchers have integrated biopsychosocial (BPS) (Engel, 1977, 1980) interventions into their practice. They attributed this gap in the literature to the challenges patients may face initiating medical and behavioral change, as well as the lack of provider expertise delivering BPS care.

While this gap between patients, providers, and the healthcare system represents a serious threat to advancements in DM care, significant contributions have been made with the application of attachment theory (Ciechanowski et al., 2004; Ciechanowski, Katon & Russo, 2005; Ciechanowski, Russo, Katon, Von Korff, et al., 2006). The literature on DM and attachment theory builds on previous research that has supported the concept of better understanding parent-child (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969, 1973, 1980), as well as close or personal adult relationships (Hazan & Shaver, 1994). Prior researchers documented linkages between health related behaviors and adult attachment styles, particularly concerning less healthcare utilization among subjects with an avoidant attachment style; more symptoms reported by anxiously/ambivalently attached individuals (Feeney & Ryan, 1994); and a dependence or emotional reliance on providers among less secure patients (Maunder & Hunter, 2001). The adult attachment model developed by Bartholomew (1990) resulted in four styles (i.e., secure, preoccupied, dismissing, and fearful) (Bartholomew & Horowitz, 1991) that have been used to study healthcare utilization in the outpatient primary care setting among patients with DM (Ciechanowski, Russo, Katon, Simon, et al., 2006; Ciechanowski, Walker, Katon, & Russo, 2002).

As the United States embarks on healthcare reform, hospital readmission rates and measurable health outcomes have become quintessential performance measures of quality health care, and are being used to establish reimbursement rates (Farmer, Black, & Bonow, 2013; McCarthy, Johnson, & Audet, 2013; Williams, 2013). High inpatient and outpatient healthcare utilization in conjunction with hospital readmission rates, have lead the Centers for Medicare and Medicaid Services (CMS) to closely scrutinize readmission rates for chronic diseases (Bloink & Adler, 2013). The reason utilization rates are important to study among individuals with DM according to Zhang et al. (2010), is that patients with DM interact with and utilize more outpatient and inpatient healthcare services compared with non-DM patients. Without effective care coordination and clearly defined transition processes from inpatient to outpatient care (Eidus, Pace, & Staton, 2012; Institute of Medicine [IOM], 2013), meeting patients' biomedical, psychological, and social needs is difficult in a financially strained fragmented healthcare system.

To further understand the BPS and systemic issues central to transforming DM care, the purpose of this first chapter is to: (a) articulate the biopsychosocial-spiritual (BPSS) framework guiding the proposed dissertation; (b) describe the application of adult attachment theory to understanding relationship styles, DM, and healthcare utilization; (c) outline and defend the purpose and need for this study; and (d) provide an overview of each chapter included in this dissertation.

Theoretical Perspective: Biopsychosocial-Spiritual Model

Chronic diseases like DM require attention be paid to the systemic interactions and complex interwoven relationships within and between patients, providers, and the larger health care and social context. Necessary elements for optimal care include a collaborative interdisciplinary team of providers (Phelps et al., 2009; Wagner et al., 2001), social support (van Dam et al., 2005), along with an empowered patient (Wagner, Austin, & Von Korff, 1996). Theoretically, these care partnerships were brought together in George Engel's BPS model (1977, 1980), with spiritual aspects added later by Wright et al. (1996).

The catalyst of Engel's work is in what he termed a "crisis" in medicine that had resulted from a reductionist view of illness. He felt strongly that medicine, as a discipline, had a responsibility to recognize and integrate more than the biological processes of humans in a plan of care. He suggested this be accomplished by respecting that a patient's psychological and social systems, along with his or her health care system, has a shared influence on the patient's health outcomes (Engel, 1977; Katon, Lin, Von Korff, Ciechanowski, Ludman, Young, Rutter, et al., 2010; Peyrot, McMurry & Kruger, 1999). Therefore, the purpose of research grounded in the BPSS (Engel, 1977, 1980; Wright et al., 1996) model is to better understand the systemic nature of illness, and begin to extrapolate why the same diagnosis results in different experiences and outcomes among patients despite receiving the same or similar biomedical treatments. When reviewing the DM literature through the BPSS lens (Engel, 1977, 1980; Wright et al., 1996), one can see evidence emerging from the literature of a reciprocal relationship between biomedical, psychosocial, and spiritual health. The following studies punctuate the interrelationship between the BPSS domains.

Biomedical

Diabetes has the potential to lead to many serious physical complications including retinopathy, neuropathy, amputation of limbs, stroke, heart and kidney disease (Forbes & Cooper, 2013; Konen & Page, 2011; Mannucci, Monami, Lamanna, & Adalsteinsson, 2012; Nalysnyk, Hernandez-Medina, & Krishnarajah, 2010), and is often diagnosed with co-morbid conditions like congestive heart failure (CHF) (Bertoni et al., 2004), chronic obstructive pulmonary disease (COPD) (Barnes & Celli, 2009), and hypertension (HTN) (Lago, Singh, & Nesto, 2007). DM and comorbid conditions require strict medication adherence, which has been found to be positively correlated with less inpatient and emergent healthcare utilization; however, cost and access to care are often barriers to patients (Gibson et al., 2010). In contrast, SES, psychological factors (Ciechanowski, Katon, & Russo, 2000; Lin et al., 2004), and a lack of social or family support (Mayberry & Osborn, 2012) can negatively influence medication adherence resulting in disruptions or simply not taking medications as prescribed, leading to further disease progression (Cramer, 2004; DiMatteo, 2004; Nam et al., 2011).

Psychological

In the United States the lifetime prevalence for a major depressive episode is 16.6%, and 14.4% for major depressive disorder (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012); however, the rate can as much as double with the addition of a comorbid diagnosis of DM (Egede, 2006; Egede, Zheng, & Simpson, 2002). In a meta-analysis conducted by Anderson and colleagues (2001), research teams found up to 30% of patients with DM reported experiencing depressive symptoms, while other researchers reported 12-18% of patients met the criteria for major depression (Li, Ford, Strine, & Mokdad, 2008; Park, Katon, & Wolf, 2013). Rates of major depression tended to be higher among females and patients with type II DM on insulin therapy, compared to males and those not taking insulin (Li et al., 2008; Siddiqui, Khan, & Carline, 2013). The dual diagnosis of DM and depression has been linked to physical complications and increased mortality rates (Katon, Lin, Von Korff, Ciechanowski, Ludman, Young, Rutter, et al., 2010; Park et al., 2013), making the identification and management of psychological issues significant.

Recognizing, diagnosing, and treating depression in the primary care setting, where a majority of patients go for mental health care (Kessler, Merikangas, & Wang, 2007) has continued to be challenging (Baik, Crabtree, & Gonzales, 2013). Primary care practices and providers are highly influenced by operational limitations of time (Zhang, Van Leuven, & Neidlinger, 2012); varying levels of expertise and comfort in treating mental health issues (Machado & Tomlinson, 2011); and complex patients with comorbid chronic diseases, all of which are compounded by a provider shortage (Margolius & Bodenheimer, 2010). These issues are proliferated by higher utilization rates among patients with DM and depression (Egede et al., 2002; Le et al., 2011), and less medication adherence (Gonzalez et al., 2008) further evidencing how the BPSS domains mutually influence one another.

Distinct from depression, but often misinterpreted, diabetes related distress has been studied to better understand the aspects of care that patients struggle with, and is defined as "patient concerns about disease management, support, emotional burden, and access to care," (Fisher, Glasgow, Mullan, Skaff & Polonsky, 2008, p. 246). Polonsky et al. (2005) stated that among patients with DM, "diabetes-related conflict with loved ones may develop, and relationships with health care providers may become strained" (p. 626) the more distressed or overwhelmed patients feel in managing their disease. Models have emerged that acknowledge this fundamental dynamic. For example, in the CCM an empowered patient is a core component to successful treatment (Wagner et al., 1996; Wagner, 1998). The capacity to demonstrate an ability to set cognitive, emotional, and behavioral health goals; advocate for oneself; and work in conjunction with providers has been found to be beneficial to patients with chronic diseases (Wagner et al., 2001), furthering the need for BPSS care protocols that require treating the whole person by attending to the psychological components of care vital to improving health outcomes among DM patients.

Researchers conducting diabetes-related studies in community-based primary care outpatient settings have examined the relationship between patients with diabetes and comorbid psychosocial states including depression (Ali et al., 2006; Anderson et al., 2001; Caspersen, Thomas, Boseman, Beckles & Albright, 2012). They reported simultaneously treating diabetes and depression was more effective (Egede, 2006; Fenton & Stover, 2006; Katon, Lin, Von Korff, Ciechanowski, Ludman, Young, Peterson, et al., 2010; Rustad et al., 2011). This was found to be true when an emphasis was placed on patient-centered care coordination, system-wide quality enhancement, and collaborative care (Katon, Lin, Von Korff, Ciechanowski, Ludman, Young, Rutter, et al., 2010; Wagner et al., 2001). Based on improved physical and mental health outcomes; less healthcare utilization (Katon et al., 2012); higher patient satisfaction; and medication adherence (Katon, Lin, Von Korff, Ciechanowski, Ludman, Young, Rutter, et al., 2010); an integrated approach to DM and psychosocial stressors has been more effective than separate treatment approaches. The integrated approach provided consistent support for patients and highlighted the importance of a social network.

Social

Social support has long been thought to influence health from a physical and mental perspective. Managing stress or advocating for behavior change often occurs through a variety of coping mechanisms such as a sense of belonging; learning health related behaviors from others; or having a sense of empowerment from others in similar situations (Thoits, 2011). Early researchers often looked at a single stressful event such as work related stress; an unexpected or acute health condition; or the sudden loss of a loved one, and not its influence on long-term chronic disease conditions like DM (Cooper & Payne, 1978; Ganster & Victor, 1988). Stressful times have been shown to be accompanied by anxiety, depression, and distress which can be positively influenced through social support from those closest to us and even those with whom we work or attend church. A caveat to the positive health outcomes associated with social support lies in the capacity of individuals to accept love, support, and encouragement from others (Thoits, 2011).

A systemic review of social support and DM intervention studies found social support, provided by a variety of individuals including family members, spouses, and peers, delivered in person or via technology to be helpful with lifestyle modifications (van Dam et al., 2005). Another systematic review of the DM and family literature showed that family members are highly influential in helping a patient with diabetes make and maintain lifestyle changes (Rintala, Jaatinen, Paavilainen, & Astedt-Kurki, 2013). Van Dam et al. (2005) examined outcomes related to biomarkers (e.g., HbA1c, BMI, and lipids), levels of knowledge or understanding about diabetes, quality of life, and satisfaction with support and found: (a) peers were helpful in supporting lifestyle change; (b) patients improved through group medical visits; and (c) gender differences existed between spouses where females lost more weight with their spouses' participation in an educational program, but males lost more weight by completing the program alone. While social support largely has been studied using structural (e.g., marital status) and functional measures (e.g., quality) specific to one's primary relationships (Ganster & Victor, 1988), another important element of social support may include spirituality and/or belonging to a church (Polzer & Miles, 2005). For those who identify as being spiritual and/or religious, it may provide a source of connection, as well as existential motivation for disease management.

Spiritual

The influence of spirituality on health has been widely studied with the vast majority of findings supporting effective coping strategies and healthier lifestyles for those who are spiritual, compared to those patients reporting that religion or spirituality is not a part of their lives (Koenig, 2000; Lynch, Hernandez-Tejada, Strom, & Egede, 2012; Newlin, Melkus, Tappen, Chyun, & Koenig, 2008; Sridhar, 2013). Including spiritual aspects of care among patients with DM and comorbid depression has been found helpful in motivating patients to make behavioral changes and better manage their chronic disease (Lynch et al., 2012). For example, spirituality was found to have a positive impact on glycemic control among a sample of Black women (Newlin et al., 2008). A study that looked at spirituality and chronic disease, specifically in rural areas, found their sample to be psychosocially and physically healthier than one would have expected (Craig, Weinert, Walton, & Derwinski-robinson, 2006) taking into account the institutional barriers of access to care, lower SES status (Utz, 2008), and less healthy lifestyle choices (e.g., lack of physical activity) (O'Brien & Denham, 2008). Although results were not significant, most likely due to a small sample size, patients endorsed low levels of depression and unhealthy behaviors (e.g., smoking, drinking alcohol), as well as adequate social support, thought to have at least been modified by high levels of spirituality (Craig et al., 2006). However, the limitations of the body of work surrounding spirituality include a lack of evidence-based BPSS interventions and clarity about the role healthcare providers should or could play in including patients' spiritual beliefs as a part of the care process.

Attachment Theory and Diabetes as a Chronic Disease

Attachment theory is based on the premise that people develop close relationships with a few individuals to create a secure base from which to explore their environment with a sense of confidence or self-assurance (Ainsworth, 1978; Bartholomew & Horowitz, 1991; Bowlby, 1973; Hazan & Shaver, 1994; Johnson, 2003; Main, 2000). It is a non-pathologizing framework that supports the notion of depending upon others as a way to be more independent rather than enmeshed. From an evolutionary perspective, attachment theory includes the concept of individuals relying on fight or flight responses the more disengaged we become from our partner (Johnson & Whiffen, 1999).

While attachment theory was initially constructed to understand relationship styles and characteristics in young children, researchers have grown to appreciate that the tenants of attachment theory impact one’s social, cognitive, and emotional development, and experiences throughout life (Rholes & Simpson, 2001). Attachment is a cognitive representation based on the premise that people establish and maintain relationships in order to explore new experiences with a sense of security, as well as a framework that supports the notion of depending upon others as a way to be more interpersonally independent (Ainsworth, 1978; Bartholomew & Horowitz, 1991; Bowlby, 1973; Hazan & Shaver, 1994; Johnson, 2003; Main, 2000). Based on the quality of relationships, a variety of attachment styles have been described and found to be consistent over time, spanning life cycle transitions from childhood to adulthood (Main, 2000; Scharfe & Bartholomew, 1994).

In Bowlby’s (1969, 1973, 1980) original work, children were found to demonstrate three types of attachment styles: secure, insecure (specifically anxious or ambivalent), and avoidant. Later, Main and Solomon (1986) discovered a fourth insecure attachment type, disorganized.

Characteristically, secure adults are capable of asking for comfort in a time of need, and they possess the ability to trust others. They tend to be transparent about their distress, and capable of depending on others for support and love (Hooper et al., 2012). Other important attributes of securely attached individuals are that they are (a) able to engage in meta-cognition by accessing and reflecting on their secure relationships; (b) they are able to communicate with their partners and ask for support effectively; and (c) they can share themselves and self-disclose easily (Johnson, 2003; Johnson & Whiffen, 1999). Insecurely attached adults are more sensitive to loss and the possibility of abandonment, and may demonstrate emotional neediness. They attempt to avoid counting on anyone and may not trust others easily. Insecure styles are exacerbated when close relationships do not exist, or when individuals are emotionally unavailable (Bartholomew, 1990). Hazan and Shaver (1994) put it in terms of a question, “Can I trust my partner to be available and responsive to my needs (p. 13)?”

Focused on the use of adult attachment theory and chronic disease, researchers have most often used the four types classified by Bartholomew and Horowitz (1991): secure, preoccupied, dismissing, and fearful. Building on Bowlby’s work, the four types represent positive and negative internal models of self and others for adults who have formed relationships with individuals outside of their family. Secure and dismissing types have a positive model of self with a lower need for depending on others, while preoccupied and fearful have a more negative self-view and a higher need for others to validate their self-worth. Dismissing and fearful types have a negative view of others and are more likely to avoid close relationships, in contrast to secure and preoccupied who tend to have positive views of others and are more likely to enter into relationships (Bartholomew & Horowitz, 1991).

Having a negative view-of-self (i.e., preoccupied and fearful relationship styles) has been found to complicate self-management strategies for patients with chronic diseases in that patients felt as though they were less competent to manage their care, or simply were unable to access appropriate coping mechanisms. According to Ciechanowski, Sullivan, Jensen, Romano, and Summers (2003), preoccupied style chronic pain patients utilized the health care system more because of their positive views of others and their need for reassurance, while fearful types avoided health care in general (Ciechanowski et al., 2003). In several studies focused on health and health care, those who exhibited preoccupied and fearful attachment styles were found to have similarities in that both were more likely to report somatic symptoms compared to clear and objective physical ones (Ciechanowski et al., 2003; Feeney & Ryan, 1994; McGrady, Lynch, Nagel, & Zsembik, 1999). In a 2002 study by Ciechanowski et al., patients with a preoccupied attachment style were found to have the highest level of symptom reporting, and in turn the most primary care visits over the course of a year. Those with a fearful style had the least number of primary care visits, displaying avoidant behavior and not maintaining continuity with a provider. This type of behavior could be attributed to not wanting to establish or maintain a close relationship; however, this lack of continuity lead to fragmented care and increased utilization of emergent services in the emergency room or urgent care (Ciechanowski et al., 2003).

Researchers from the University of Washington Diabetes Care Center conducted a follow-up qualitative study with 27 patients diagnosed with DM (Ciechanowski & Katon, 2006). Their method included data previously collected via the Relationship Questionnaire (RQ) (Bartholomew & Horowitz, 1991), followed by two face-to-face interviews and a brief interview over the phone. Three overarching themes emerged from their study: (a) secure patients had a strong trust in their providers and often the health care system; (b) dismissing patients reported a heightened awareness of being controlled; and (c) fearful patients were consumed with worry about rejection or abandonment to the point that they remained with a provider to avoid having to establish a new relationship. Both dismissing and fearful types discussed the barriers present between themselves and providers; were more sensitive to navigation issues in the healthcare system; more aware of power differentials; and shared anecdotes of early relationship trauma that seemed to be with them in the present (Ciechanowski & Katon, 2006). Previously these two types have also been found to have less social support, more traumatic events early in life, and to have reported less satisfaction with providers and healthcare system (Ciechanowski, Katon, Russo, & Walker, 2001; Ciechanowski, Russo, Katon, Simon, et al., 2006). Secure patients mentioned some of these same issues but did not let them influence the patient-provider relationship (Ciechanowski & Katon, 2006).

Overall, DM is a chronic disease state with biological, psychological, social, and spiritual aspects of care. It is not only economically challenging to patients, their families, and our healthcare system; it is a disease process that demands ongoing medical regimen adherence. Both elements can be challenging, particularly among vulnerable populations facing barriers to care. Further research is needed to contribute to the relational gaps in the healthcare utilization literature.

Need for the Study

In spite of concerns about the growing cost of chronic diseases like DM and knowledge about evidence-based quality care markers, attachment theory, healthcare utilization, and known comorbidities; no known studies have been completed on what BPS (e.g., HbA1c, depression, social support, and distress) and relational factors (i.e., attachment style) are most influential on primary care, specialty, and behavioral healthcare utilization rates (an indicator of disease management (Maciejewski & Maynard, 2004) with a rural population. In 2003, DM was one of the Institute of Medicine's (IOM) twenty priority conditions, defined as those that "disable a large number of Americans for which a strong body of clinical evidence has established best-practice treatment methods" (Agency for Healthcare Research and Quality [AHRQ], 2004, Background section, para. 3). Even though attention was being directed to evidence-based guidelines for treatment of DM in the early 2000s, incidence and outcomes are not improving (Tricco et al., 2012). In fact the costs are greater to the patient and the healthcare economy (ADA, 2013). Researchers and interventionists have simply not uncovered the key to helping patients with DM manage their disease successfully. What works for one subset of the population is not working for all (Tricco et al., 2012).

Due to the epidemic proportion of diagnosed patients and the cost of care, a study investigating adult attachment and relational aspects of care is obligatory to advance exploration of healthcare utilization rates and BPSS health outcomes among patients with DM. In 2004, the AHRQ commissioned a study, which resulted in Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies (Shojania et al., 2004). This study found projects with more than one quality improvement strategy in the study of DM care (i.e., patient self-management, provider education, organizational structure, quality enhancements of care delivery, and the relationships between all these variables) were more effective in terms of glycemic control as measured by HbA1c and provider management of common co-morbid complications (i.e., retinopathy, neuropathy, and nephropathy) (Shojania et al., 2004). Reinvigorating Shojania and colleague's (2004) idea for a more systemic approach to studying quality improvement in DM care may be the answer to better meeting complex patient needs in a fragmented healthcare system.

The application of attachment theory to outpatient and inpatient chronic disease management has provided a framework for the examination of relationship styles, treatment outcomes, and healthcare utilization rates; yet it has not been done with the neediest populations: those attempting to survive in rural, underserved geographical locations with limited educational, financial, and transportation resources. Several of the studies that have been done were published from the same data set by various groups of the same authors from one institution in the northwest United States, whose participants were predominantly White, educated (defined as at least one year of college), and insured (Ciechanowski et al., 2010; Ciechanowski, Russo, Katon, Simon, et al., 2006; Ciechanowski et al., 2004; Ciechanowski et al., 2001; Ciechanowski, Russo, Katon, Von Korff, et al., 2006; Ciechanowski et al., 2002). Because rural populations do not often resemble this demographic composition (Smith, Humphreys, & Wilson, 2008), additional studies are needed with rural, ethnically diverse patient populations across the United States with varied educational levels and access to affordable health care.

In terms of attachment styles, some researchers were unable to report on all four styles (Ciechanowski, Russo, Katon, Von Korff, et al., 2006), or chose to combine styles (Ciechanowski et al., 2010) due to smaller numbers of patients in certain style categories; therefore, research is needed to focus more on the preoccupied type to better understand these patients' needs. Less frequently occurring attachment styles may make it difficult to have appropriate statistical power to analyze data and draw accurate conclusions. Additionally, not all studies on attachment styles and DM included data on the impact of social support, and none of them examined the impact of DM distress levels on patients' utilization patterns. Social support serves as a mediator to DM related distress (Baek, Tanenbaum, & Gonzalez, 2014); encourages medical adherence (Mayberry & Osborn, 2012); and provides a relational environment to learn from and depend upon others (Thoits, 2011). Based upon the difficulty some attachment styles have in establishing and maintaining personal relationships, and patient-provider relationships; it is critical to include social support and distress in order to suggest specific recommendations to providers working with rural underserved populations.

In sum, although healthcare utilization has been examined in accessible urban primary care settings with educated and financially stable patients with DM (Ciechanowski et al., 2002; Himelhoch, Weller, Wu, Anderson, & Cooper, 2004), additional research is needed focusing on ethnically and geographically diverse patients like those living in rural eastern North Carolina. Additionally, while emphasis has been placed on the importance of outpatient providers' awareness of their patients' attachment styles (Ciechanowski et al., 2004; Holwerda et al., 2013; Meredith, Ownsworth, & Strong, 2007), additional research is needed exploring the relationship that an individual's attachment style, diabetes related distress, and social support have on healthcare utilization. This is particularly critical among the rural populations who have more social and structural challenges increasing their personal risk factors and resulting in challenging environmental, occupational, and transportation conditions that impact their health outcomes.

Conclusion

In the following chapters the reader will find relevant information on DM, attachment theory, and healthcare utilization. Chapter Two is entitled "Diabetes and Attachment Theory: A Systematic Review of Adult Attachment Theory and Diabetes Mellitus." The research questions guiding the systematic review were: (a) "What internal and external factors influence healthcare utilization among patients with DM?" and (b) "What impact does attachment style have on healthcare utilization among patients diagnosed with DM?" A total of 46 articles met the inclusion criteria and were grouped into three themes: (a) Outpatient and Inpatient Healthcare

Utilization), (b) Internal and External Systemic Barriers to Care and Healthcare Utilization; and (c), Attachment Style and Healthcare System Interactions. Findings supported that patients with DM were higher utilizers of outpatient and inpatient care. This utilization was associated with higher healthcare costs. Researchers also reported that disparities existed among patients based on external factors (i.e., geographic location and insurance status), and internal factors (race and self-management behaviors [especially medication adherence]). In terms of attachment style among patients with DM, anxious styles used more health care, had poorer health outcomes, and struggled more with depression than the secure attachment style. The literature review reflected the need for outcome studies on the influence of patient and provider attachment styles on utilization rates in both the outpatient and inpatient healthcare settings. To date, much of the research has relied heavily on archival databases that may have limited the data or ability to obtain robust information. There has been a lack of psychosocial information collected to comprehensively understand utilization patterns, particularly in regard to social support or distress from managing and living with DM.

The third chapter is the Method section of the dissertation and details the quantitative data collection methodology employed to gather data from a sample of DM patients, as well as the statistical analyses used to interpret the data. The fourth chapter of the dissertation includes the second publishable manuscript with the study's results. The data collection for this study occurred in two phases. Phase one consisted of self-report responses from 258 consenting patients regarding their symptoms of depression, social support, patient empowerment, health perception, and medication adherence, along with demographic data. The second phase of the study involved administering two additional surveys to the phase one participant group to determine patients' attachment styles and what aspects of DM management cause each participant the most distress. A total of 148 patients of the original 258 participated in phase two. Outpatient and inpatient healthcare utilization rates were also gathered either by chart review or reports generated through the electronic health record (EHR).

The aim of the descriptive cross-sectional study (Chapter Four) was to create behavioral and psychosocial profiles to explore the impact of attachment style on primary care, specialty and behavioral health outpatient care, inpatient utilization, and secondarily HbA1c. The research question guiding this study was: What are the psychosocial (depression, distress, social support, health perceptions, patient empowerment) and behavioral (medication adherence, healthcare utilization) patient profiles among adult patients with DM living in a rural geographic location by attachment style? Previous DM and adult attachment research was conducted with a primarily Caucasian, educated, insured, urban sample (Ciechanowski et al. 2010; Ciechanowski & Katon, 2006; Ciechanowski et al., 2004; Ciechanowski, Katon, & Russo, 2005; Ciechanowski, Russo, Katon, Von Korff, et al., 2006). With a mostly African American (AA) sample it was hypothesized that the grouping of patients by attachment style would differ by patient demographics (i.e., gender, age, type of insurance, and marital status).

As a means to build upon prior attachment studies with diabetic patients (Ciechanowski et al., 2010; Ciechanowski, Russo, Katon, Simon et al., 2006; Ciechanowski et al., 2004; Ciechanowski, Katon, Russo, Walker, 2001; Ciechanowski, Russo, Katon, Von Korff, et al., 2006; Ciechanowski, Walker, Katon & Russo, 2002), and further describe psychosocial characteristics it was hypothesize that securely attached patients with DM would be more likely to report: (a) higher levels of social support and DM empowerment; and (b) greater mental health well-being (less depression and less distress, and better physical and mental health perceptions) to depict a psychosocial patient summary. In contrast, it was hypothesized that patients with insecure attachment styles (preoccupied, fearful, and dismissing) (Ciechanowski & Katon, 2006; Ciechanowski, Russo, Katon, Simon et al., 2006; Ciechanowski et al., 2001) would be more likely to report: (a) less social support and DM empowerment; and (b) lower mental health well-being (moderate to severe depression, more distress, and less healthy physical and mental health perceptions). To address the second and third hypotheses psychosocial (social support, empowerment, health perception), and mental well-being questionnaires (depression and distress) were analyzed by attachment style.

Lastly, the literature has shown patient barriers (i.e., depression) exist and hinder strict treatment adherence often resulting in more healthcare utilization among certain types of relationship styles (Ciechanowski, Russo, Katon, Simon, et al., 2006; Ciechanowski, Katon, & Russo, 2000; Ciechanowski et al., 2001; Egede, Zheng, & Simpson, 2002; Gibson et al., 2010; Hepke, Martus, & Share, 2004; Lin et al., 2004). To examine this issue it was hypothesized that among patients with certain combinations of attachment, psychosocial, and behavioral characteristics, total healthcare utilization rates and HbA1c values would be higher.

Most importantly this study provided information that was not yet known in regard to rural African American (AA) primary care patients. The sample of 148 patients was 71.6% AA, quite different from previous research published where the majority (78-86%) of patients were Caucasian. In many of the studies attachment styles were presented for Caucasian patients only (Ciechanowski et al., 2004; Ciechanowski et al., 2001; Ciechanowski et al., 2002). Ciechanowski et al. (2010) did share the attachment styles for non-white subjects, but the study had combined the four styles to two resulting in an interactive style (i.e., secure and preoccupied) and an independent style (i.e., dismissing and fearful), limiting the ability to fully examine the differences between each style.

Compared to previous studies (Bartholomew & Horowitz, 1994; Ciechanowski & Katon, 2006) one would expect to see approximately 55% of general population and 44% of medical populations in the secure category; 5-10% of the general population and 12-20% of a medical population in the fearful category; 8-15% of the preoccupied style in both the general and medical populations; and 25% of the general population and 36% of the medical population as dismissing. In the rural sample, patients were grouped into each of the four relationships styles: secure (N=55, 37.2%); fearful (N=21, 14.2%); preoccupied (N=13, 8.8%); and dismissing (N=59, 39.9%). Of the 59 dismissing style patients, 79.7% (N=47) were AA, compared to only 20.3% (N=12) who were not. Nine AA's (69.2%) were preoccupied; thirteen (61.9%) were fearful, and 37 (67.3%) were secure. To summarize, this rural PC sample of patients with DM in terms of gender and race, looks different than those in previous studies with predominantly Caucasian samples (Ciechanowski et al., 2005; Ciechanowski et al., 2001; Ciechanowski, Russo, Katon, Von Korff, et al., 2006), as it has fewer secure and more dismissing patients. Females reported their relationship style as secure most often and males as dismissing. The most AAs were found in the dismissing style, while the most non-AAs were in the secure group.

The fifth and final chapter of the dissertation is focused upon the implications from articles one and two (Chapters Two and Four). It is intended to portray an overall summary of this dissertation. The implications and recommendations are focused on those stakeholders involved in health care with a BPSS lens including: researchers, clinicians, policy makers, and medical family therapists.

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CHAPTER TWO: DIABETES AND ATTACHMENT THEORY: A SYSTEMATIC REVIEW OF ADULT ATTACHMENT THEORY AND DIABETES MELLITUS

The World Health Organization reported that as of March, 2013, 347 million people have been diagnosed with diabetes mellitus (DM). The prevalence of DM is increasing at a staggering rate worldwide, particularly in Asia, the Middle East, Africa, and developing countries around the world (Lam & LeRoith, 2012; Wild, Sicree, Roglic, King, & Green, 2004). In the United States, the latest statistics published in 2011 from the Centers for Disease Control and Prevention (CDC), reflected that DM has affected 25.8 million people, or 8.3% of the population (CDC, 2011). A 2010 study by Boyle, Thompson, Gregg, Barker and Williamson (2010), recently supported by the American Diabetes Association (ADA) (2013), suggested that as many as one in three adults living in the United States could have DM by the year 2050 based on more diagnoses and longer lifespans. National and international research teams like the CDC, ADA, and the International Diabetes Federation (IDF) have reported, based on the incidence of new diabetic cases, healthcare utilization and associated costs will rise because the prevalence could be as much as 552 million worldwide by 2030 (IDF, 2012; Lam & LeRoith, 2012).

Caring for patients with a chronic disease like DM is a complicated interaction of science, provider relationships, and patient choice (Marrero et al., 2013) that positions significant strain on our healthcare system and economy. Newly published statistics from the ADA (2013) estimated that the annual costs for caring for patients with DM are $245 billion ($176 in direct and $69 in indirect), or 2.3 times higher than individuals without DM. Meeting patients' biomedical, psychological, and social needs are difficult, particularly in a financially strained fragmented healthcare system lacking care coordination and clearly defined processes for transitioning care between inpatient and outpatient systems (Eidus, Pace, & Staton, 2012; IOM, 2013).

Patients with DM use more healthcare services overall (Zhang et al., 2010) and specifically, utilization of inpatient care has been found to be a predictor of hospital readmission (Chen, Ma, Chen, & Yermilov, 2012). High healthcare utilization and hospital readmission rates have lead the Centers for Medicare and Medicaid Services (CMS) to closely scrutinize readmission rates for chronic diseases (Bloink & Adler, 2013). They most recently approved new transitional care management (TCM) codes to allow professionals, such as physician assistants and nurse practitioners, to be compensated for fostering better patient/provider relationships and reducing barriers to disease management through phone contact and face-to-face appointments.

The identification of patient relationship characteristics for those accessing outpatient, emergent, or inpatient care more often may help to determine appropriate integrated care services (Remler et al., 2011), and help patients change health behaviors undermining their ability to successfully manage their disease on an outpatient basis. According to Hooper, Tomek, and Newman, “attachment theory may provide a blueprint for attachment-based practice in the context of medical settings” (2012, p. 24). The level of stability within child-caregiver attachment relationships has been found to influence adult patient-provider collaborations resulting in insecure patients looking for regular reassurance from their providers (Miller, 2008). Securely attached patients more easily trust providers, therefore often experience more satisfaction in their health care and patient-provider relationship. However, patients with insecure types of attachment interact differently. Some may avoid care and dismiss physical symptoms, while others over exaggerate symptoms to see providers more often and avoid the chance of rejection (Hooper et al., 2012). Focusing on the relationship styles of patients and providers may help to avoid labeling patients as non-compliant, non-adherent or just plain difficult, and provide a clearly coordinated transition of care (Mauksch & Safford, 2013).

Attachment theory is a cognitive representation based on the premise that people establish and maintain close relationships with a few individuals to create a secure base from which to explore their environment (Ainsworth, 1978; Bartholomew & Horowitz, 1991; Bowlby, 1973; Hazan & Shaver, 1994; Johnson, 2003; Main, 2000). It is a non-pathologizing framework that supports the notion of depending upon others as a way to be more independent rather than enmeshed. Attachment theory is based upon the early work of John Bowlby (1969, 1973, 1977, 1980) and Mary Ainsworth (1989) with children and their primary caregivers. However, from an evolutionary perspective, attachment theory includes the concept of individuals relying on fight or flight responses the more disengaged one might become from a partner. Flight behaviors are used to avoid responding to others when they share thoughts or emotions (Johnson & Whiffen, 1999), such as caregivers or healthcare providers. The four relationship styles often used in adult attachment theory research with DM patients include secure, dismissing, preoccupied, and fearful measured by the Relationship Questionnaire (RQ) (Bartholomew & Horowitz, 1991).

Much work has been done to explore and document approaches to managing and better caring for patients with DM with the use of attachment theory in outpatient settings (Ciechanowski & Katon, 2006; Ciechanowski, Russo, Katon, Simon, et al., 2006; Ciechanowski et al., 2004; Ciechanowski, Katon, Russo, & Walker, 2001;); however, there has been no known systematic review completed to synthesize and critique the relevant research literature in this area and understand the influence of attachment styles of patients with DM on healthcare utilization. The purpose of this article is to review the literature in this area and respond to two questions: (a) What internal and external factors influence healthcare utilization among patients with DM? and (b) What impact does attachment style have on healthcare utilization among patients diagnosed with DM?

Method

Cooper's (2010) method was used to guide this systematic review. Subsequent to identifying the research questions, the following main key word search terms were selected: diabetes, attachment theory, healthcare utilization, and readmissions. Additional search terms that could be synonymous with these four main search terms were also included to ensure that the search process captured as many articles that met the inclusion criteria as possible. The search terms used and the number of relevant articles are displayed in Table 1. The following databases were selected for this review: MEDLINE via PubMed, PsycInfo, and all Evidence-based databases including Cochrane DSR, ACP Journal Club, DARE, CCTR, CMR, HTA, and NHSEED, Health and Psychosocial Instruments 1985 to April 2013, and Ovid Healthstar 1966 to July 2013. Each of these databases was chosen based on their emphasis on medicine, healthcare systems, and psychosocial information within original research or review articles. No restrictions were placed on publication dates in order to capture as many articles as possible that met the inclusion criteria through August 2013.

Research articles that met the following inclusion criteria where admitted into the review: (a) focused on attachment, DM, and healthcare utilization, (b) conducted using quantitative and/or qualitative methods, (c) published in English and conducted in the United States, and (d) with adult participants, and published in peer reviewed journals (PRJ). To prevent possible confounding, articles were included if the research was conducted in the United States only as healthcare utilization may be influenced more by the structure of the healthcare system and economics than the DM disease process (Epping-Jordan, Pruitt, Bengoa, & Wagner, 2004;

Jonsson, 1998; Zimmet, Alberti, & Shaw, 2001). Articles were excluded if: (a) empirical research was not conducted or published in a PRJ, (b) DM was not the chronic disease studied, (c) research was conducted outside of the United States, and when (d) children (ages 17 and younger) were the study subjects.

The process of determining if an article met the inclusion criteria began with a careful review of the article's title and abstract. To help reduce the possibility of an exclusion or inclusion error, a second researcher was added to this review. The researchers labeled each article that resulted in the initial search process as: include, exclude, or possibly include. Articles coded as include or possibly include were then read in full to determine if the inclusion criteria were met. The reference lists of the articles that met the inclusion criteria were then reviewed and articles identified for possible inclusion were critiqued according to the inclusion criteria to determine if they should have been admitted into the final set. The initial search yielded 420 articles. Of those 44 met the inclusion criteria initially. The second search yielded an additional 151 articles for a total of 571. Only two of the additional articles met the inclusion criteria yielding a total of 46 articles that were found to fit the inclusion criteria for this systematic review (see Figure 1).

Results

The researchers organized the articles into three themes: (a) Outpatient and Inpatient Healthcare Utilization (n=41); (b) Internal and External Systemic Barriers to Care and Healthcare Utilization (n=26); and (c) Attachment Style and Healthcare System Interactions (n=7). Findings, key data points, and descriptive information from each article are summarized in Table 2. Of the 46 articles admitted into the review, 29 articles were categorized in more than one theme. Table 2 was organized to include a final column used to identify which of the three themes applied to each article. The large number of studies falling into more than one theme, including internal and external systemic barriers to care, and outpatient and inpatient healthcare utilization supports the complexity of healthcare utilization in that multiple dimensions interact and influence one another.

Inpatient and Outpatient Healthcare Utilization and Diabetes

Patients with a chronic disease such as DM frequently interact with healthcare providers both in the outpatient primary care (PC) or specialty setting, as well as inpatient hospital systems. Healthcare utilization coupled with cost has been widely studied to explore inpatient and outpatient usage and health outcomes, hospital lengths of stays, care patterns between different provider types, and interventions among patients with DM. A total of 41 articles met the inclusion criteria for the review within this theme. Many of the researchers in this theme either found patients with DM were often high utilizers of health care and in turn had higher healthcare expenses (Chin, Zhang, & Merrell, 2000; Ciechanowski, Russo, Katon, Simon, et al., 2006; Kim & Boye, 2009; Maciejewski & Maynard, 2004), or that patients received suboptimal care with low utilization rates (Fenton, Von Korff, Lin, Ciechanowski, & Young, 2006). Researchers reported as many as 303 admissions for every 1000 individuals with DM type II in the United States in 2005, compared to only 100 for every 1000 without DM. The average costs were $14,300 for those without DM, and $16,200 for type II patients totaling a staggering $795 billion with 20.9% of the admissions stemming from 7% of DM patients (Kim & Boye, 2009).

Inpatient Healthcare Utilization. Several researchers have looked at healthcare utilization of patients with DM specifically in terms of inpatient hospital stays and readmissions. One study, with a large sample (n=124,967) of patients 50 years of age and older, found over a quarter of patients were readmitted within three months with 87.2% of the readmissions unscheduled and 19% of them preventable (Kim, Ross, Melkus, Zhao, & Boockvar, 2010). High rates of readmissions have been linked with higher HbA1c values. Patients with HbA1c values above 10% had 2.25 times more inpatient admissions compared to those <7% (Menzin et al., 2010). Further impacting inpatient care and finances are co-morbid chronic diseases like coronary obstructive pulmonary disease (COPD) and congestive heart failure (CHF), which impact the complexity of DM management, utilization rates, and healthcare costs. Those with comorbid conditions had the highest readmit rates for both Europe and the United States, while those with COPD and asthma had longer hospital stays (Westert, Lagoe, Keslimaki, Leyland, & Murphy, 2002), and in turn reported higher healthcare costs. Earlier research with a Veterans Administration (VA) population had similar findings among patients with DM, COPD and CHF even with a structured inpatient and outpatient intervention, which emphasized education and a clear care transition with a follow-up visit scheduled prior to discharge delivered by nurses and physicians, (Weinberger, Oddone, & Henderson, 1996); however, because this study was conducted with hospitalized veterans generalizability is a limitation. Nearly all of the patients were male, two-thirds were White, and most were considered to be very physically sick with significant comorbidities.

In looking at hospital based healthcare utilization rates from a psychosocial perspective two research teams included participants with depression in their studies and both found depression was associated with higher inpatient or emergent healthcare utilization rates (Himelhoch, Weller, Wu, Anderson, & Cooper, 2004; Husaini et al., 2004). Older, White females on Medicare with DM and depression were twice as likely to utilize the ED or inpatient care (Himelhoch et al., 2004). A study, with African American (AA) patients ages 40 and older, found more primary care provider (PCP) visits among patients with depression; significantly less inpatient care among patients with only DM; and in patients with both DM and depression a rate of 2.75 times the number of ED visits and three times the number of inpatient days (Husaini et al., 2004). Himelhoch et al., (2004) assessed for depression using the International Classification of Disease-9th revision (ICD-9), which may be less reliable and vulnerable to documentation errors, whereas Husaini et al. (2004) used the PRIME-MD (Spitzer et al., 1994) gathering data directly from patients.

Outpatient Healthcare Utilization. In examining utilization, two of the studies reviewed (Chin, Zhang, & Merrell, 2000; Huang et al., 2004) compared rates by care setting (e.g., DM center compared to a general medicine clinic) and provider type (e.g., specialist compared to PC) finding few differences in outpatient or inpatient utilization or costs. More patients were seen by PCP (n=456), however patients of the DM center (n=145) were sicker in terms of blood glucose control and complications, and required more rigorous outpatient care so findings may be interpreted to mean that the care at the DM center was effective (Huang et al., 2004). In the other study comparing endocrinology with PCPs (e.g., family and internal medicine), only 4% of patients saw an endocrinologist. The patients were younger and more educated, but had more complications so it was not surprising they had more admissions and emergency department (ED) visits compared to patients of PCPs resulting in higher costs. There were no differences in readmission and follow-up rates after hospital discharge among the provider types, but Chin et al. (2000) did find Medicare patients of PCPs were more satisfied when it came to healthcare system matters (e.g., access, patient costs, provider knowledge) and higher follow-up rates (although not statistically significant). The assumption could be made that Medicare patients were established with their providers, but this aspect of care was not discussed in the study. Unlike the first study (Huang et al., 2004), the second study by Chin et al. (2000) did include health perception and satisfaction measures from the patients but found no significant differences in utilization rates, but one could speculate that satisfied patients were more likely to follow-up with their PCP.

Inpatient and Outpatient Interventions and Impact on Healthcare Utilization. Based on multiple studies, it appears that inpatient and outpatient interventions designed to not only reduce utilization but also to provide better care, have had mixed results. Koproski, Pretto, and Poretsky (1997) studied the feasibility of an inpatient intervention delivered by a team, which was not operationally defined, but included an endocrinologist to write orders along with nutrition or social work consultations when appropriate. In the randomized controlled trial (RCT) done with 179 DM patients, investigators examined whether an inpatient DM team focused on insulin and blood glucose monitoring education helped lower high utilization and costs, as opposed to standard care provided by physicians, nurses and ancillary care providers as needed. Findings showed that among those in the intervention group, 75% of patients had appropriate glucose rates during the first month of the program compared to only 46% in the control group, but as time went on between group differences diminished. However, only 15% of intervention patients were readmitted within 3 months compared to 32% of the control group (p<0.01) so the inpatient team intervention was especially effective as the intervention group had significantly higher blood glucose levels initially.

In contrast Grembowski, Anderson, Ralston, Martin, and Reid (2012) found increases in PC and ED utilization after a system redesign, which consisted of an outpatient patient-centered intervention. The intervention included four components: (a) secure website for communication between patients and providers; (b) same-day access; (c) specialist appointments without referrals; and (d) compensation for PCPs with better health outcomes. Authors reported that the intervention resulted in an over-emphasis on productivity versus patient care and more staff turnover, which may have led to an increased pace of visits and lowered patient satisfaction. Their findings suggested that the changes, albeit referenced as “patient-centered”, may have been detrimental to the patient-provider relationship.

A study of 36,000 Medicare beneficiaries with DM found that an intensive intervention designed to reduce healthcare utilization was successful. The Medicare Advantage Chronic Condition Special Needs Plan (C-SNP) consisted of house calls and care management by nurses, medication review by a pharmacist, social services, transition of care assistance, and end-of-life discussion as needed. The C-SNP patients were more likely to be female, non-White, and living in a rural area. Researchers of this interdisciplinary approach found lower admission and readmission rates, shorter length of stay (LOS), and higher outpatient rates within the C-SNP group. No racial differences were reported so this type of holistic intervention seems to have documented a method to neutralize racial disparities (Cohen, Lemieux, Schoenborn, & Mulligan, 2012), which have been documented in the literature (Laditka & Laditka, 2006).

A common methodological design used across the studies reviewed was retrospective data analysis. Although the researchers contributed to the healthcare utilization literature, the generalizability of their studies was somewhat limited. Many of the articles reviewed under this theme had very large samples; however, data extracted from medical records or databases may not have been entirely accurate. In addition, some researchers did not distinguish between DM type I and II, and based on the physiological differences and early onset of type I DM, findings are not always generalizable (Menzin et al., 2010). Comparing patients with different durations of DM and existing co-morbidities is challenging and could have confounded the results. Studies with veterans tended to be mostly males with serious physical and psychosocial issues not always reflective of the general population. Although interventions were conducted to reduce utilization, researchers reported conflicting findings. Additional research is needed to more comprehensively answer the question of the aspects of care necessary to reduce utilization rates yet maintain positive health outcomes. Other than patient satisfaction and quality of life very little psychosocial information was included in the studies, particularly around the role of the patient with self-care behaviors and patient empowerment.

Internal and External Systemic Barriers to Care and Healthcare Utilization

Internal factors consisted of patient demographics and self-management behaviors, while external factors consisted of geographic location, and insurance status and socioeconomic (SES) status. Interventions to reduce barriers were focused on the coordination of care.

Internal Factor Impacting Healthcare Utilization-Patient Demographics. Patient demographics, particularly race and SES status, are barriers to care that have been studied in four of the articles included in this theme. Laditka and Laditka (2006) found that among preventable hospitalizations there was a higher risk of hospitalization among AA and Hispanic female and male patients ages 19-64 compared to Whites. This pointed to the high possibility of a racial barrier to quality care among the minority populations studied. Their sample, of over a million patients from fourteen different states, consistently showed higher rates of chronic diseases among minority groups, more admissions and more preventable readmissions (Laditka & Laditka, 2006). AA patients were found to have the highest rate of acute DM complications and HTN, and were significantly more likely to be readmitted for CHF in an inpatient readmission study examining whether race and ethnicity impact 30-day or 180-day readmission rates. At 180 days Hispanic patients had a significantly higher chance of being readmitted compared to Whites regardless of payer. AA and Hispanic patients with Medicare were more likely than White patients to be readmitted for acute complications, lower extremity disease or renal disease, while Whites had the highest rate of ischemic heart disease, depression, and lower extremity disease (Jiang, Andrews, Stryer, & Friedman, 2005). From the same 1999 Healthcare Cost and Utilization Project (HCUP) sample, 30% of patients had two or more IPS stays equaling 55% of total IPS stays and 54% of the total hospital costs during that year. The cost for multiple stays was three times as much compared to patients with one stay with more Hispanic and AA patients in this group. Patients on Medicare/Medicaid, and those living in lower economic zip code areas were also more likely to have multiple IPS stays (Jiang, Stryer, Friedman & Andrews, 2003). Chen et al. (2012) found a high 30-day readmission rate of 18.9%, compared to a study by Jiang et al. (2005) who reported a 30-day readmission rate of 6.76% among AAs with private insurance and 12.83% among Hispanics on Medicare.

Internal Factor Impacting Healthcare Utilization-Self-Management. Patient self-management behaviors and the willingness to modify behavioral risk factors have been found to be of critical importance to patients with DM in terms of healthcare utilization. Researchers reported medication adherence and regular cholesterol testing influenced healthcare utilization rates among patients with DM. Self-management of DM based on published guidelines is critical to positive health outcomes. Patients who demonstrated initiative and followed their providers' recommendations to have their LDL cholesterol checked annually were significantly less likely to be readmitted for DM complications, as were those who practiced medication adherence by refilling statin and insulin prescriptions (Chen et al., 2012). Linking patient self-management behaviors to healthcare utilization illustrates how chronic disease management can influence outcomes and the importance of patient responsibility.

Six articles focused on the patients' medication adherence, supporting the critical nature of this chronic disease management tactic on utilization. Two studies done by same authors, (Wu et al., 2012a; 2012b) found when patients continued insulin after discharge and there was a clear coordination of care, there were lower inpatient utilization rates and inpatient-related costs, as well as better health outcomes. Among patients with higher HbA1c values (>8%), continuation of insulin was associated with 21% fewer readmissions for diabetes-related complications (i.e., hyperglycemia, diabetic ketoacidosis) (Wu et al., 2012b). Less ED and inpatient utilization resulted in lower 6-month after discharge mean healthcare costs that totaled $12,333 for those who were younger and continued on insulin. In comparison, a disruption in insulin resulted in more utilization and a higher average cost of $15,765 for patients in the six months after discharge. Wu et al., (2012a) discovered that among those who took insulin as prescribed, there were significantly lower ED and inpatient utilization rates, and higher survival rates. However, neither article written by Wu and colleagues discussed patient choice in terms of DM management options other than insulin. They also did not discuss the reasoning behind patients' non-adherence to their insulin regimen. Non-adherence may have been due to the worsening of their disease process, considering that the patients who continued insulin had a much higher HbA1c to begin with (Wu et al., 2012b).

In four studies focused on self-management, researchers found conflicting results among medication adherence, cost, and healthcare utilization variables. In one study, more medication adherence was associated with a lower risk for hospital admissions resulting in significantly lower inpatient health care costs. The study, a large retrospective cohort study (n=137,277), with patients ages 18-64, found the savings from less care were able to offset the increase in medication costs (Sokol, McGuigan, Verbrugge, & Epstein, 2005). Among the same age group, another study of Medicaid patients found that those on a capitated plan (i.e., fixed price) who were less adherent to medication prescriptions had 27% fewer outpatient visits but were 16% more likely to use the ED, and had a 14% increase in inpatient utilization. This group was significantly less adherent compared to the fee-for-service diabetic patients possibly because patients were unable to afford prescription costs after the amount they are allotted each month was expended (Pawaskar et al., 2010). However, these findings may be attributable to the patients' ages as they were younger (18-64) than many of the other studies with samples from Medicare. To demonstrate this, researchers in Michigan studied a panel of Medicare patients and found that age and disease severity influenced utilization and cost. However, higher rates of medication adherence were still associated with higher costs but lower utilization rates (Hepke, Martus, & Share, 2004). Among patients from four regions in the U.S. who were adherent to prescription instructions, adherence decreased as the patient's treatment costs increased. Gibson et al., (2010) reported that among patients who were adherent to medication, there was lower ED utilization and fewer complications (i.e., amputations, retinopathy).

Specific insured populations were represented in this theme (e.g., Medicare, Medicaid, AA) so generalizability is challenging. In addition observational and retrospective studies using medical records data dominated this theme, which may not be completely accurate. Retrospective data collection methodology limits the input of the patient so it is difficult to fully understand why all patients do not more closely adhere to prescription instructions and exercise better self-care practices.

External Factor Impacting Healthcare Utilization-Geographic Location.

Geographic location can serve as a possible barrier to accessing necessary healthcare for managing DM. Differences have been found between urban and rural areas, as well as areas designated as underserved based on the level of access to health care. One research team looked at a Medicare sample consisting of over 20,000 mostly White female patients living in rural areas with high poverty rates (Bennett, Probst, Vyavaharkar, & Glover, 2012). They found these patients had lower 30-day readmission rates, but also found that a follow-up visit seemed to predict a hospital readmission. This finding may be due to transportation barriers to access PC for those in rural areas, and poorer health status resulting in more appointments and opportunities for providers to recommend a readmission (Bennett et al., 2012). In an urban New York sample, 75% of the patients had more inpatient, ED, and home health care usage along with lower health status. The underserved group (1% Latino) in this study was less educated, more likely to be on Medicaid, had fewer inpatient stays, but reported more ED visits. The study of urban and nonurban patients done by Remler et al. (2011) found less frequent blood glucose monitoring, and less use of insulin pens among urban participants, possibly due to a lack of insurance coverage and the costliness of DM management. The nonurban group reported more physical activity and more healthy eating days.

Using a geographic information system, researchers found utilization and cost differed by disease processes across twenty-two geographic locations among veterans. The costs for patients with DM were similar to heart disease, psychiatric disorders, and substance abuse (Yu et a., 2004); however, other than disclosing that patients may have had more than one comorbid disease process, it was unclear how more than one diagnosis influenced utilization or cost. The use of archival data does not lend itself to the exploration of the patients’ experience including the difficulty in DM management with comorbid psychiatric diagnoses, particularly in rural areas where access to health care has been shown to be a challenge. A recent mixed-methods study done at an urban university affiliated medical center, looked at barriers to health care among hospitalized patients with chronic medical conditions, among them DM. Results showed that those with access to regular PC and admitted through a provider, were more likely to be married, educated, male, and White (Hossain, Ehtesham, Salzman, Jenson, & Calkins, 2013) alluding to the importance of patient demographics when looking at healthcare utilization.

External Factor Impacting Healthcare Utilization-Insurance Status and Socioeconomic Status. Patients on Medicare, Medicaid, or those with private insurance have also been found to have varying rates of utilization, which supports the notion that insurance status or lack of insurance serves as yet another barrier to care for patients with DM. In a study conducted in Chicago with 63.3% of the sample AA, HbA1c values were lower for the 30% of patients with insurance but were not directly related to access to PC. The majority of patients had fewer financial resources with an annual household income of less than $10,000 (Schiff, Ansell, Goldberg, Dick, & Peterson, 1998), once again highlighting differences in health outcome by patient demographics. For those patients without insurance (52%) who would have had to pay to see a provider, Wheeler et al. (2004) found the lowest follow-up rates after a hospitalization. In one study (Hossain et al., 2013), 45% of the subjects did not have a regular PCP and 75% of these patients were AA males. In yet another study, AA patients also had the highest rates of utilization which included going to the ED at least three times in the previous year, missed appointments and walk-in appointments. More than half had insurance through the federal government, yet three-quarters of the patients with some type of insurance did not consistently adhere to their prescriptions, perhaps due to the lack of continuity in care (Hossain et al., 2013) so there appear to be a powerful systems of barriers.

Interventions to Reduce Internal and External Barriers to Care. Systemic barriers impacting healthcare utilization among patients with DM and their providers are readily apparent in the literature. Twenty-six articles containing outcomes related to barriers to care, usage, and health outcomes among patients with DM from different geographic locations, race, ethnicity, and SES across inpatient and outpatient settings were included in this theme. Geographic location and access along with patient demographics, and insurance status have been found to be barriers to care.

To more closely examine coordinated care as a solution to barriers two research teams, publishing from the same data set collected in Chicago, found patients without a regular provider (61%) accessed more urgent care clinics compared to those with continuity of care (38.5%) who had more scheduled PC visits and fewer walk-in visits. When patients had a PC visit within three months of a walk-in visit they were found to have fewer walk-in visits in the future (Ansell et al., 2002). The same patients with a consistent provider also received more of the six ADA DM care standards: eye exam, foot exam, blood glucose test, cholesterol test, influenza vaccine, and an appointment with a registered dietician (Schiff et al., 1998). In further exploring care coordination and health system fragmentation, one study found an average of nineteen outpatient visits and 1.2 ED visits in the two years of the study for all DM patients with kidney disease. Those with highest fragmentation of care index (FCI) scores had twice as many visits and more comorbid conditions (Liu, Einstadter, & Cebul, 2010).

Studies on the internal and external systemic barriers of care lend themselves to the sociological concept of the burden of health disparities and insufficient healthcare insurance among patients from different geographic, racial backgrounds, as well as SES statuses. Patient demographics impacting healthcare utilization, such as age, geographic location, and SES status, are also important to consider particularly as the baby boomer generation ages and more burden is placed on the Medicare system. Limitations in these studies include the use of archival data, which may have been incomplete or included documentation errors without the option to gather more information; disease severity among the participants was not reported; type I and II DM were often combined; and health care access across the United States varies greatly so findings may not be generalizable. Among the studies reviewed in this section, data was not gathered on psychosocial issues that could be contributing to patient access and management of DM or the patients' beliefs about health disparities or barriers to care. Access to care in rural areas is challenging, but more care was found to increase subsequent utilization. Perhaps this was because providers were aware that patients have difficulty getting to PC practices so aired on the side of caution by admitting patients.

Attachment Style and Healthcare System Interactions

Attachment styles, DM, healthcare utilization and interventions are summarized in the following section. Similar to the barriers to care articles, attachment based interventions included an integrated care approach.

Attachment Style and Diabetes. Seven empirical research studies focused on the attachment styles of patients' with DM and their interactions with the healthcare system. The seven articles included in this theme focused specifically on DM management and patients with co-morbid depression. The researchers explored linkages with healthcare utilization patterns through the examination of adult attachment styles. With the inclusion of attachment styles, researchers were able to study psychosocial aspects of DM care compared to demographics and measurable biomedical markers like HbA1c. Consistently, findings supported that those with more anxious styles used more health care yet had poorer health outcomes, and struggled more with depression. Interestingly, all seven studies were conducted in PC clinics in Seattle, Washington. Three samples were taken from The Pathways Epidemiology Study (PES), conducted between 2000 and 2002. The PES consisted of surveying a large sample of a predominantly homogenous population (n=4893) within the Group Health Cooperative, which is made up 30 outpatient PC clinics. The remaining four studies included samples from the same system of clinics: 1) one RCT with 324 females; 2) one qualitative interview study with 27 patients from the Diabetes Care Center; 3) a follow-up survey to 701 females; and 4) and a cross-sectional study with 367 patients from two of the clinics.

The first five published studies used the Relationship Questionnaire (Bartholomew & Horowitz, 1991) to cluster the patients into one of four attachment styles (see Figure 2), but the two most recent articles grouped the four styles into either independent (fearful and dismissing) or interactive (secure and preoccupied). Interactive relationship style patients were significantly more likely to be single, male, White, educated, with a higher BMI yet a lower death rate of 29 per 1,000 compared to 39 per 1,000 as found in the independent group (33% higher based on the unadjusted RR) (Ciechanowski et al., 2010). Having a negative view of dependency, independent style patients reported a lack of social support, more traumatic family relationships, less satisfaction with care, as well as less often feeling understood. More independent style patients had type I DM and more depression symptoms as measured by the Hopkins Symptom Checklist (HSCL-20) (Ciechanowski, Russo, Katon, Von Korff, et al., 2006).

Researchers found the application of attachment theory (Bowlby, 1977) to diabetic health care provided a framework to understanding outpatient patient behaviors and needs. Those with a dismissing style tended to be more self-sufficient as well as less adherent compared to secure patients. Preoccupied patients had lower HbA1c values (Ciechanowski et al., 2004); while those with a dismissing style who also had poor patient-provider communication had significantly higher HbA1c values (1.01% higher). Dismissing patients were also found to be significantly less adherent to glucose monitoring and experienced more interruptions in treatment defined as a prescription refill that was overdue by more than fourteen days (Ciechanowski et al., 2001), while secure patients had more stringent adherence which could have been attributed to a collaborative patient-provider relationship (Ciechanowski et al., 2004). The behaviors of dismissing style patients may be an adaptive response to early childhood experiences with caregivers that were unavailable or negligent (Ciechanowski et al., 2001).

In several studies, patient demographics including age, marital status, household income, ethnicity, along with the diagnosis of depression were all associated with relationship styles. Two teams of researchers reported finding approximately the same percentages of each attachment style in their samples: 44% secure, 35% dismissing, 12% fearful, and 8% preoccupied (Ciechanowski et al., 2004; Ciechanowski, Russo, Katon, Simon, et al., 2006). Those with a preoccupied style, who have been found to be emotionally dependent with low self-esteem, were significantly more likely to be married than those with a fearful style. Those with a dismissing style, who tend not to trust easily and are independent, were older than fearful and preoccupied style patients. Dismissing style patients were also less likely to be White compared to preoccupied (Bartholomew & Horowitz, 1991; Ciechanowski, Walker, Katon, & Russo, 2002). Fearful types are afraid of rejection, while the secure type is more readily able to trust and accept affection (Bartholomew & Horowitz, 1991). The last study looked at adherence by attachment style and also assessed for depression. Again, the dismissing style was found to have less glucose monitoring adherence and more prescription interruptions (Ciechanowski et al., 2001).

Attachment Style and Healthcare Utilization. In terms of attachment style and healthcare utilization, preoccupied patients with depression had significantly more scheduled outpatient and same day visits (Ciechanowski, Russo, Katon, Simon, et al., 2006), possibly due to their dependent nature and need for contact (Ciechanowski et al., 2002). Fearful patients had significantly more same day but fewer scheduled preventive care visits compared to secure, while dismissing and fearful had more missed appointments. This may be due to fearful patients being less likely to want to schedule an appointment and a preference for utilizing more emergent care settings to avoid a close relationship (Ciechanowski, Russo, Katon, Simon, et al., 2006). In a study of female patients ages 18-65, preoccupied and fearful types significantly reported more somatic symptoms compared to secure types, which seems to fit with the relationship style in that they need to depend on others but remain anxious. Fearful, dismissing, and secure types also had significantly lower healthcare costs than preoccupied because of lower utilization rates (Ciechanowski et al., 2002) (see Figure 3).

In a 2006 qualitative study, Ciechanowski and Katon found that secure patients reported being able to navigate complex healthcare systems and get their needs met, while fearful patients were more sensitive to rejection from partners or providers and had more difficulty. Fearful patients have been found to have a high level of symptom reporting, but also a high number of missed appointments. Dismissing style patients were more concerned with control, and both dismissing and fearful were more aware of power differentials between themselves and providers, as well as reporting more difficulty with trust. These two styles were found to be the most detrimental in terms of death rate and missed appointments (Ciechanowski, Russo, Katon, Simon, et al., 2006).

Attachment Style and Healthcare Utilization Interventions. Incidentally, the study conducted by Ciechanowski and Katon (2006), along with others, point to the usefulness of an integrated care intervention focused on motivation and patient empowerment in terms of management decisions and strategy for self-care (Ciechanowski et al., 2004; Ciechanowski et al., 2002). In other words, empowerment may be critical for dismissing patients, preoccupied patients may benefit from more appointments that could be with ancillary providers, and all patients could benefit from more provider education about attachment (Ciechanowski et al., 2002). The collaborative care intervention for depressed patients, which included additional in person or phone contact with providers, medications, or problem-solving techniques from nurses, was found to have had a positive impact on independent style patients, but not among the interactive style likely due to the fact that these patients already had the skills necessary to interact with a complex health care system. The independent group had fewer depression plagued days with the collaborative care intervention which may have been due to the proactive nature of the intervention as well as the option of selecting from multiple ways of interacting with providers. There is a need to better understand which aspects of collaborative care are most beneficial to specific patients (Ciechanowski, Russo, Katon, Von Korff, et al., 2006), particularly those with an independent attachment style.

Although the seven studies contributed to the attachment and healthcare utilization literature, the generalizability of the studies within this theme is somewhat limited. All studies were published by various combinations of the same authors, and included patients from the same geographical region in the northwest United States, who were predominantly White, educated, defined as at least one year of college, and insured. Additional studies are needed with rural, ethnically diverse patient populations across the United States with varied educational levels and access to affordable healthcare. In addition, some of the research teams examined depression so the findings may not be generalizable to non-depressed samples or samples with other mental health issues.

All four-attachment styles were not always included in the analysis so future research may need to focus more on the preoccupied type to better understand the patients' needs. In addition, for purposes of replication, researchers should be explicit in their methods of combining attachment styles. With those less frequently occurring attachment styles it may be difficult to have appropriate statistical power to analyze data and draw accurate conclusions. Most studies were cross-sectional in nature and do not lend themselves to causal relationships; therefore, longitudinal studies and RCTs are needed to help enhance what has been reported. Not all studies included data on the impact of social support, and none of them examined distress levels in terms of the most problematic aspects of managing diabetes influencing utilization patterns.

Discussion

This systematic review was done to study the known relationships between outpatient and inpatient healthcare utilization, internal and external barriers, and adult attachment styles among patients with DM. Based on the findings several recommendations are extended for future research. Attachment styles have been found to be consistent over time similar to a personality type (Scharfe & Bartholomew, 1994) and are useful in the exploration of relationship patterns. However, more needs to be understood in regard to what patients relationally need from their providers for treatment adherence to occur, and how best to establish and maintain a productive patient-provider relationship.

Outcome studies on the influence of provider education about attachment styles, along with those of the interdisciplinary care team, could establish a mechanism for clear and unfragmented care coordination, and better integrate the care of emotional as well as physical health. Additionally, more knowledge is needed about what patients report to be most difficult in terms of DM distress, as well as the external systemic barriers often faced by patients with chronic diseases, and how this may impact utilization rates in both the outpatient and inpatient healthcare setting. As barriers to care are not always contained within the patient, between the patient-provider relationship, or as a result of treatment guidelines, it will also be important to further engage communities in community-based research studies to better understand and problem solve external barriers to healthcare for DM among diverse populations. These aspects of care could then be linked to utilization patterns, the establishment of patient-provider relationships, and health care outcomes.

Overall, many of the research teams in this review used archival databases that may have limited the data or ability to obtain robust information. There was also a lack of psychosocial information collected to comprehensively understand utilization patterns, particularly in regard to social support or distress from managing and living with DM. None of the studies included in this review reported the relationship style for anyone else other than the patient (i.e., caregivers, healthcare providers, spouse/partner), or the influence of a perceived attachment style based on a patient's health history, demographic factors, or providers' reputation in the community. In terms of healthcare settings, prospective studies examining attachment were done with outpatient PC patients, but more research is needed with hospitalized patients with DM to better understand behaviors and needs in relation to healthcare utilization. This would lead to further exploration of the relational aspects of readmissions, particularly among those patients admitted frequently, or readmitted within 30-days.

Limitations

Several limitations must be acknowledged in terms of this systematic review. First, articles may have been missed and only those that were published were included. However, two researchers were utilized in an attempt to avoid pertinent research being excluded. Second, only quantitative or qualitative research studies conducted in the United States were included based on the difficulty in comparing healthcare systems around the world. Third, DM was the only chronic disease process included, although findings may be applicable to other chronic health conditions.

Conclusion

In sum, according to the literature reviewed, a more systemic and relational perspective is needed to fully explore the relationship between the patient’s attachment style, perceived and real barriers to care, and healthcare utilization patterns. Additional research is needed to help narrow gaps in transitions from inpatient to outpatient care and address disparities that limit access to and quality of healthcare for adult patients with DM.

Providers could implement care strategies with less secure patients, particularly those with dismissive or fearful attachment styles, to establish and build more secure relationships; engage in healthy productive behaviors to manage diabetes effectively; allow for open communication so patients can share personal circumstances that may hinder their management strategies; have an awareness of their non-verbal communication; and take time during appointments to address patient questions. “Interpersonal validation and a sense of safety must be attained before adequate treatment adherence, optimal health care utilization patterns and effective self-management” are effective for insecurely attached patients (Ciechanowski & Katon, 2006, p. 3077).

Patients may avoid going to their PCP, and instead use emergent care paths, because of attachment or relationship issues. This may result in additional hospitalizations rather than a continuous provider-patient relationship that includes self-management guidance and close monitoring of health outcomes. Attachment theory provides an avenue to look at process options to help those patients who may be labeled as non-compliant to determine if viable options are in place for them or if additional resources need to be identified. Provider education about attachment along with a broadening of the interdisciplinary care team could establish a mechanism for clear and unfragmented care coordination, along with the care of emotional as well as physical health.

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Table 1

Search Terms and Results

	Search Terms: MEDLINE via PubMed (English, Humans, 19 years of age or older, United States, research studies, diabetes, no educational interventions; Article type (RCT, meta-analysis, systematic reviews, clinical trials, reviews, journal article)	# of Results		Search Terms: PsycINFO (English, Humans, Adulthood 18 years of age or older, United States, research studies, diabetes, no educational interventions; Publication Type (peer reviewed journal), Document type (journal article, review - any)	# of Results		Search Terms: All EBM Reviews - Cochrane DSR, ACP Journal Club, DARE, CCTR, CMR, HTA, and NHSEED, Health and Psychosocial Instruments 1985 to April 2013, Ovid Healthstar 1966 to April 2013. English, Humans	# of Results
1	diabetes and attachment theory (5 include, 4 exclude)	9		diabetes and attachment theory (3 excludes, 6 duplicates)	9		diabetes and attachment theory (1 exclude, 7 duplicates)	8
2	attachment theory, diabetes, and readmissions	0		attachment theory, diabetes, and readmissions (0 include, 12 excludes, 7 duplicates)	19		attachment theory, diabetes, and readmissions	0
3	attachment theory, diabetes, and readmission	0		attachment theory, diabetes, and readmission (3 include, 36 excludes, 6 duplicates)	45		attachment theory, diabetes, and readmission	0
4	attachment theory and hospitals (30 exclude)	30		attachment theory and hospitals in the United States (9 exclude)	9		attachment theory and hospitals in the United States	0
5	attachment theory and hospital readmissions (1 duplicate)	1		attachment theory and hospital readmissions (1 duplicate)	1		attachment theory and hospital readmissions	0
6	attachment styles and hospital readmissions	0		attachment styles and hospital readmissions	0		attachment styles and hospital readmissions	0
7	attachment styles and hospitals (1 exclude, 1 duplicate)	2		attachment styles and United States hospitals (2 exclude, 1 duplicate)	3		attachment styles and United States hospitals	0

Table 1

	Search Terms: MEDLINE via PubMed (English, Humans, 19 years of age or older, United States, research studies, diabetes, no educational interventions; Article type (RCT, meta-analysis, systematic reviews, clinical trials, reviews, journal article)	# of Results		Search Terms: PsycINFO (English, Humans, Adulthood 18 years of age or older, United States, research studies, diabetes, no educational interventions; Publication Type (peer reviewed journal), Document type (journal article, review - any)	# of Results		Search Terms: All EBM Reviews - Cochrane DSR, ACP Journal Club, DARE, CCTR, CMR, HTA, and NHSEED, Health and Psychosocial Instruments 1985 to April 2013, Ovid Healthstar 1966 to April 2013. English, Humans	# of Results
8	diabetes and attachment styles (1 include, 4 exclude, 2 duplicate)	7		diabetes and attachment styles (4 exclude, 6 duplicates)	10		diabetes and attachment styles (7 duplicates)	7
9	hospital readmission rates and diabetes in the US (7 includes, 39 excludes, 4 duplicates)	50		hospital readmission rates and diabetes in the US (3 duplicates)	3		hospital readmission rates and diabetes in the US (10 excludes, 2 duplicates)	12
10	attachment theory and health care utilization (1 include, 9 exclude, 1 duplicate)	11		attachment theory and health care utilization (1 exclude, 3 duplicates)	4		attachment theory and health care utilization	0
11	attachment theory and primary care (33 exclude, 7 duplicates)	40		attachment theory and primary care (15 exclude, 9 duplicate)	24		attachment theory and primary care (7 exclude, 7 duplicate)	14
12	diabetes and outpatient healthcare utilization in the US (19 include, 106 exclude, 3 duplicate)	128		diabetes and outpatient healthcare utilization in the United States	0		diabetes and outpatient healthcare utilization in the United States	0
13	diabetes and inpatient healthcare utilization in the United States (10 include, 72 excludes, 43 duplicates)	125		diabetes and inpatient healthcare utilization in the United States	0		diabetes and inpatient healthcare utilization in the United States	0

Table 1

	Search Terms: MEDLINE via PubMed (English, Humans, 19 years of age or older, United States, research studies, diabetes, no educational interventions; Article type (RCT, meta-analysis, systematic reviews, clinical trials, reviews, journal article)	# of Results		Search Terms: PsycINFO (English, Humans, Adulthood 18 years of age or older, United States, research studies, diabetes, no educational interventions; Publication Type (peer reviewed journal), Document type (journal article, review - any)	# of Results		Search Terms: All EBM Reviews - Cochrane DSR, ACP Journal Club, DARE, CCTR, CMR, HTA, and NHSEED, Health and Psychosocial Instruments 1985 to April 2013, Ovid Healthstar 1966 to April 2013. English, Humans	# of Results
14	hospital readmission rates and diabetes and attachment theory in the United States	0		hospital readmission rates and diabetes and attachment theory in the United States	0		hospital readmission rates and diabetes and attachment theory in the United States	0
15	diabetes and outpatient healthcare utilization and attachment theory in the United States	0		diabetes and outpatient healthcare utilization and attachment theory in the United States	0		diabetes and outpatient healthcare utilization and attachment theory in the United States	0
16	diabetes and inpatient healthcare utilization and attachment theory in the United States	0		diabetes and inpatient healthcare utilization and attachment theory in the United States	0		diabetes and inpatient healthcare utilization and attachment theory in the United States	0
		403			127			41

Table 2

Summary Table

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
Hossain, Ehtesham, Salzman, Jenson, & Calkins, 2013	Are there barriers to health care for patients with chronic medical conditions (CMC), and if so are they related to disparities?	Survey Interview	Insurance, PCP, Utilization, Medication cost, language barrier	45-item interview	100 hospitalized patients ≥18 with a CMC/44% White, 46% AA, 10% Hispanic and 55% female; only 16% had a college education; 84% were admitted through the ED	Kansas City, MO	Those who saw a PCP regularly were more likely to be married, educated, male and White; 45% did not have a regular PCP and 75% of these patients were AA males; 59% had government issued insurance; 76% with insurance did not adhere to Rx; 46% went to the ED at least 3 times in the last year and 58% missed appointments	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Bennett, Probst, Vyavaharkar & Glover, 2012	Are patients living in rural areas with DM on Medicare more likely than those in urban areas to experience a readmission within 30 days?	Archival Medicare sample (2005)	30 day hospital readmission	Research Data Assistance Center (RES-DAC) Chronic Conditions Warehouse (CCW)	21,275 (mostly female and White)	5% Medicare sample	Rural residents had lower 30 day readmission rates but a follow-up visit seemed to predict a readmission instead of providing protection against hospitalization	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
								Care and Healthcare Utilization
Chen, Ma, Chen, & Yermilov, 2012	Does quality of care impact 30-day readmissions rates among DM patients?	Archival	2-30 day readmission rates	Insurance claims data	30,139	United States	18.9% readmit rate with predictors included prior admission and ED visit; Patients with an LDL check and who filled insulin Rx were less likely to be readmitted	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Cohen, Lemieux, Schoenborn, & Mulligan, 2012	For Medicare patients with DM, did the Chronic Special Needs Plans (C-SNPs) impact healthcare utilization?	Archival	Utilization	Fee-for-service compared to C-SNP data from the XL Health Corporation (Care Improvement Plus)	36,000 Medicare patients	SC, GA, TX, AR & MO	C-SNP patients with DM more likely to be female, non-White and living in a rural area. Program consisted of house calls and care management by nurses; medication review; social services, transition of care assistance, and end-of-life discussion as needed. Lower admission and readmission rates, shorter LOS, and	Outpatient and Inpatient Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							higher outpatient rates were all found among the C-SNP group	
Grembowski, Anderson, Ralston, Martin, & Reid, 2012	Were there changes in utilization and cost with the implementation of organizational changes following IOM recommendations?	Single group interrupted time series	Utilization Costs Comorbidity	Data warehouse Cost management system ICD-9 codes	9871	Group Health, Seattle, WA	PC visits initially decreased, but then increased when secure messaging was initiated. Specialty visits increased as did ED. Costs also increased from $1946 in 1998 to $3295 in 2006	Outpatient and Inpatient Healthcare Utilization
Wu, Zhou, Yu, Lu, Sharma, Gill, & Graf, 2012b (Outcomes associated with post-discharge insulin continuity)	Is there a risk of readmission among T2DM patients initiated on insulin while hospitalized and continued on insulin therapy after hospital discharge?	Observational, retrospective database study with electronic medical records comparing those who continued on insulin and those who did not	HbA1c Reduction & Achievement Hypoglycemia Readmission	Electronic medical record	732 patients ≥18 years of age with a HbA1c ≥8%, not on insulin prior to admission, with clinic appointments ≥180 days before discharge and 90 days after/96.8% White	US health system with >700 multispecialty physicians, 3 hospitals, 40 clinics, 3 research centers and a health plan	24.6% of patients continued insulin with HbA1c levels significantly reduced by 1.67%, but they also started with lower levels or better glucose control. Continuation was associated with 19% fewer readmissions for any reason and 21% fewer for diabetes-related among those with A1c levels >8% at 1 year	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Wu, Zhou, Yu, Lu,	Does a disruption in insulin impact	Observational, retrospective	HbA1c Reduction	Electronic medical record	2160 admitted patients ≥18	US health system with	851 continuation patients were	Outpatient and

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
Sharma, Gill, & Graf, 2012a (Outcomes associated with insulin therapy disruption)	clinical and cost outcomes after discharge in T2DM patients who had used insulin within 30 days before hospitalization and while admitted?	database study with electronic medical records comparing those who continued on insulin and those who had a disruption	Hypoglycemia Use of urgent care Cost		years of age with discharge home and prior use of insulin with clinic appointments ≥180 days before discharge and 90 days after/97.6% White	>700 multispecialty physicians, 3 hospitals, 40 clinics, 3 research centers and a health plan	younger, had less utilization, a 0.51% significant reduction in HbA1c with no increased risk of hypoglycemia, and a higher rate of survival. Mean health care costs were $12333 compared to $15765 in disruption group	Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Remler, Teresi, Weinstock, Ramirez, Eimicky, Silver, & Shea, 2011	Are there differences between urban and nonurban underserved adults with DM?	Survey	Utilization Health Status Self-care	Medical Expenditure Panel Survey (MEPS) Self-report	755 urban patients (75% Latino)/867 nonurban patients (1% Latino)	Medically underserved area in NY	Underserved group was less educated, more often on Medicaid, fewer IPS stays but more ED visits; Urban group used IPS, ED and home health care, lower health status	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Prentice, Fincke, Miller, & Pizer, 2011	Is there a relationship between wait time and glycemic control in a VA population?	Archival	Wait time	Mean wait time for next PC appointment for new patients	84,244/98.2% male and 73.1% White	VA Clinics	HbA1c levels increased 0.14% when the average wait time was longer than 32.5 days. For those with an A1c >8% to begin with the	Outpatient and Inpatient Healthcare Utilization Internal and

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							rate increased 0.18%.	External Systemic Barriers to Care and Healthcare Utilization
Ciechanowski, Heckbert, Russo, Von Korff, Katon, Williams, Lin, Young, & Ludman, 2010	Do non-depressed diabetic patients with an independent relationship styles have higher mortality over a 5-year period compared to patients with an interactive style?	Survey (Pathways Epidemiology Study)	Relationship Style Mortality RxRisk (chronic disease score) Complications	RQ 4-item Death registry Rx drug use	3535 diabetic patients ≥18 years of age on a diabetes registry/80.8% White	9 of 30 primary care outpatient clinics in the Group Health Cooperative (GHC) near Seattle	Interactive relationship style patients were significantly more likely not to be married, to be male, White, educated, with a significantly higher BMI yet a lower death rate of 29 per 1,000 compared to 39 (33% higher based on the unadjusted RR) in the independent style group	Attachment Style and Healthcare System Interactions
Gibson, Song, Alemayehu, Wang, Waddell, Bouchard, & Forma, 2010	What are the relationships between cost sharing, adherence to oral antidiabetic medication (OAD), and utilization?	Retrospective, cross-sectional study (Thomson Reuters MarketScan Database 2002-2006)	Adherence Cost sharing (co-payment) Utilization	Percentage of days covered (PDC) Cost-share index ED, Inpatient (IPS), outpatient visits	96,734/46% female	4 US Census Regions (Northeast, North Central, South, West)/75% of patients lived in an urban area	¾ of patients were adherent, however as cost sharing increased adherence decreased; lower utilization among adherent patients and fewer complications	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
								Healthcare Utilization
Kim, Ross, Melkus, Zhao & Boockvar, 2010	Are there differences between older patients with DM who have scheduled and unscheduled readmissions?	California State IPS Dataset	Scheduled/ Unscheduled Readmission Rates	Unscheduled (not scheduled 24 hours in advance)	124,967 diabetic patients ≥50 years of age (52.7% female)/54.8% White	2006 California State IPS Dataset	26.3% were readmitted within 0-3 months with 87.2% unscheduled and 19% of them preventable. Cost of 27,500 IPS days was $72.7 million. Patients more likely to be readmitted were over 80, Black or Hispanic, male, more co-morbidities, on public insurance, living in an urban and low-income area, those on Medicare, and patients with an admission in the previous 3 months	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Liu, Einstadter, & Cebul, 2010	How does care fragmentation impact complex DM patients with kidney disease?	Archival	ED visits in 2002 & 2003 Fragmentation	EMR records Fragmentation of Care Index (total of visits, visits to clinic and number of clinics)	3873 with DM; 623 with DM & kidney disease/73.8% female/ 44% Black	Ohio	Average of 19 outpatient visits and 1.2 ED visits in the two years of the study for all patients. Those with highest FCI	Outpatient and Inpatient Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							scores had twice as many visits and more comorbid conditions	Internal and External Systemic Barriers to Care and Healthcare Utilization
Menzin, Korn, Cohen, Lobo, Zhang, Friedman, & Neumann, 2010	What are the relationships between glycemic levels, IPS stays and costs for patients with DM?	Retrospective cohort study	Glycemic control Utilization Costs	A1c % IPS claims HCUP data	9887 (2002-2006) (52% male)	Massachusetts	Patients with A1c values above 10% had 2.25 times more IPS admissions compared to those <7%; patients with 1 admission and higher A1c had higher costs	Outpatient and Inpatient Healthcare Utilization
Pawaskar, Burch, Seiber, Nahata, Iaconi, & Balkrishnan, 2010	Does the type of health plan influence economic outcomes among patients with DM type 2?	Retrospective case-control cohort study	Medication adherence Utilization Type of health plan	Pharmacy records Number of outpatient and IPS visits and odds of ED visit Capitation or fee for service	8581 patients on Medicaid/67.9% female/60.3% White	8 states (at least 1 from each region)	Capitated plan patients had 27% fewer outpatient visits; 16% more likely to visit and ER; 14% increase in IPS stays; significantly lower (11%) medication adherence compared to fee for service patients	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Kim & Boye, 2009	What are the admission rates for patients with	Annual Cross-sectional survey	Hospitalizations	Nationwide Inpatient Sample (NIS)	8 million records from 1000	United States sample	100 admissions for every 1000 people in the US in 2005 and 303 for every	Outpatient and Inpatient

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
	DM, and what are the costs?		Cost	(part of Healthcare Cost and Utilization Project (HCUP)) Hospital charges	community hospitals		1000 among DM type 2; $14,300 without DM, $13,700 for type 1, $16,200 for type 2 totaling $795 billion; 20.9% of the admissions came from the 7% of DM patients	Healthcare Utilization
Ciechanowski, Russo, Katon, Von Korff, Simon, Lin, Ludman, & Young, 2006	Do depressed diabetic patients with an independent relationship style do better with an intervention designed to have more contact with patients than interactive relationship style patients?	RCT	Relationship Style Depression Patient Satisfaction Trauma Social support Medications	RQ 4-item HSCL-20 Health Care Climate Questionnaire Childhood Trauma Questionnaire Interpersonal Support Evaluation List Pharmacy records	324 (65.4% female; 79.0% ≥1 yr of college)/78.2% White	9 of 30 primary care outpatient clinics in the Group Health Cooperative (GHC) near Seattle	2/3 of patients were depressed with more depression free days among those patients in the intervention arm. Independent style patients reported no social support, trauma, less satisfaction with and DM care. Intervention (collaborative care) for depressed patients in the independent style had positive results. Interactive style patients, did not benefit the intervention	Attachment Style and Healthcare System Interactions
Ciechanowski & Katon, 2006	Are T2DM patients with dismissing and	Semi-structured interviews	Attachment	RQ 4-item	27 (16 females, 11 men; 9 minorities)	Seattle	11 dismissing, 11 fearful, 2 secure; Fearful patients are	Attachment Style and Healthcare

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
	fearful attachment styles less satisfied, trusting, and less able to navigate a health system compared to secure relationship style patients?						sensitive to rejection while dismissing ones are more concerned with control. Secure patients can cope with complex systems	System Interactions
Ciechanowski, Russo, Katon, Simon, Ludman, Von Korff, Young, & Lin, 2006	Are relationship styles associated with missed appointments among patients with diabetes?	Survey (Pathways Epidemiology Study)	Depression Attachment Medical comorbidity Treatment intensity DM complications Primary care visits	PHQ-9 RQ 4-item RxRisk, Pharmacy data ICD-9 codes Primary care utilization	3923	9 of 30 primary care outpatient clinics in the Group Health Cooperative (GHC) near Seattle	43.9% secure 35.8% dismissing 8.1% preoccupied 12.2% fearful 12.4% depressed Significant differences between attachment styles and depression by demographic variables. Preoccupied and depressed patients had significantly more scheduled and same day visits. Fearful had significantly more same day but fewer scheduled preventive care visits compared to secure. Dismissing and fearful had more missed appointments	Attachment Style and Healthcare System Interactions Outpatient and Inpatient Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
Fenton, Von Korff, Lin, Ciechanowski, & Young, 2006	Do patients with infrequent outpatient visits lack preventive services? Do patients with frequent low-priority visits lack DM care?	Survey	Utilization Depression 7 Complications	Infrequent (<8 visits) Lower priority user (lower priority or ill-defined diagnoses) High priority (< 50% of visits were for low priority diagnoses) PHQ-9 Diagnoses	4463/48.7% female/20.4% non-White	GHC	The 1/3 of infrequent users had a significantly less chance of an A1c, retinal exam or microalbumin but were younger and more healthy; High priority patients were older with more complications and had twice as many high priority visits	Outpatient and Inpatient Healthcare Utilization
Kalsekar, Madhavan, Amonkar, Scott, Douglass, & Makela, 2006	How does depression impact health care utilization among patients with DM?	Retrospective cohort study	Depression	ICD-9 code for single-episode major depressive disorder, MDD, recurrent episode MDD, neurotic depression/chronic depression/dysthymia and depression NOS and at least 1 IPS admission for depression	4294 type 2 DM patients (1525 with depression)	West Virginia	Patients with depression had more comorbid conditions, more office and IPS utilization, more prescriptions filled, and costs were 65% higher than those without depression	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Laditka & Laditka, 2006	What are the associations between preventable hospitalizations and race and ethnicity?	Survey	Preventable admissions Race/ethnicity	1997 NIS	n=1.7 million	14 states	Higher risk of hospitalization among AA and Hispanic female and male patients ages 19-64 compared to Whites	Outpatient and Inpatient Healthcare Utilization Internal and

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
								External Systemic Barriers to Care and Healthcare Utilization
Jiang, Andrews, Stryer, & Friedman, 2005	Does race/ethnicity impact hospital readmissions for patients with DM by looking at 30-day and 180-day rates?	1999 HCUP State IPS Databases	Readmission	State IPS Databases		California, Missouri, New York, Tennessee, Virginia	Blacks had highest rate of acute complications and HTN; significantly more likely to be readmitted for CHF, and acute complications if on Medicaid. Hispanics had the highest rate of renal disease. At 180 days Hispanics had a significantly higher chance of being admitted compared to Whites regardless of payer. Whites had the highest rate of ischemic heart disease, depression and lower extremity disease. Blacks and Hispanics on Medicare were more likely than Whites to be readmitted for	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							acute complications, lower extremity disease or renal disease	
Sokol, McGuigan, Verbrugge, & Epstein, 2005	How does medication adherence impact health care utilization?	Retrospective Cohort Study	Costs Utilization Adherence Comorbidity	Medical, drug and health care costs Claims data ICD-9 codes	137,277 ages 18-64/51.1% male		Significantly lower cost with more adherence as well as lower risk for IPS care. Savings from less care offset increase in medication costs	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Ciechanowski, Russo, Katon, Von Korff, Ludman, Lin, Simon, & Bush, 2004	Do self-reliant and less trusting patients have poorer collaboration with health care providers?	Survey (Pathways Epidemiology Study)	Attachment DM Self-Care Depression Patient-Provider Relationship Adherence DM Complications Glucose control	RQ 4-item Summary of DM Self-Care Activities PHQ-9 3-items Pharmacy data ICD-9 codes HbA1c	4095/79.5% White	9 of 30 primary care outpatient clinics in the Group Health Cooperative (GHC) near Seattle	Secure (44.1%) Dismissing (35.7%) Preoccupied (8.0%) Fearful (12.2%) Dismissing style is self-sufficient and was less adherent compared to secure. Preoccupied style had lower A1c values	Attachment Style and Healthcare System Interactions
Hepke, Martus, & Share, 2004		Retrospective Cohort Study	Pharmaceutical use/adherence	Rx fill rates	57,687 Non-Medicare BCBS	Michigan	Higher adherence to medication increased cost but	Outpatient and Inpatient

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
			Medical costs & Utilization rates	IPS, outpatient, ED, clinic, tests, services, Rx	DM patients in 1999; 55% male		lowered utilization; age and disease severity were related to costs and utilization	Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Himelhoch, Weller, Wu, Anderson, & Cooper, 2004	What is the relationship between depression and ED utilization among patient with chronic diseases?	Cross-sectional	ED, IPS, or ambulatory care sensitive condition (ACSC) IPS stay Chronic disease (CAD, DM, CHF, HTN, prostate, breast, lung and colon cancer) Depression	CMS 1999 data ICD-9 codes ICD-9 codes	60,382 Medicare patients 65 years and older with depression (sample from 1.2 million Medicare patients)/89% White/60% female	United States	Patients with depression were more often White (92%), older and female and two times as likely to utilize ED or IPS	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Husaini, Hull, Sherkat, Emerson, Overton, Craun, & Levine, 2004	What is the relationship between DM, depression and utilization among AA patients?	Interview	DM Depression Utilization	Self-report of DM PRIME-MD (9-items) and CES-D (20-items) MD visits, ED, IPS	303 AA patients age 40 and older	Primary Care Clinic in Nashville, TN	No significant relationship between DM and depression; Patients with only DM had a significantly lower amount of IPS stays, patients with only depression had more MD	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							visits, and those with both had 2.75 times the number of ED visits and 3 times the number of IPS days	Care and Healthcare Utilization
Huang, Gleason, Gaudette, Cagliero, Murphy-Sheehy, Nation, Singer, & Meigs, 2004	Is there an IPS utilization difference among DM patients who go to a diabetes clinic (DC) compared to a general medicine clinic (GMC)?	Archival	Hospitalization LOS Costs ED visits Costs of ED DC or GMC patient	Accounting software EMR	601 (145 DC and 456 GMC)	Massachusetts	No significant differences found between types of care settings	Outpatient and Inpatient Healthcare Utilization
Maciejewski & Maynard, 2004	What are the total direct costs of IPS and outpatient care for DM patients in the VA from 1994-1998?	Cross-sectional cohort study	Utilization Costs	IPS and outpatient care Unit cost for outpatient was $112.54 and $11,524 for IPS	429,918 veterans with types 1 & 2	VA	LOS and number of discharges decreased while outpatient visits increased 12.8%; costs in 1998 were $1.67 billion total ($214 million outpatient and $1.45 billion IPS) equaling 3.9% of total expenses for the VA	Outpatient and Inpatient Healthcare Utilization
Wheeler, Crawford, McAdams, Benel, Dunbar, Caudle, George, El-Kebbi,	How is follow up happening among an urban adult population with DM?	Archival	Follow up care Financial class	Acute care (ED, urgent care), outpatient clinic (PC or specialist) or none	658/52% male/88% Black	Atlanta	69% had follow up in an outpatient clinic; 15% in an acute care setting; 16% no follow up; 52% had no insurance	Outpatient and Inpatient Healthcare Utilization Internal and

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
Gallina, Ziemer, & Cook, 2004			Health insurance					External Systemic Barriers to Care and Healthcare Utilization
Yu, Cowper, Berger, Kuebeler, Kubal, & Manheim, 2004	Does geographic location effect healthcare utilization and cost among Veterans with nine different diseases?	Archival	Geographic location Utilization Cost	22 VA clinics IPS and outpatient IPS, outpatient, prescription	Patients with one of 9 Quality Enhancement Research Initiative (QUERI) diseases from 1999-2000	VA databases	Utilization and cost differed by disease process and geographic location; costs for DM were similar to heart disease, psychiatric disorders, and substance abuse	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Ashton, Septimus, Petersen, Souchek, Menke, Collins, & Wray, 2003	What are the utilization rates among veterans with DM?	Retrospective cohort study	Utilization Co-morbid chronic diseases	IPS bed-day rates, PC and urgent care visits, tests and consults	33,481 Veterans in 1997 enrolled while IPS for the first time with DM/62.2% White;98.8% men	VA databases	60% had 1 or more co-morbid diseases (73.4% had HTN, 29.5% substance abuse disorder); 40% had at least 1 IPS stay for an average of 8 days; 6 PC and 16 test/consult visits	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
Jiang, Friedman, Stryer, & Andrews, 2003	Do the same patients with DM have multiple IPS stays? Do the rates differ by demographics?	Cross-sectional	Multiple hospitalizations	1999 HCUP	648.748/102,389 Black/74,425 Hispanic	California, Missouri, New York, Tennessee, Virginia	30% of patients had 2 or more IPS stays equaling 55% of total IPS stays and 54% of the total hospital costs in 1999; costs for multiple stays was 3 times as much compared to patients with 1 stay with more Hispanic and Black patients in this group; patients on Medicare/Medicaid and those living in lower economic zip code areas were also more likely to have multiple IPS stays	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Ansell, Schiff, Goldberg, Furomoto-Dawson, Dick, & Peterson, 2002 *(same sample as 1998 publication)*	Do DM patients, with a primary care provider, have fewer urgent visits and more scheduled visits?	Interview Survey	Utilization HbA1c Quality of care	IPS and outpatient visits Blood sample ADA recommended services	185/60.5% female/63.8% Black	Cook County Hospital	Only 38.5% of patients had a regular PC source (RPCS) and had more PC visits, fewer walk-in visits; those with a PC visit within 3 months of a walk-in visit also had more PC, fewer walk-in visits and	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							got more of the ADA services	Healthcare Utilization
Ciechanowski, Walker, Katon, & Russo, 2002	Are there differences in health seeking behavior and symptom perception among female patients?	Survey	Attachment Depression Physical symptoms Utilization and cost	RSQ-30, MHI-5 on SF-36 Diagnostic Interview Schedule	701 females/81% White	GHC, Seattle	Age, marital status, household income, ethnicity, and depression were all associated with style. Preoccupied (22%) were significantly more likely to be married than fearful (21%). Dismissing (23%) were older than fearful and preoccupied; less likely to be White compared to preoccupied. Preoccupied and fearful types reported significantly more somatic symptoms compared to secure (34%). Fearful, dismissing and secure all had significantly fewer PC visits compared with preoccupied. Fearful, dismissing and secure also had significantly lower	Attachment Style and Healthcare System Interactions Outpatient and Inpatient Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							costs than preoccupied.	
Westert, Lagoe, Keslimaki, Leyland, & Murphy, 2002	Do hospital readmission rates vary among the causes of hospitalization and the study populations? Are hospital IPS lengths of stay inversely related to readmissions rates?	Archival	Readmission	Readmission rates		3 European countries (Finland, Scotland, and Netherlands) and 3 states (NY, WA and CA)	COPD and CHF had highest readmit rates for both Europe and US. COPD and asthma patients who were readmitted had longer stays	Outpatient and Inpatient Healthcare Utilization
CDC Diabetes in Managed Care Work Group, 2001	How does a DM surveillance system used by managed care organizations (MCO) monitor complications and utilization rates?	Archival	Utilization Complications	IPS, outpatient visits, lab tests and procedures, and prescriptions Heart, eye, lower extremity or renal disease	16,363 DM patients; racial/ethnic data was not in the database so was not included in the analysis	Northwest, southwest and southeast U.S.	About 50% of patients had a cardiovascular complication; Positive correlation between more complications and more inpatient and emergent healthcare utilization, but only slightly higher outpatient use	Outpatient and Inpatient Healthcare Utilization
Ciechanowski, Katon, Russo, Walker, 2001	Do patients with type 1 and 2 DM with dismissing attachment style have lower adherence to treatment?	Cross-sectional	Attachment Patient-Provider Relationship Depression Complications Knowledge	RSQ-30/RQ-4 Patient Reactions Assessment SCL-90R Self-report DM Knowledge Assessment Scale-15,	367 (317 White)	2 Group Health Cooperative (GHC) PC clinics in Seattle	Dismissing style patients with poor patient-provider communication had significantly higher A1c values (1.01% higher), as well as	Attachment Style and Healthcare System Interactions Internal and

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
			Self-Care Comorbidity Non-adherence, PC utilization	Summary of DM Self-Care Activities Chronic disease score Pharmacy records GHC records			significantly less adherence to glucose monitoring and more interruptions in treatment (refill was overdue by more than 14 days)	External Systemic Barriers to Care and Healthcare Utilization
Chin, Zhang, & Merrell, 2000	Does type of provider impact health status, quality of care, and resource utilization among older diabetic Medicare patients?	Archival	Health perception Health status Quality Patient satisfaction Utilization Comorbidity Complications	1 item ADL/IADL 20 items Medicare reimbursement Charlson Comorbidity Index ICD-9 codes	1637 (62% female)		4% of patients who saw endo were younger, more educated and had more complications. 10% saw a general practitioner (GP) No differences in readmission and follow-up rates after discharge among type of provider. Patients of GPs were more satisfied when it came to systems issues. Endo had more admissions and ED visits compared to FP and GP and more outpatient appointments compared to GP.	Outpatient and Inpatient Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							With utilization as the DV, patients of endo and IM had greater total reimbursement and Part B reimbursement	
Chin, Zhang, & Merrell, 1998	Are AA patients with DM on Medicare at risk for poor health, lower quality care, and higher utilizers of care?	Medicare Current Beneficiary Survey	Quality of Care Utilization	Katz Index of Activity of Daily Living (ADL), Instrumental ADL, health perception, Charlson Comorbidity Index, DM complications HbA1c, ophthalmology visits, lipid testing, mammogram, flu vaccine, 30-day readmits, outpatient visit within 4 weeks of discharge Total Medicare reimbursement	1376 DM patients with Medicare in 1993	United States		Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Nelson, McHorney, Manning, Rogers, Zubkoff, Greenfield, Ware, & Tarlow, 1998	Are there differences in utilization between prepaid (PPD) and fee-for-service (FFS) insurance plans among older chronically ill patients?	Observational (Medical Outcomes Study 1986-1990)	Utilization Payment	IPS and outpatient visits PPD or FFS	1681/47.7% male/22.7% non-White	Boston, Chicago, Los Angeles	PPD patients were younger and in better health, more diverse and educated; 11.4% of PPD and 14.7% of FFS patients were hospitalized, while PPD averaged 4.55 outpatients visits and 4.30 for FFS;	Outpatient and Inpatient Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							differences may have more to do with disease severity and patient characteristics	
Schiff, Ansell, Goldberg, Dick, & Peterson, 1998 *(same sample as 2002 publication)*	Were six standards of diabetes care delivered?	Interview Survey	Regular source of care Use of health care HbA1c DM Care	Name of site IPS, ED, walk-in, outpatient Blood sample 6 standards	218/60.1% female/63.3% Black	Cook County Hospital	61% of patients with a regular source of care had more access and received more of the 6 DM care standards, A1c was lower for patients with insurance but was not significantly related to a source of care	Outpatient and Inpatient Healthcare Utilization Internal and External Systemic Barriers to Care and Healthcare Utilization
Koproski, Pretto, & Poretsky, 1997	Are RCTs feasible with hospitalized diabetes patients in order to examine the effect of a DM team on LOS, glucose control, and readmission rates?	RCT	LOS Glucose control	Days admitted Blood glucose	179	NYC teaching hospital	Differences between groups were not significant with average LOS for intervention of 5.5 and 7.5 days for control. “Good” glucose control during the first month of the program was 75% in the intervention and 46% in control group but as time went on	Outpatient and Inpatient Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							differences between groups diminished. 15% of intervention patients were readmitted within 3 months compared to 32% of control group (P<0.01)	
Weinberger, Oddone, & Henderson, 1996	Would better access to primary care reduce the rates of readmission for veterans?	RCT	QoL Satisfaction with care Utilization	SF-36 Patient Satisfaction Questionnaire Number of days in the hospital and readmits rates; time to first readmit; proportion of patients readmitted; number of ED visits and number of outpatient visits in 180 days	3209 (mostly male)/ mostly White	Multicenter, RCT with VA clinics	Intervention group was phoned a mean of 7.5 times for an average of 5.7 minutes per call; had significantly less time between discharge and first clinic visit; more often had at least 1 clinic visit during study; made 68% more visits to general medicine clinics and had 5% fewer specialty visits; higher readmission rates and more days in the hospital. Both groups had low QoL scores and intervention patients were	Outpatient and Inpatient Healthcare Utilization

Reference	Research Question	Study Design	Variables	Measure	Sample Size Race/Ethnicity	Setting	Results	Theme
							significantly more satisfied with their care	
Faich, Fishbein, & Ellis, 1983	Are there modifiable attributes of diabetic acidosis geography and patient characteristics	Chart review, interviews and discharge summaries	Admission rates		130,400 admissions to 15 hospitals with 9663 for primary and secondary for DM/2 Black subjects	15 hospitals in Rhode Island	152 diabetic acidosis, or 9% of admissions (1.6% of all admissions for DM). 20% of admissions were among “newly diagnosed”, 15% of “repeaters” (this term was not operationally defined), and 65% of admissions were among known diabetics single admission. Females had a rate of 1.5 times that of males	Outpatient and Inpatient Healthcare Utilization

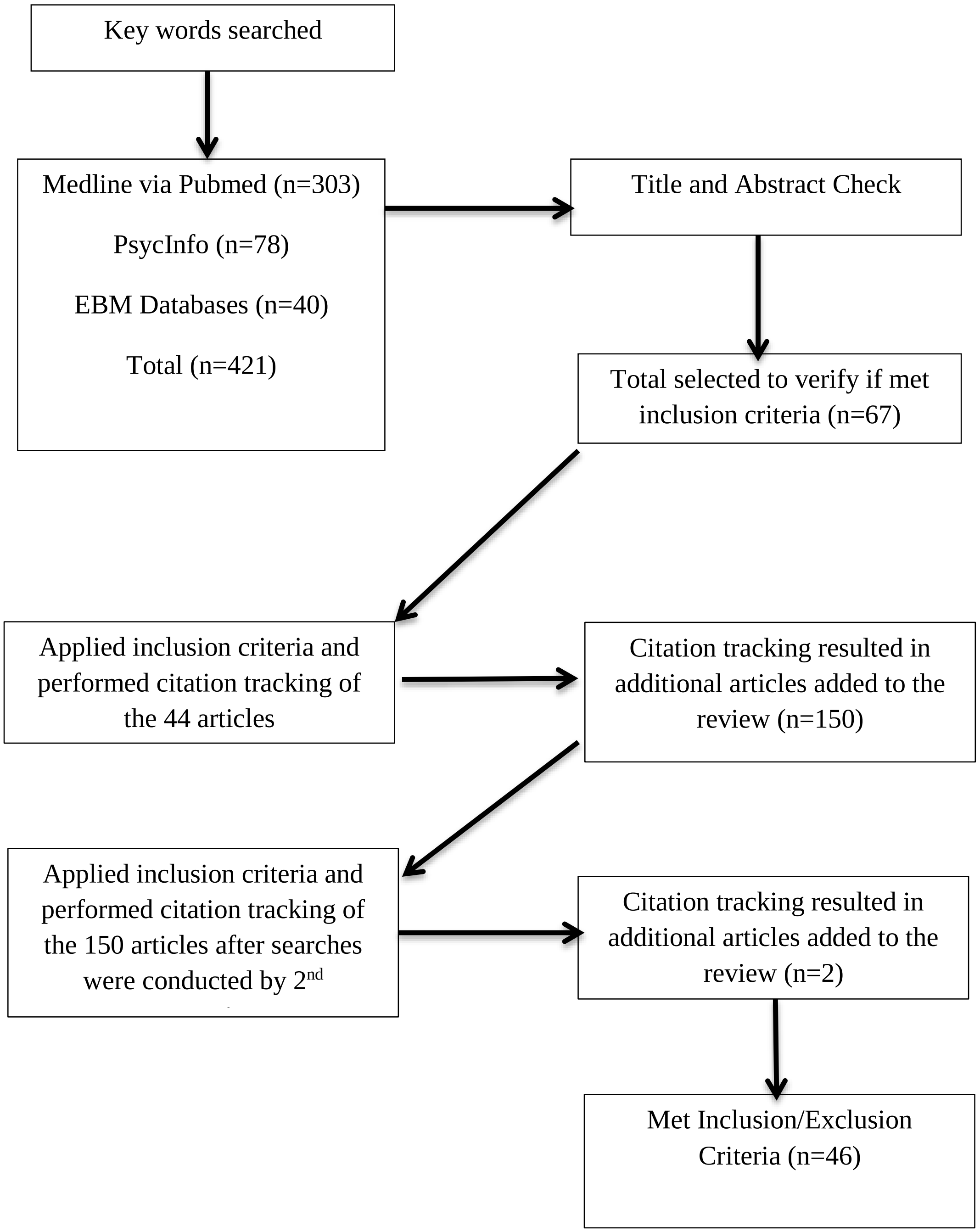

Figure 1. Systematic Literature Review Search Methodology

MODEL OF SELF
(Dependence)

	Positive (Low)	Negative (High)
Positive (Low)	CELL I SECURE Comfortable with Intimacy and autonomy	CELL II PREOCCUPIED Preoccupied with relationships
Negative (High)	CELL IV DISMISSING Dismissing of intimacy Counter-dependent	CELL III FEARFUL Fearful of intimacy Socially avoidant

Figure 2. Model of adult attachment. From “Attachment Styles Among Young Adults: A Test for a Four-Category Model,” by K. Bartholomew and L. M. Horowitz, 1991, *Journal of Personality and Social Psychology, 61*, p. 227. Copyright [1991] by American Psychological Association. Reprinted with permission.

		MODEL (VIEW) OF SELF	
		+	-
MODEL (VIEW) OF OTHER	+	SECURE ATTACHMENT (55% of general population; 44% of medical populations) Characterized as: • “trusting of others” • “feeling worthy of other’s • attention”	PREOCCUPIED ATTACHMENT (8-15% of general and medical populations) Characterized as: • “emotionally dependent on others” • having low self-esteem • demonstrating high symptoms reporting and high health care utilization
	-	DISMISSING ATTACHMENT (25% of general population; 36% of medical populations) Characterized as: • “compulsively self-reliant” • pervasive lack of trust of others • demonstrating lower health care collaboration and greater number of missed health visits	FEARFUL ATTACHMENT (5-10% of general population; 12-20% of medical populations) Characterized as: • “approach-avoidance behavior” • fearful of intimacy and rejection • pervasive lack of trust of others • demonstrating high symptom reporting and greater number of missed health visits

Figure 3. Attachment style categories and model of self and other. From “The Interpersonal Experience of Health Care Through the Eyes of Patients with Diabetes,” by P. Ciechanowski and W. J. Katon, 2006, *Social Science and Medicine, 63*, p. 3069. Copyright 2006 by Elsevier Limited. Reprinted with permission.

CHAPTER THREE: METHODOLOGY: ADULT ATTACHMENT THEORY AND DIABETES MELLITUS: HEALTHCARE UTILIZATION AND BIOPSYCHOSOCIAL HEALTH

The Patient Protection and Affordable Care Act (Section 10407 of Public Law 111-148) includes a section entitled “the Catalyst to Better Diabetes Care Act of 2009.” This section states that every other year the Centers for Disease Control and Prevention (CDC) will publish a report card on diabetes mellitus (DM) in the United States (CDC, 2012). The report card goes beyond incidence and prevalence by focusing upon preventive and quality care attributes. These are published as results of the National Diabetes Surveillance program. The attention and specificity point to the emergence of DM as a national health concern. Having preventive, diagnostic, and treatment guidelines are only useful when patients have access to the information and act upon it in their disease management protocol.

The method for this dissertation study (phase two) expanded upon the design of an existing study (phase one), which sought to enhance knowledge about primary care (PC) patients with DM in a rural southeastern region. This second phase of the study was a critical next step to furthering the research on the relationship between attachment styles, biopsychosocial (BPS) factors, and healthcare utilization rates among rural patients with DM by creating BPS patient summaries. The expanded study was necessary to address gaps in the literature on relational aspects of care and their impact on overall health and healthcare utilization, and was studied through the research question of the dissertation. The East Carolina University Institutional Review Board, which is the body who approves all research conducted at East Carolina University, and the Brody School of Medicine Privacy Office, which ensures that the electronic health system is accessed appropriately and patients’ rights and privacy are protected, have approved both study phases.

Design

The aim of this descriptive cross-sectional study was to explore associations among patient attachment style, outpatient and inpatient utilization, and HbA1c, taking into account: (a) depression; (b) DM related distress; (c) physical and mental health perceptions; (d) medication adherence; (e) patient empowerment; and (f) sources of social support among a sample of primary care patients with diabetes in a rural southeastern community. The research question guiding this study was: What are the psychosocial (depression, social support, DM empowerment, health perceptions & distress) and behavioral (medication adherence & healthcare utilization) patient summaries of adults with DM living in a rural geographic location by attachment style? The research hypotheses proposed for this study are as follows:

1. Previous DM and adult attachment research was conducted with a predominantly Caucasian, educated, insured, urban sample (Ciechanowski et al. 2010; Ciechanowski & Katon, 2006; Ciechanowski et al., 2004; Ciechanowski, Katon, & Russo, 2005; Ciechanowski, Russo, Katon, Von Korff, et al., 2006). With a mostly African American sample it was hypothesized that the grouping of patients by attachment style would differ by patient demographics (i.e., gender, age, type of insurance, and marital status).
2. As a means to build upon prior attachment studies with diabetic patients (Ciechanowski et al., 2010; Ciechanowski, Russo, Katon, Simon et al., 2006; Ciechanowski et al., 2004; Ciechanowski, Katon, Russo, Walker, 2001; Ciechanowski, Russo, Katon, Von Korff, et al., 2006; Ciechanowski, Walker, Katon & Russo, 2002), and further describe psychosocial characteristics it was hypothesized that securely attached patients with DM would be more likely to report: (a) higher levels of social support and DM empowerment; and (b) greater mental health well-being (less depression and distress, and better physical and mental health perceptions).

3. In contrast, it was hypothesized that patients with insecure attachment styles (preoccupied, fearful, and dismissing) would be more likely to report: (a) less social support and DM empowerment; and (b) lower mental health well-being (moderate to severe depression, more distress, and less healthy physical and mental health perceptions).
4. Lastly, the literature has shown patient barriers (i.e., depression) exist and hinder strict treatment adherence often resulting in more healthcare utilization among certain types of relationship styles (Ciechanowski, Russo, Katon, Simon, et al., 2006; Ciechanowski, Katon, & Russo, 2000; Ciechanowski et al., 2001; Egede, Zheng, & Simpson, 2002; Gibson et al., 2010; Hepke, Martus, & Share, 2004; Lin et al., 2004). To examine this issue it was hypothesized that among patients with certain combinations of attachment, psychosocial, and behavioral characteristics, total healthcare utilization rates and HbA1c values would be higher.

Setting

An outpatient academic PC center in rural eastern North Carolina served as the setting for this study. The center is affiliated with a large public university in the southeast and serves patients in a 29-county region. Patient services include urgent and PC services to patients from birth to later life, as well as minor surgical procedures, prenatal, sports medicine, nutrition, physical therapy, and behavioral medicine. An attached Geriatric Center provides outpatient care and consultative services to a growing population of elderly patients. Both centers use an electronic medical record system. Learners include health science and medical students, as well as primary care residents. Total annual patient volume including the center, a teaching nursing home, and two PC centers in nearby communities exceeds 85,000 encounters per year. The center provides access to patients of all races and ethnicities; 47% of patients are non-white minorities and health insurance is: Medicare/Medicaid 57%, private insurance 31%, and uninsured 12%. The academic department affiliated with the center has 42 full-time equivalent faculty members in eight different divisions in addition to mid-level clinical providers (nurse practitioners and physician assistants) and nurses.

Participants

Throughout each subsection of this chapter, two phases of the study are referenced. Phase one was focused on gaining knowledge about adult patients with DM who access their care in a rural PC setting. Phase two was designed to gather data on attachment style and DM related distress.

Phase One

Phase one researchers used a convenience sampling strategy to recruit a sample of 258 adult PC patients with DM, type II. Participants were recruited through a medical records review process or were referred by a primary care provider (PCP) at the study site. Participants who then met the following inclusion criteria were admitted into the study: (a) English speaking, (b) adults (≥18 years old), and (b) actively being treated for type II DM at one southeastern family medicine clinic. Exclusion criteria were: (a) diagnosed with gestational diabetes, (b) identified as having a serious and persistent mental health diagnosis (schizophrenia, bipolar disorder, and active psychosis), or (c) identified as having severely decreased cognitive capacity. The goal of phase one was to screen at least 250 adult patients with type II DM (an estimated 10% of the Center’s population of patients with diabetes) in anticipation of identifying an estimated 100 patients with co-morbid depressive symptoms. The prevalence of co-morbid depression was estimated and characterized by age, race, and sex relative to the entire population of diabetic patients in the clinic. Patients were given the opportunity to refuse participation or to discontinue participation at any time without jeopardizing their care delivery in the Center.

Phase Two

The 258 adult PC diabetic patients who consented to participate in phase one, were contacted for phase two. As with phase one, participants were given the opportunity to refuse participation in phase two or to discontinue participation in phase two at any time without jeopardizing their care delivery at the Center.

Procedures

Phase One Recruitment

Participants recruited for this study were 258 PC patients either referred by a provider or identified through a review of the electronic medical record. Patients were initially approached in the context of their visit with their regular provider and a brief description of the study was provided to them. If they expressed interest, the informed consent statement and HIPAA Authorization were reviewed with them. Upon receiving consent, data collection was initiated by research assistants who completed the Collaborative Institutional Training Initiative (CITI) IRB training modules. Demographic data was collected through a self-report survey. Additional study data was collected via depression, social support, empowerment, adherence, and quality of life questionnaires that are described below. Clinical biomarker data was also collected. This included Body Mass Index (BMI), HbA1c, and blood pressure (BP).

Those who consented to participate were actively screened for co-morbid depressive symptoms in a private examination room, before or after their routine care, using a standardized screening instrument (Patient Health Questionnaire-9 [PHQ-9]) (Kroenke, Spitzer, & Williams, 2001). Patients were not included in the studied if they endorsed suicidality. A cut off score of

≥10 was considered to be depressed. Associated measures of family support (Modified Dunst Family Support Scale [DFSS]; Dunst, Trivette, & Deal, 1988), diabetes related self-efficacy (Diabetes Empowerment Scale-Short Form [DES-SF]) (Anderson, Fitzgerald, Gruppen, Funnell, & Oh, 2003), medication adherence (Morisky Medication Adherence Scale [MMAS]) (Krousel-Wood et al., 2009) and physical and mental health perceptions (CDC Healthy Days Core Module [CDC HRQOL-4]) (CDC, 2000), were also completed. Screening questionnaires were administered via a password protected tablet computer using Qualtrics (Qualtrics, Provo, UT), a web-based data collection software program.

After the demographic questions the order of measurement administration was as follows: (a) PHQ-9 (Kroenke, Spitzer, & Williams, 2001); (b) Modified DFSS (Dunst, Trivette, & Deal, 1988); (c) DES-SF (Anderson, Fitzgerald, Gruppen, Funnell, & Oh, 2003); (d) MMAS (Krousel-Wood et al., 2009) and (e) HRQOL-4 (CDC, 2000). It took each phase one participant approximately 20 to 30 minutes to complete the entire assessment battery. The above mentioned questionnaires were intended to be administered up to four times per year (every 3 months) at routine clinic visits to specifically track disease status. Those participants with a PHQ-9 score ≥ 10 were considered to be experiencing moderate to severe depressive symptoms. When appropriate, the results of this screening were delivered to the provider following the screening so that any previously undiagnosed disease could be effectively evaluated, diagnosed, and treated by the provider. Patients consented to this as a part of the research protocol when they agreed to participate.

Phase Two Recruitment

Participant recruitment for the second phase of the study took place via mail, telephone, or in person during a scheduled clinic appointment. The focus for phase two was to collect data on participants' relationship styles, DM related distress ratings, and inpatient and outpatient (i.e. primary care, specialty and behavioral health visits) healthcare utilization. Research assistants who had completed the Collaborative Institutional Training Initiative (CITI) IRB training modules contacted the potential participants to let them know the phase one study had been revised and additional data was being collected. A cover letter and paper copies of the two additional questionnaires were included in the mailing for patients to complete and return in a self-addressed stamped envelope. In the cover letter participants were also extended the opportunity to complete the two questionnaires online via Qualtrics (Qualtrics, Provo, UT). The Relationship Questionnaire (RQ) (Bartholomew & Horowitz, 1991) is a four-item questionnaire used to determine one's relationship style. The Diabetes Distress Scale (DDS) (Polonsky et al., 2005) is a 17-item measure designed to assess level of distress related to diagnosis and management of diabetes. A second mailing was sent to all patients who had not responded approximately two months after the initial mailing. This dissertation study collected participant data at a single time point, with the potential for further studies to look at longitudinal changes across all study variables by attachment styles.

For the phase two mailing, patients who consented to participate in phase one were assigned a unique identification number, other than their medical record number (MRN). This was done to avoid using MRNs on the mailed questionnaires, and to provide a way for investigators to match responses. A separate key code spreadsheet was maintained by the lead investigator in a secure location separate from consent forms and surveys. The key code was saved on a secure password protected server. The key code was essential to the research and was used to link study identification numbers with MRNs so that two clinical data points (healthcare utilization in the previous year and most recent HbA1c) could be gathered after receipt of the questionnaires from phase two from the electronic health record (EHR). Signed consent forms, with privacy information embedded, were kept in a locked file cabinet in the PC center that is locked each day. Monthly, data was scanned and saved to a SPSS data file on a password protected computer in a locked office.

Data Collection

All data was collected through the US mail system, online survey access via Qualtrics (Qualtrics, Provo, UT), or in person via tablet when the participant arrived for a medical visit. The independent variables for the phase two study included demographic data, attachment style, DM distress, depression, medication adherence, patient empowerment, and social support. The primary dependent variable analyzed in this study was healthcare utilization, which included inpatient admissions and outpatient PC, specialty and behavioral health appointments. The secondary dependent variable was HbA1c.

Independent Variable Measures: Phase One

Demographic data elements were included as independent variables in phase one. Measures of depression, social support, self-efficacy in terms of DM empowerment, medication adherence, and quality of life perceptions were also included.

Demographic Information. Demographic data included information about gender, age, race/ethnicity, marital status, insurance status, number of years and months patient had been diagnosed with DM, and the pharmacy where prescription medications are filled. In addition the researcher collected clinical information to include number of PC, specialty and behavioral health scheduled visits, same-day outpatient visits and admissions to the local medical center.

Depression. Participants were asked to complete the PHQ-9 (Kroenke, Spitzer, & Williams, 2003). The 9-item questionnaire is used to assess for and monitor depressive symptoms and severity using the American Psychiatric Association DSM-IV-TR (2000) (criteria, which include: 1. anhedonia; 2. feeling depressed; 3. sleep trouble; 4. lack of energy; 5. appetite changes; 6. feeling bad or like a failure; 7. trouble concentrating; 8. speaking or moving slowly; and 9. suicidal thoughts. Although the newly published DSM-5 (2013) does provide additional information pertaining to the diagnosis of major depressive disorder, the diagnostic criteria did not change, so the assumption has been made that the PHQ-9 continues to be a valid screening tool for depression.

Response options to the nine items range from zero to three: not at all; several days; more than half the days; and nearly every day and are meant to be used in thinking back over the previous two weeks. High specificity of 0.94 indicated that the PHQ-9 is reliable in avoiding false positives, however it has been found to have low sensitivity (0.77), meaning some patients who are depressed may be missed (Wittkampf, Naeije, Schene, Huyser, & van Weert, 2007). Both the sensitivity (0.88) and specificity (0.88) have been found to increase when a cutoff score of ≥10 is used (Wittkampf et al., 2007). In a recently published meta-analysis, Manea, Gilbody, and McMillan (2012) found that cutoff scores ranging from 8 to 10 were also reliable in screening for depressive symptoms. It has been used with PC patient populations (Williams, Pignone, Ramirez, & Perez Stellato, 2002), as well as hospital and specialty care settings in the United States and around the world (Gilbody, Richards, Brealey, & Hewitt, 2007). In Wittkampf et al's, (2007) systematic review the sensitivity and specificity of the PHQ-9 with cutoff score ≥10 in hospitals ranged from 0.54 to 0.94 and 0.89 to 0.91 respectively.

Social Support. Social support data was collected using a modified version of the DFSS (Dunst et al., 1988). Originally the 18-item questionnaire was used to gather data about caring for a developmentally delayed child with support falling into one of six factors: 1) informal kinship; 2) social organizations; 3) formal kinship; 4) nuclear family; 5) specialized professional services; and 6) general professional services. Responses were gathered with the use of a 5-point Likert scale ranging from “Not at All Helpful” to “Extremely Helpful” with an additional option of “Not Available” (Hanley, Tasse, Aman, & Pace, 1998). The DFSS was modified to focus on DM care and rural populations (Littlewood, Lutes, & Cummings, 2013). The subjects were asked to consider who was helpful to them in managing their DM in the previous two months and listed parents, spouse/partner, friends, and professional agencies among others. Exploratory factor analysis and regression analysis, with a sample of AA females with DM, found an overall reliability of 0.90. Three factors resulted from further analysis: (a) Parent and Spouse/Partner Support subscale, (b) Community and Medical Support subscale, and (c) Extended Family & Friends Support subscale with similar Chronbach’s coefficients (0.86, 0.83, and 0.83, respectively).

Patient Empowerment. The DES-SF was developed to gather data on aspects of coping with diabetes and initiating DM management changes (Anderson, Fitzgerald, Funnell, & Marrero, 2000). The original questionnaire was 37-items, reduced to 28-items across eight dimensions of care (Anderson et al., 2003). The eight dimensions focused on: 1) determining if change is needed; 2) constructing a plan; 3) working through obstacles; 4) asking for help from others; 5) supporting oneself; 6) coping with feelings and emotions; 7) focusing on intrinsic motivation; and 8) choosing appropriate care based on goals for change. The 8-item short form was created with the one item from each of the eight domains with the highest correlation. The reliability of the short form has been reported as α=0.85 in the original dataset, and α=0.84 in a new study with a sample of 229 subjects. Content validity was supported as DES-SF scores went up and HbA1c scores went down and changed independently (Anderson et al., 2003). In a RCT study the DES-SF was used with urban AA patients with DM finding differences between the control and intervention groups, attributed to both groups improving based on involvement or knowledge of the program (Anderson et al., 2005).

Medication Adherence. The MMAS (Morisky, Green, & Levine, 1986) was originally used to study patient adherence with blood pressure medication. The MMAS (Morisky et al., 1986) was an 8-item scale with scores ranging from 0 to 8 with low adherence (<6), medium adherence (6 to <8), or high adherence (8), and has been found to have strong reliability (α=0.83) among hypertensive patients with a significantly higher number of black patients classified as low adherers to medication (Krousel-Wood et al., 2009). The modified 8-item scale has two response options (No=0; Yes=1) with a range of scores from 0 to 8. For each item lower scores represent more medication adherence, higher scores correlate to lower medication adherence and the instrument has been found to have strong reliability (α=0.83) among hypertensive patients with a significantly higher number of black patients classified as low adherers to medication (Krousel-Wood et al., 2009). In a 2009 study the MMAS was used with 151 mostly Latino or AA diabetic patients living in New York City. The vast majority (80%) reported being on Medicaid, and 25% had a HbA1c value >8.5% (Mann, Ponieman, Leventhal, & Halm, 2009).

Health Perceptions. Perceptions of physical and mental health were measured using the CDC HRQOL-4 (Moriarty, Zack, & Kabau, 2003), which was designed to gather data in regard to the previous 30-days. The questionnaire has been used as part of the Behavioral Risk Factor Surveillance System (BRFSS) survey, which is widely used across the United States (Zahran et al., 2005). Patients are asked to report the number of unhealthy days they have experienced both physically and mentally in the past 30 days. For comparison purposes a cut point of 14 or more days has been considered to be at a distress level. The HRQOL-4 has been used to gather data among white, black, Hispanic, Asian, and American Indian or Alaska Native populations (Chowdhury, Balluz, & Strine, 2008). Compared to the Medical Outcomes Study Short Form 36 (SF-36) shorter quality of life instruments, including the HRQOL-4, have been found to have good psychometric properties (Chowdhury et al., 2008). Among adults in the United States it has shown good construct validity (CDC, 2000), and criterion validity among those with chronic conditions and comorbid depression (Newschaffer, 1998).

Independent Variable Measures: Phase Two

In phase two of the research study relationship style and distress were additional independent variables. The RQ (Bartholomew & Horowitz, 1991) was used to assess relationship style and patients reported their DM related distress with the DDS.

Attachment Style. This 4-item RQ (Bartholomew & Horowitz, 1991) was administered to patients so that they could be categorized into one of four attachment styles or categories: secure, dismissing, fearful, or preoccupied. Participants read four short paragraphs and selected their response from a 7-point Likert-type scale ranging from disagree strongly to agree strongly. Each paragraph was representative of one of the four attachment styles. For example, the securely attached item read as follows: “It is relatively easy for me to become emotionally close to others. I am comfortable depending on others and having others depend on me. I don’t worry about being alone or having others not accept me.”(Bartholomew & Horowitz, 1991). Dimensions of self and others represent dependence and avoidance respectively (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010).

No adult attachment inventories were designed for the intended use in clinical settings to measure psychosomatic attributes. The RQ has been classified as having a very short subject and scoring time. The scores produce both categories and dimensions with adequate test-retest reliability (Ravitz et al., 2010). Scharfe and Bartholomew (1994) found high reliability and stability (r’s ranging from .72 to .96) among a sample of young adults in romantic relationships. In a large cross-cultural study with more than 17,000 subjects Schmitt et al., (2004) found that in 80% of the cultures the two dimensions of attachment (model of self and the model of others) were not correlated demonstrating that the dimensions are independent of one another, and in 79% of included cultures secure was the highest rated style.

Diabetes Related Distress. DM related distress was assessed with the DDS (Polonsky et al., 2005). This measure was developed to explore what aspects of diabetes management and care are most troublesome for patients. The items on the DDS are comprised on four subscales: emotional burden (EB=0.88); physician-related distress (PD=0.88); regimen-related distress (RD=0.90); and diabetes-related interpersonal distress (ID=0.88). An example item on the emotional burden subscale reads “Feeling overwhelmed by the demands of living with diabetes.” Patients responded on a 6-point Likert type scale ranging from “Not a Problem” to “A Very Serious Problem.” Internal consistency has been found to be strong for the overall scale (Cronbach α=0.93) and the four subscales in four different settings: PC clinics, diabetes specialty clinics, DM management program, and an ongoing DM management program (Polonsky et al., 2005). The response options for the 17-items are on a 6-point Likert-type scale ranging from no distress to serious distress over the past month (Fisher, Glasgow, Mullan, Skaff & Polonsky, 2008).

Dependent Variable Measures: Phase Two

The primary dependent variables in phase two were outpatient and inpatient healthcare utilization. HbA1c value (%) was the secondary.

Primary Dependent Variable: Healthcare Utilization. Scheduled and same-day PC, specialty and behavioral health visits, and inpatient admissions were abstracted via chart review or through a report by health information systems personnel to determine overall healthcare system utilization. Utilization data was analyzed to determine if incidence patterns exist with certain attachment styles. Utilization data was collected beginning one year prior to the phase two data collection time point. Participant enrollment continued through April 2014.

Secondary Dependent Variable: HbA1c. The most recent HbA1c values were abstracted via chart review. Inpatient healthcare utilization data was also gathered for those patients who participated in phase two.

Statistical Analysis

Data analysis was performed using SPSS, version 22, to answer the research question and address each of the hypotheses. The data analysis included an examination of depression, social support, empowerment, medication adherence, perceived health data, distress, healthcare utilization rates, and HbA1c by attachment style. First, univariate descriptive statistics were calculated to examine the mean and standard deviation for all demographic information (e.g., gender, race, age, marital status, and insurance status), psychosocial data (e.g., depression, social support, empowerment, health perception, and distress), behavioral data (medication adherence and healthcare utilization data) as well as relationship style (e.g., secure, fearful, preoccupied, or dismissing). Bivariate analyses (e.g., ANOVA and chi-square tests) were then conducted to further examine demographic, psychosocial, behavioral data, and attachment style to explore the relationships between and among variables. The healthcare utilization data was also visually summarized with histograms as a means to determine the appropriate modeling tests.

In order to test each hypothesis a combination of chi-square, ANOVA, and regression analyses were completed. In the first hypothesis it was put forth that patient demographic and attachment style subgroups would be depicted differently than in prior research studies. Patient summaries allowed for a better understanding of the rural, PC diabetic patient sample in this study. This served to build upon previously published literature on attachment by providing a comprehensive demographic summary of the rural patients in the sample and their relationship style.

To address the second and third hypotheses psychosocial (social support and empowerment), and mental well-being questionnaires (depression, distress, and mental and physical health perceptions) were explored by patient demographics and then attachment style. Chi-square analyses were conducted on the categorical data to compare proportions between groups, and ANOVA tests were performed on the quantitative data to closely examine for associations among the variables by comparing means (Kestenbaum, 2009). Chi-square is a less appropriate test with low cell counts or frequencies, however it would only be an issue in the case of statistical significant associations. The second hypothesis stated that those patients with a secure attachment would have higher levels of social support and empowerment along with less depression and distress, as well as better mental and physical health perceptions. The opposite was hypothesized for the less secure attachment styles (preoccupied, fearful, and dismissing). It was thought the insecurely attached patients would report less social support and empowerment, along with higher levels of depression and distress, and less healthy mental and physical health perceptions.

The fourth hypothesis was designed to examine whether patients with certain combinations of psychosocial, behavioral, and attachment profiles demonstrated more healthcare utilization and had higher HbA1c values. Regressions were used to better understand the relationships between the independent variable, attachment styles, with the primary dependent variable healthcare utilization, and the secondary dependent variable, HbA1c.

Multiple regression is applicable to health data because of the ability to explore relationships among one continuous variable and several dichotomous or continuous variables with the purpose of putting together the best combination of variables to predict the outcome variable. It is based on the assumption of cause and effect (Walker & Almond, 2010). Multiple regression analysis was used to explore HbA1c values by using an ordinary least squares framework, which is an estimate that reduces the sum of the squared vertical differences of the data points to the line in a scatterplot of data (Vittenhoff, Shiboski, Glidden, & McCulluch, 2005). Generalized linear models are useful in exploring medical or health related data, particularly in terms of utilization, because they are poised to handle categorical and continuous data elements. The critical element is the relationship of the mean and variance.

Count regressions models are used for count data because they are designed to manage the distribution of the data, most often with the Poisson distribution. The Poisson distribution requires the mean and variance to be the same, however, the Poisson regression often is inappropriate because of the variability of the data. A method of dealing with this would be to make the assumption that the mean and variance are proportional to each other (i.e., scale parameter) rather than equal. The data is referred to as overdispersed when the scale parameter is greater than one, or when the variance is larger than assumed for in the distribution. In this case a negative binomial regression (i.e., variance is modeled as a quadratic function of the mean) would be the most appropriate statistical modeling framework (Vittenhoff et al., 2005). When fitting a model to data one must take into account the following questions:

1. What is the distribution of the data (for a fixed pattern of covariates)?
2. What function will be used to link the mean of the data to the predictors?
3. Which predictors should be included in the model? (Vittenhoff et al., 2005, p. 298).

For this study sample one would expect a small number of patients to be high utilizers of outpatient and inpatient care. To explore outpatient (primary care, specialty care, behavioral health) and inpatient healthcare utilization rates negative binomial regression was used as a means of adjusting for the overdisperson of the data (Hilbe, 2011). To explore the relationships between the psychosocial and behavioral data, as well as secure and insecure attachment styles with HbA1c standard multiple regression was selected. Multiple regressions have often been used to explore health data because of their ability to highlight, or model relationships between some type of variable (HbA1c) and the associated variables (Gerstman, 2008; Munro, 2005).

According to Shmueli (2010), one needs to be aware of the distinction between explaining and predicting. The goal for this study is not to predict, but rather the exploration of many factors or covariates and the significant impact on each response. The result of this would likely be an overfit model, however it provides the opportunity to explore those elements which may be key and compare them across models. The model comparisons were all done with Type III analysis. Basically this tests for the contribution of each factor after including all other selected variables in the model. Significances in type III analyses dictate which predictors have a statistically significant impact on outcome variables after adjusting for other model variables. In other words, if a variable is significant it means it is helping to predict the independent variable, but if no significance is found it may be due to the number of variables included. Removing one may make the others significant (Habing, 2003). Like the chi-square or ANOVA, the type III analysis provides a general overview of some type of association, but no specifics.

Summary

The aim of this research was to explore BPS data, attachment style, and healthcare utilization among a rural sample of primary care patients with DM. A strong body of research not only provided a foundation, but served as an incentive to further explore DM with the theoretical framework of attachment. Contributions to the literature exist from predominantly Caucasian patients, but more was needed to be learned from a rural African American sample.

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CHAPTER FOUR: DIABETES MELLITUS AND ADULT ATTACHMENT THEORY: RELATIONAL ASPECTS OF CARE AND HEALTHCARE UTILIZATION

The International Diabetes Federation (IDF, 2013) reported 382 million people have diabetes mellitus (DM) worldwide, with an anticipated increase to 592 million by 2035. Tragically the IDF has also reported in the year 2013 that in spite of spending an estimated $548 billion on diabetic health care, over five million individuals died as a result of this disease, some unaware they even had it. According to the Centers for Disease Control and Prevention (CDC), in the United States there are 18.8 million individuals diagnosed with DM, while an estimated seven million remain undiagnosed (CDC, 2011). In 2012, the direct medical expenses for DM care across the United States was $306 billion, with approximately 75% of the costs related to inpatient, long-term care facility, hospice, and prescription care (American Diabetes Association [ADA], 2013).The aforementioned statistics reflect that in spite of international and national evidence-based guidelines and increasing awareness, DM presents an ever-growing demand on the healthcare system (Kirk et al., 2011; Paulweber et al., 2010).

A fragmented U.S. healthcare system lacking adequate care coordination (Institute of Medicine [IOM], 2012), in conjunction with a significant epidemic of diabetes, fosters a multitude of challenges at the highest legislative levels all the way to the individual patient level creating a complex and chaotic healthcare system. Healthcare reformers response to this has been to advocate for making quality, well-coordinated primary care (PC) services a priority in the United States (Eidus, Pace, & Staton, 2012; IOM, 2013). To complicate the care delivery and receipt process for patients with DM, researchers have found medical costs and access to care are often barriers to patients regularly following up with their outpatient providers and adhering to a medication regimen (Gibson et al., 2010).

An important relational dynamic in regard to self-care and disease progression is the influential role of the providers' knowledge on patients and the communication between them. In a thorough review of patient and provider aspects of care related to DM management, Nam, Chesla, Stotts, Kroon, and Janson (2011) highlighted the significance of attending to how and what providers communicate to patients, as well as solutions to patient and healthcare system related barriers (e.g., provider time constraints for patient visits or limited follow-up appointment slots). With regard to communication challenges, researchers uncovered that if a providers' attitude is more serious at the time of diagnosis, the patient better understands the seriousness of the chronic disease state which then influences self-care behaviors (Nam et al., 2011). Therefore, there is something in the patient-provider relationship dynamic that can be transformative, particularly at the time of diagnosis when patient distress is high.

DM related distress (Fisher, Glasgow, Mullan, et al., 2010) has also been studied to better understand the aspects of care patients struggle with most. Associated with emotional stress and distinct from major depressive disorder and depressive symptoms, Fisher, Glasgow, Mullan, Skaff and Polonsky (2008) defined distress as "patient concerns about disease management, support, emotional burden, and access to care," (p. 246). Polonsky et al. (2005) uncovered that the more distressed or overwhelmed patients feel in managing their DM, the more "diabetes-related conflict with loved ones may develop, and relationships with health care providers may become strained" (p. 626). When they examined DM related distress using the Diabetes Distress Scale (DDS), Polonksy et al., (2005) found higher scores were related to younger age groups, those taking insulin, and those demonstrating less self-care behaviors (i.e., exercise and glucose monitoring). Fisher, Glasgow, and Strycker (2010) also reported higher HbA1c percentages among those with higher DM related distress. What Baek, Tanenbaum, and Gonzalez (2014) found to be a protective factor, and particularly helpful among chronic disease patients in reducing emotional burden and interpersonal distress (two of the four subscales included in the DDS), was social support.

In further examining adherence and DM management strategies among patients and families, Mayberry and Osborn (2012) found a lack of social or family support decreased medication adherence and reduced attempts to initiate and continue healthy lifestyle modifications (e.g., diet). Managing stress or advocating for behavior change often occurs through a variety of coping mechanisms such as a sense of belonging; learning health related behaviors from others; or having a sense of empowerment from others in similar situations (Thoits, 2011). Stressful times have been shown to be accompanied by anxiety, depression, and distress, which can be positively influenced through social support from those closest to us or those with whom we work or attend church with. A caveat to the positive health outcomes associated with social support lies in the capacity of individuals to accept love, support, and encouragement from others (Thoits, 2011). Some may feel vulnerable or find it threatening to lean on others for support, or simply have difficulty forming safe and secure relationships.

Theoretical Orientation

To better understand the behavioral and relational aspects in conjunction with the physiological progression, significant contributions have been made to the DM literature utilizing attachment theory as a framework. Attachment theory aids in the exploration of the role relationship styles play in a patient’s ability to trust and connect with their outpatient healthcare providers, and support systems to foster change in health (Ciechanowski et al., 2001; Ciechanowski, Katon & Russo, 2005; Ciechanowski et al., 2004; Ciechanowski, Russo, Katon, Von Korff, et al., 2006). Based on John Bowlby’s original work with children and caregivers

(Bowlby, 1969, 1973, 1980), attachment theory focuses upon behaviors engaged in by individuals to establish and maintain relationships, initially to increase chances of survival by maintaining proximity to protective individuals (Ainsworth, 1989; Hazan & Shaver, 1994). Combined with the work of Engel (1977, 1980) who advocated for a biopsychosocial approach to health care, there is a push toward identifying the biopsychosocial profiles of patients who are being seen in our healthcare system to better tailor care to their individual needs.

Attachment theory has been applied to help understand relational obstacles or strengths with co-morbidly depressed diabetic patients, examining those who more successfully manage their DM from those who do not (Ciechanowski et al., 2005; Ciechanowski, Russo, Katon, & Von Korff, et al., 2006; Ciechanowski et al., 2004). The four styles of attachment that have been most often studied in the literature with DM patients include the secure, fearful, preoccupied, and dismissing types. The most widely used and psychometrically sound measurement to identify them is the Relationship Questionnaire (Bartholomew & Horowitz, 1991). When Ciechanowski and Katon (2006) studied adult attachment styles among patients with DM they found: (a) secure patients had a strong trust in their providers and often the health care system; (b) dismissing patients reported a heightened awareness of being controlled; and (c) fearful patients were consumed with worry about rejection or abandonment to the point that they remained with a provider to avoid having to establish a new relationship. They found both dismissing and fearful types endorsed having less social support, experienced more traumatic events early in life, and reported less satisfaction with providers and the healthcare system (Ciechanowski, Katon, Russo, & Walker, 2001; Ciechanowski, Russo, Katon, Von Korff, et al., 2006). However, according to Ciechanowski and Katon (2006), secure patients appeared to have an intrinsic ability to connect with and trust others, negating the barriers that could interrupt or detract from a positive patient-provider relationship.

In addition to better understanding the challenging psychosocial (Ciechanowski, Russo, Katon, Simon, et al., 2006) and self-management aspects of DM (Ciechanowski et al., 2004), researchers used adult attachment theory (Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987) to explore the influence of self-management decisions and patient-provider relationships on health and healthcare utilization (Feeney, 2000; Feeney & Ryan, 1994; Holwerda et al., 2013). According to Feeney and Ryan (1994), when studying healthcare utilization across the lifespan, those with insecure types of attachment (i.e., fearful) accessed the healthcare system more while avoidant (i.e., dismissing) types accessed it less. More recently this has also been found to be true by Ciechanowski et al. (2002) and Ciechanowski, Russo, Katon, Simon, et al. (2006).

In several studies where researchers focused on health and health care, those who exhibited preoccupied and fearful attachment styles were found to access the healthcare system more, as well as report, and be seen for somatic symptoms (Bartholomew, 1993; Ciechanowski, Sullivan, Jensen, Romano & Summers, 2003; Feeney & Ryan, 1994; McGrady, Lynch, Nagel, & Zsembik, 1999). Across all four attachment styles, those with a fearful style had the least number of PC visits, displaying avoidant behavior and not maintaining continuity with a provider. This type of behavior could be attributed to not wanting to establish or maintain a close relationship; however, this lack of continuity leads to fragmented care and the increased utilization of emergent services in the emergency room or an urgent care practice (Ciechanowski et al., 2003). Preoccupied style patients utilized the health care system most because of their positive views of others and their need for reassurance (Ciechanowski et al., 2003).

In a very large international study with over 17,000 participants across sixty-two cultures, Schmitt et al. (2004) concluded that most individuals are securely attached, although lower rates of secure attachment styles were found in geographic locations with fewer resources and more stress, common to rural underserved areas. The application of attachment theory to outpatient chronic disease management has provided a framework for examination of relationship style, treatment outcomes, and healthcare utilization rates; yet it has not been done so to a sufficient level with the populations most in need: those attempting to survive in rural, underserved geographical locations with limited educational, financial, and transportation resources.

Much of what is known about attachment styles and DM is based on research inclusive of participants who are predominantly White, educated (defined as at least one year of college), and insured (Ciechanowski et al., 2004; Ciechanowski et al., 2002; Ciechanowski et al., 2010; Ciechanowski, Russo, Katon, Von Korff, et al., 2006; Ciechanowski et al., 2001; Ciechanowski, Russo, Katon, & Simon, et al., 2006). Because rural populations do not often resemble this demographic composition (Smith, Humphreys, & Wilson, 2008), additional studies are needed with rural, ethnically diverse patient populations across the United States, and with individuals from varied educational levels and abilities to access to affordable healthcare.

Overall the literature reveals that without supportive relationships with family, friends, and the medical community patients are left to coordinate and manage their chronic disease alone, while navigating a fragmented and complicated healthcare system designed largely for the securely attached patient. While the majority of researchers have studied barriers to care, specifically economic and psychosocial stressors among White privileged populations, few have looked into how relationship styles among rural, lower socioeconomic (SES), and minority-group patient populations may be influencing their biopsychosocial outcomes and utilization of healthcare services. The aim of this descriptive cross-sectional study was to explore associations among patient attachment style, outpatient and inpatient utilization, and HbA1c taking into account: (a) depression; (b) DM related distress; (c) physical and mental health perceptions; (d) medication adherence; (e) patient empowerment; and (f) sources of social support among a sample of PC patients with DM in a rural southeastern community. The research question guiding this study was: What are the psychosocial (depression, social support, DM empowerment, health perceptions and distress) and behavioral (medication adherence and healthcare utilization) patient summaries of adults with DM living in a rural geographic location by attachment style?

Research Hypotheses

Hypothesis One

Previous DM and adult attachment research was conducted with a predominantly Caucasian, educated, insured, urban sample (Ciechanowski et al. 2010; Ciechanowski & Katon, 2006; Ciechanowski et al., 2004; Ciechanowski et al., 2005; Ciechanowski, Russo, Katon, Von Korff, et al., 2006). With a mostly African American sample it was hypothesized that the grouping of patients by attachment style would differ by patient demographics (i.e., gender, age, type of insurance, and marital status).

Hypothesis Two

As a means to build upon prior attachment studies with diabetic patients (Ciechanowski et al., 2004; Ciechanowski et al., 2002; Ciechanowski et al., 2010; Ciechanowski, Russo, Katon, Von Korff, et al., 2006; Ciechanowski et al., 2001; Ciechanowski, Russo, Katon, Simon et al., 2006), and further describe psychosocial characteristics it was hypothesized that securely attached patients with DM would be more likely to report: (a) higher levels of social support and

DM empowerment; and (b) greater mental health well-being (less depression and distress, and better physical and mental health perceptions).

Hypothesis Three

In contrast, it was hypothesized that patients with insecure attachment styles (preoccupied, fearful, and dismissing) would be more likely to report: (a) less social support and DM empowerment; and (b) lower mental health well-being (moderate to severe depression, more distress, and less healthy physical and mental health perceptions).

Hypothesis Four

Lastly, the literature has shown patient barriers (i.e., depression) exist and hinder strict treatment adherence often resulting in more healthcare utilization among certain types of relationship styles (Ciechanowski, Katon, & Russo, 2000; Ciechanowski et al., 2001; Ciechanowski, Russo, Katon, Simon, et al., 2006; Egede, Zheng, & Simpson, 2002; Gibson et al., 2010; Hepke, Martus, & Share, 2004; Lin et al., 2004). To examine this issue it was hypothesized that among patients with certain combinations of attachment, psychosocial and behavioral characteristics, total healthcare utilization rates and HbA1c values would be higher.

Method

The study was completed in two phases. Phase one focused on collecting self-report data on depression, social support, patient empowerment, health perception, and medication adherence, from adult patients with DM who access their care in a rural PC setting. The second phase focused on gathering attachment style, DM related distress, and outpatient and inpatient healthcare utilization data to further investigate the influence of relationship styles and DM distress on healthcare utilization rates from the same population used in phase one. The Institutional Review Board, which is the body who approves all research conducted at the institution, and the institution’s Privacy Office, which ensures that the electronic health system is accessed appropriately and patients’ rights and privacy are protected, approved both study phases.

Participants Phase One

Phase one researchers used a two-pronged convenience sampling strategy to recruit a sample of 258 adult PC patients with DM, type II. Participants were identified through: (a) a medical records review process or (b) a PC provider referral at the study site. Inclusion criteria for participants were: (a) English speaking, (b) adults (≥18 years old), and (b) actively being treated for type II DM. Exclusion criteria were: (a) diagnosed with gestational diabetes, (b) identified as having a serious and persistent mental health diagnosis (schizophrenia, bipolar disorder, and active psychosis), or (c) identified as having severely decreased cognitive capacity.

Participants Phase Two

The same 258 adult PC diabetic patients were contacted for phase two to gather additional data on attachment and DM distress. Data was collected in either one of two ways: through mailings or during scheduled clinic visits. A total of 148 patients completed the second phase of data collection, yielding a 57% response rate.

Procedures Phase One

Patients were initially approached by research assistants in the context of their visit with their regular provider and a brief description of the study was provided to them. The informed consent statement and HIPAA Authorization were reviewed with them verbally. Upon receiving consent, data collection was initiated. Data was collected via a password protected electronic tablet. It took each phase one participant approximately 20 to 30 minutes to complete the entire assessment battery.

Procedures Phase Two

Participant recruitment for the second phase of the study took place via mail, telephone, or in person during a scheduled clinic appointment. Research assistants gathered this data in person during patient visits or entered patient responses into Qualtrics from mailed in surveys.

Independent Variable Measures: Phase One

The independent variables in phase one included instruments to measure psychosocial and behavioral aspects of care. These included depression, social support, patient empowerment, health perceptions, and medication adherence.

Depression. Participants were asked to complete the Patient Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer, & Williams, 2003) to assess for depressive symptoms and severity. It has been used with PC patient populations (Williams, Pignone, Ramirez, & Perez Stellato, 2002), as well as with hospital and specialty care settings in the United States and around the world (Gilbody, Richards, Brealey & Hewitt, 2007). In Wittkampf, Naeije, Schene, Huyser, & van Weert's (2007) systematic review the sensitivity and specificity of the PHQ-9 with cutoff score ≥10 in hospitals ranged from 0.54 to 0.94 and 0.89 to 0.91 respectively.

Social Support. Social support data was collected using a modified version of the Dunst Family Support Scale (DFSS) (Dunst, Trivette, & Deal, 1988). The DFSS was modified to focus on DM care and rural populations (Littlewood, Lutes, & Cummings, 2013). The subjects were asked to consider who was helpful to them in managing their DM in the previous two months and listed parents, spouse/partner, friends, and professional agencies among others. Exploratory factor analysis and regression analysis, with a sample of AA females with DM, found an overall reliability of 0.90. Three factors resulted from further analysis: (a) Parent and Spouse/Partner Support subscale, (b) Community and Medical Support subscale, and (c) Extended Family &

Friends Support subscale with similar Chronbach’s coefficients (0.86, 0.83, and 0.83, respectively).

Patient Empowerment. The Diabetes Empowerment Scale-Short Form (DES-SF) was developed to gather data on aspects of coping with diabetes and initiating DM management changes (Anderson, Fitzgerald, Funnell, & Marrero, 2000). Eight dimensions focused on: 1) determining if change is needed; 2) constructing a plan; 3) working through obstacles; 4) asking for help from others; 5) supporting oneself; 6) coping with feelings and emotions; 7) focusing on intrinsic motivation; and 8) choosing appropriate care based on goals for change. The reliability of the short form has been reported as α=0.85 in the original dataset, and α=0.84 in a new study with a sample of 229 subjects. Content validity was supported as DES-SF scores went up and HbA1c values went down and changed independently (Anderson, Fitzgerald, Gruppen, Funnell, & Oh, 2003).

Medication Adherence. The Morisky Medication Adherence Scale (MMAS) (Morisky, Green, & Levine, 1986) was an 8-item scale with scores ranging from 0 to 8 with low adherence (<6), medium adherence (6 to <8), or high adherence (8), and has been found to have strong reliability (α=0.83) among hypertensive patients with a significantly higher number of black patients classified as low adherers to medication (Krousel-Wood et al., 2009). The modified 8-item scale has two response options (No=0; Yes=1) with a range of scores from 0 to 8. For each item lower scores represent more medication adherence, higher scores correlate to lower medication adherence, and the instrument has been found to have strong reliability (α=0.83) among hypertensive patients with a significantly higher number of black patients classified as low adherers to medication (Krousel-Wood et al., 2009).

Health Perceptions. Quality of life perceptions were measured using the CDC Healthy Days Core Module (CDC HRQOL-4) (Moriarty, Zack & Kabau, 2003), which was designed to gather data on both physical and mental health in the previous 30-days. Patients were asked to report the number of unhealthy days they have experienced both physically and mentally in the past 30 days. The HRQOL-4 has been used to gather data among White, Black, Hispanic, Asian, and American Indian or Alaska Native populations (Chowdhury, Balluz, & Strine, 2008). Among adults in the U.S., it has shown good construct validity (CDC, 1998), and criterion validity among those with chronic conditions and comorbid depression (Newschaffer, 1998).

Independent Variable Measures: Phase Two

Two explore relationship style and DM related distress two additional data points were collected in phase two. The independent variables studied in phase two include attachment style and DM distress.

Attachment Style. The 4-item Relationship Questionnaire (RQ) (Bartholomew & Horowitz, 1991) was administered to patients so that they could be categorized into one of four attachment styles or categories: secure, dismissing, fearful, or preoccupied. Participants read four short paragraphs and selected their response from a 7-point Likert-type scale ranging from disagree strongly to agree strongly. Each paragraph was representative of one of the four attachment styles. For example, the securely attached item reads as follows: “It is relatively easy for me to become emotionally close to others. I am comfortable depending on others and having others depend on me. I don’t worry about being alone or having others not accept me.” (Bartholomew & Horowitz, 1991). Dimensions of self and others represented dependence and avoidance respectively (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010).

No adult attachment inventories were designed for the intended use in clinical settings to measure psychosomatic attributes. The RQ has been classified as having a very short subject and scoring time. The scores produce both categories and dimensions with adequate test-retest reliability (Ravitz et al., 2010). Scharfe and Bartholomew (1994) found high reliability and stability (r's ranging from .72 to .96) among a sample of young adults in romantic relationships. In a large cross-cultural study with more than 17,000 subjects Schmitt et al. (2004) found that in 80% of the cultures the two dimensions of attachment (model of self and the model of others) were not correlated demonstrating that the dimensions are independent of one another, and in 79% of included cultures secure was the highest rated style.

Diabetes Related Distress. DM related distress was assessed with the Diabetes Distress Scale-17 (DDS-17) (Polonsky et al., 2005). The measure was developed to explore what aspects of DM management and care are most troublesome for patients and the items on the DDS are comprised of four subscales (Polonsky et al., 2005): emotional burden (EB=0.88); physician-related distress (PD=0.88); regimen-related distress (RD=0.90); and diabetes-related interpersonal distress (ID=0.88). An example item on the emotional burden subscale reads "Feeling overwhelmed by the demands of living with diabetes." Patients will respond on a 6-point Likert type scale ranging from "Not a Problem" to "A Very Serious Problem." Internal consistency has been found to be strong for the overall scale (Cronbach α=0.93) and the four subscales in four different settings: PC clinics, diabetes specialty clinics, diabetes management program, and an ongoing diabetes management program (Polonsky et al., 2005). The response options for the 17-items were on a 6-point Likert-type scale ranging from no distress to serious distress over the past month (Fisher et al., 2008).

Dependent Variable Measures: Phase Two

Healthcare utilization and HbA1c values were the two dependent variables in phase two of the study. Primary, specialty, and behavioral health care utilization were examined.

Primary Dependent Variable: Healthcare Utilization. Scheduled and same-day PC visits, specialty outpatient visits, and inpatient admissions were abstracted from the EHR via report or chart abstraction to determine overall healthcare system utilization. Utilization data was analyzed to determine if incidence patterns exist with certain attachment styles. Utilization data was collected for one year based on the beginning of the phase one study.

Secondary Dependent Variable: HbA1c. Participants' most recent HbA1c were included in a report from the EHR along with their corresponding outpatient healthcare utilization data. In the case of missing data HbA1c values were abstracted from the chart.

Results

Data analysis was performed using SPSS, version 22, to answer the research question and address each of the hypotheses. The data analysis included an examination of depression, social support, empowerment, medication adherence, perceived health data, distress, healthcare utilization rates, and HbA1c by attachment style,. First, univariate descriptive statistics were calculated to examine the mean and standard deviation for all demographic information (e.g., gender, race, marital status, and insurance status), psychosocial data (e.g., depression, social support, empowerment, health perception, and distress), behavioral data (medication adherence and healthcare utilization data) as well as relationship styles (e.g., secure, fearful, preoccupied, or dismissing). Bivariate analyses (e.g., ANOVA and chi-square tests) were then conducted to further examine demographic, psychosocial, and behavioral data by attachment style to explore the relationships between and among variables. The healthcare utilization data was also visually summarized with histograms as a means to determine the appropriate modeling tests. In order to test each hypothesis a combination of chi-square, ANOVA, and regression models were explored.

Demographics

The final sample for the study consisted of 148 individuals including 92 females (62.2%) and 56 males (37.8%). The majority of the sample (71.6%, N=106) racially identified themselves as African American (AA) and 25.7% (N=38) as Caucasian. Married patients totaled 38.5% (N=57) and 20.3% (N= 30) were divorced. Approximately 2/3 were on Medicare or Medicaid (69%, N=102), 25% had private insurance (N=37), and 5.4% (N=8) were uninsured. Half of the patients had DM for ten years or less (50.7%, N=75), and 66.2% (N=98) were between the ages of 40 and 64 (M=59.29, SD=9.86) (see Table 1).

Psychosocial Measures

Table 2 summarizes the means and standard deviations of psychosocial assessment data in regard to depression (PHQ-9), social support (modified DFSS), empowerment (DES-SF), health perceptions (CDC HRQOL), and DM distress (DDS-17). This table highlights patients reported the least social support from parents and partners/spouses and most from extended family and friends. In general empowerment scores were high, ranging from 3.91 to 4.64, on a 5-point Likert scale, with the lowest empowerment item about determining if change was necessary. General health perceptions fell between fair and good, with very few unhealthy mental or physical days in the previous 30 days. DM distress levels were low, with the highest level of distress reported on the emotional burden subscale.

Depression. The overall mean PHQ-9 score was 5.86 (SD=4.9) indicating low or mild levels of depression. However, 32 (21%) patients were at or above the cut off score of ≥10, indicating moderate depression. These patients did on average have more total completed (M=15.97, SD=10.64) outpatient health care use compared to the entire sample. In Table 3, PHQ-9 data is presented across patient demographic variables displaying associations between total PHQ-9 scores, age, and marital status. The relationship between PHQ-9 scores and age (*p*=.002) was present with higher scores among the 18-39 year old category (M=8.33, SD=2.73). For marital status and depression (*p*=.014), lower total scores (M=4.82, SD=3.99) were found among the married group and highest scores among the separated group (M=9.09, SD=5.78).

Social Support. The highest level of support came from Factor 3-Extended Family and Friends on the modified DFSS (M=11.12; SD=5.5). Factor three is comprised of questions that include relatives, friends, children, and family members with DM. The next highest levels of social support came from Factor 2-Community and Medical Support (M=9.6, SD=5.6) with Factor 1-Parents and Partner/Spouse, having had the lowest levels of social support reported (M=4.27; SD=4.9) (see Table 2).

Social support and demographic data were explored with ANOVAs and summarized in Table 4. Relationships were found among gender (*p*=.022), marital status (*p*=.000), and insurance (*p*=.015). An association with gender was found on Factor-3 (extended family and friends) (females M=11.94, SD=5.58; males M=9.80, SD=5.16). Not surprisingly those patients who were married reported getting more social support from their partner/spouse (Factor-1) (M=8.32, SD=4.29) in comparison to the other relationship statuses (e.g., divorced, widowed, separated, and never married), however the highest scores for relationship statuses were found on Factor 3. This was also true for those with private insurance (M=6.38, SD=4.90) compared to other types of insurance (e.g., Medicare, Medicaid) or a lack of insurance coverage (*p*=.015). As with gender both racial groups (AA – M=11.47, SD=5.78; Not AA – M=10.22, SD=4.70) reported the highest level of social support from extended family and friends, although not significant (*p*=.219).

Empowerment. Patients reported fairly high empowerment scores on all eight dimensions of the DES-SF and three of the dimensions are in Table 5. Means ranged from 3.91 (SD=1.2) on Dimension-1 (i.e., measuring knowledge of the parts patients are dissatisfied with in managing their DM and determining when change is needed), to 4.64 (SD=.68) on Dimension-6 (i.e., ability to ask for support when needed). All responses were on a 5-point Likert scale. A significant association was found between race (*p*=.038) and empowerment on Dimension-1, Dimension-3 (i.e., trying out different ways of overcoming barriers or working through obstacles) (*p*=.018), and Dimension-4 (i.e., finding ways to feel better about having DM and asking others for help) (*p*=.005) with higher scores among AA on all three. No significant relationships occurred for gender, age, type of insurance, or marital status.

Health Perceptions. The majority of patients reported their general health to be very good (N=31, 20.9%), good (N=59, 39.9%) or fair (N=38, 25.7%). Specific to physical health 108 patients (73%) said their health was not good less than 14 out of the previous 30 days. Similar findings were reported for mental health in that 121 patients (81.8%) said their mental health was not good less than 14 out of the previous 30 days. When physical and mental health were combined 132 patients (89.2%) said their physical and mental health were not good less than 14 days out of the previous 30 days. A significant association was found among marital statuses (*p*=.001) with divorced patients having the most unhealthy physical (M=.53, SD=.507) days and separated (M=.55, SD=.522) patients having more unhealthy mental (*p*=.000) health days. Age was also associated with physical (*p*=.0000) and mental (*p*=.001) health perceptions with higher physical health mean scores found among the 40-64 year olds (M=.38, SD=.487), and higher mean scores for mental health among the youngest group of 18-39 year olds (M=.33, SD=.516, *p*=.001).

DM Distress. Four subscales made up the DDS-17 (emotional burden, physician related distress, regime related distress, and interpersonal distress). The highest level of burden was found on the 6-pt emotional distress subscale (M=2.02, SD=1.2), indicating only a “slight problem”. Responses to the physician related distress (M=1.31, SD=.77), regimen related distress (M=1.95, SD=1.09), and interpersonal distress (M=1.62, SD=1.05) subscales indicated very little distress.

Table 6 displays all demographic data by each of the four subscales. Significant associations were found within the demographic categories of gender (*p*=.020), age (*p*=.002), and insurance (*p*=.036) on the emotional burden subscale. An association between race (*p*=.016) was found on the physician related distress subscale. There were no significant relationships between demographics on either the regimen related or interpersonal subscales.

Behavioral Data

Patient behavioral data, including medication adherence and healthcare utilization rates, is summarized in Table 7. Total completed, canceled and no show visits are included.

Medication Adherence. In terms of medication management for DM, 138 (93.2%) patients reported they take meds, with 104 (70.3%) taking oral medicine and 70 (47.3%) injections of insulin. With a possible range of 0-7 and lower scores representing greater medication adherence, 77.5% (N=62) scored between 0 and 2 indicating strong adherence (M=2.38, SD=1.37).

Healthcare Utilization. Outpatient PC, specialty care, and behavioral health utilization rates were gathered. PC utilization consisted of appointments in the departments of family medicine, internal medicine, and pediatrics. Specialty care consisted of visits within the departments of cardiology, pulmonary, endocrinology, and nephrology to name a few. Behavioral health included psychiatry and behavioral health specialists in the department of family medicine.

The average number of total visits was 21.29 (SD=22.23) including 11.51 (SD=8.29) PC, 7.50 (SD=16.18) specialty visits, and 1.79 (SD=4.18) behavioral health visits. On average the total number of outpatient appointments completed was 13.64 (SD=13.12) which included 7.80 (SD=5.72) PC visits, 4.32 (SD=8.85) specialty visits, and only 1.12 (SD=2.87) behavioral health visits. The mean number of days between when an appointment was scheduled and occurred was 32 days. Inpatient hospital admissions rates for one calendar year showed little utilization with no admissions for 71.6% of patients, 14.9% with one admission, and 13% with two or more. The data is overdispersed in that the comparison is between the mean and the standard deviation squared, or variance, so the values are very different. Very few patients have a large amount of utilization.

When medication adherence, utilization rates, and average time between scheduling an appointment and having the appointment were explored by gender and race the only association (*p*=.040) found was between race and PC No Show Visits where AAs averaged 1.50 no shows (SD=1.84), and the not AA group averaging .85 no shows (SD=1.21).

Relationship Style

Attachment Style. Figure 1 displays how the sample of patients were grouped into each of the four relationships styles: secure (N=55, 37.2%); fearful (N=21, 14.2%); preoccupied (N=13, 8.8%); and dismissing (N=59, 39.9%). Compared to estimates of the general population and of medical populations the study sample consisted of slightly less secure patients, and slightly more dismissing ones. The fearful and preoccupied were similar to published estimates. Compared to previous studies (Bartholomew & Horowitz, 1991; Ciechanowski & Katon, 2006) one would expect to see approximately 55% of general population and 44% of medical populations in the secure category; 5-10% of the general population and 12-20% of a medical population in the fearful category; 8-15% of the preoccupied style in both the general and medical populations; and 25% of the general population and 36% of the medical population as dismissing.

Hypothesis Testing

To test for relationships among the variables a combination of chi-square, ANOVA and regression analyses were conducted. The psychosocial and behavioral data was explored through demographic and relationship style in order to answer each of the four hypotheses.

Hypothesis One. Building upon the basic demographic data presented earlier, demographic information by relationship style is presented in Table 8. Chi-square analyses were conducted to study patient demographics and how they each align with certain attachment styles to depict patient summaries. In terms of gender, females tended to be secure, while males were more often dismissing. The secure attachment style included 39 (70.9%) of the 92 females, and only 16 (29.1%) of the 56 males. Eight males (38.1%) and 13 (61.9%) females had fearful styles. The preoccupied style included seven (53.8%) females and six (46.2%) males. Lastly, the dismissing style consisted of 33 (55.9%) females and 26 (44.1%) males. The largest percentage of females described themselves as securely attached, while the largest percentage of males reported their relationship style to be dismissing.

AAs were most often dismissing (N=47, 44.3%), while non-AAs were most often secure (N=18, 42.9%). Thirty-seven (34.9%) of AA reported their attachment style to be secure, 13

(12.3%) fearful, and 9 (8.5%) preoccupied. Among the remaining patients in the non-AA group 8 (19%) were fearful, 4 (9.5%) were preoccupied and 12 (28.6%) were dismissing. Although this begins to establish a profile for a sample of AA patients living in a rural area, the statistical test does not provide the ability to generalize to a larger population of AAs. In general, AAs may not have a different attachment style distribution compared to non-AAs, but this rural, PC sample is different in its make-up as compared to participants from prior health care and attachment research studies.

Most of the patients were between the ages of 40 and 64 years of age. Within the secure group of those in this age category were 40 (72.7%) patients. The remaining were distributed across dismissing (N=33, 55.9%), fearful (N=17, 81.0%), and preoccupied (N=8, 61.5%) respectively. Most of the sample had insurance through either Medicaid (N=51) or Medicare (N=51). There were 30 (55.6%) patients within the secure group, 15 (71.4%) of the fearful group, 10 (76%) of the preoccupied style, and 47 (79.7%) of the dismissing group. 38.9% (21) of the secure group had private insurance, while only 15.3% (N=9) of the dismissing group had private insurance. In terms of marital status most secure (N=25, 46.3%), fearful (N=7, 33.3%) and dismissing (N=22, 37.3%) patients were married. Preoccupied patients were more often widowed (N=5, 38.5%). The highest percentage of those reporting that they had never been married (N=22) were dismissing (N=13, 59.0%). Demographic data by relationship style is also summarized in Figure 2.

To summarize, this rural PC sample of patients with DM in terms of gender and race looks different than those in previous studies with predominantly Caucasian samples (Ciechanowski et al., 2005; Ciechanowski et al., 2001; Ciechanowski, Russo, Katon, Von Korff, et al., 2006), as it has fewer secure and more dismissing patients than found in previous research.

Females most often reported their relationship style as secure whereas males reported more often a dismissing style. The majority of AA participants were found in the dismissing style, while the most non-AAs were in the secure group.

Hypotheses Two and Three. Patients with DM and secure attachment styles would be more likely to report: (a) higher levels of social support, DM empowerment, and better health perceptions; and (b) greater mental health well-being (less depression and less distress). In contrast, insecure attachment style patients with DM (preoccupied, fearful, and dismissing) (Ciechanowski & Katon, 2006; Ciechanowski et al., 2001 Ciechanowski, Russo, Katon, Von Korff, et al., 2006) would be more likely to report: (a) less social support, DM empowerment and less healthy mental and physical health perceptions; and (b) lower mental health well-being (moderate to severe depression and more distress).

Findings from the ANOVAS (see Table 9), highlighted a variety of significant associations between relationship styles and social support, empowerment, and health perceptions; as well as depression and distress. An association was present for social support measured with Factor-3 (i.e., extended family and friends) (*p*=.000); empowerment on Dimensions-5 (i.e. supporting oneself) (*p*=.001) and 6 (i.e., coping with feelings and emotions) (*p*=.017); healthy mental health days (*p*=.001); and with depression (*p*=.016) and the interpersonal distress subscale (*p*=.008), all measures of the psychosocial and mental health well-being data.

Secure patients did report getting their highest levels of social support from Factor-3, extended family and friends (M=13.44, SD=5.83), but so did dismissing patients (M=9.92, SD=4.52). Fearful patients reported their highest level of social support on Factor-2 (i.e., community and medical support) (M=10.90, SD=6.48), while preoccupied reported their highest levels of support on Factor-1 (i.e., parent & partner/spouse). Secure patients did not report the highest levels of social support on all three factors.

In terms of empowerment and relationship styles, secure patients reported higher mean scores on six of the eight dimensions. Dismissing patients had the lowest scores on four of the dimensions, and fearful patients were lowest on three dimensions. Preoccupied patients were lowest on the last dimension (i.e., choosing appropriate care based goals for change). For overall health perceptions secure patients did have the highest average (M=3.13, SD=.963), and the fewest number of unhealthy mental (M=.13, SD=.336) or physical health (M=.31, SD=.466) days. Fearful had the highest average of poor mental health (N=.43, SD=.507) and physical health (M=.38, SD=.498) days, albeit very few.

For mental well-being secure patients had lower PHQ-9 scores (M=5.09, SD=4.28), compared to fearful (M=6.43, SD=4.95), preoccupied (M=9.77, SD=6.74) or dismissing (M=5.53, SD=4.70). On the DDS-17 dismissing patients had the least amount of distress on all four subscales. Preoccupied patients had the highest average of distress on the emotional burden, physician-related, and regimen-related subscales. Among fearful patients distress levels were higher on the emotional burden and interpersonal subscales.

Secure patients appear to be psychosocially healthy, however they did not consistently have higher social support, empowerment, and healthier perceptions along with less depression and distress. Fearful patients seem to be less empowered, and preoccupied ones more distressed. Dismissing style patients are interesting in that they reported very little distress yet less empowerment on several dimensions and less social support.

Hypothesis Four. Lastly, the literature has shown patient barriers (i.e. depression) to strict treatment adherence exist and often result in more healthcare utilization (Ciechanowski et al., 2000; Gibson et al., 2010; Hepke et al., 2004). To examine this issue it was hypothesized that among patients with certain combinations of psychosocial and behavioral profiles, it was predicted that total healthcare utilization rates and HbA1c values would be higher.

Similar to the self-report findings, the healthier and closest to goal HbA1c values were found among the secure patients (See Table 10). HbA1c ranged from 4.6% to 14% (M=7.98, SD=2.10). Secure patients had an average HbA1c value of 7.4% compared to dismissing who had a value of 8.4% within a range of 5.3% and 14%, the highest of all four relationship styles. Findings from the medication adherence scale and healthcare utilization are presented by attachment style in Table 11 and show an interesting pattern, yet no significance. For total completed outpatient visits, completed PC, and specialty visits secure patients have the highest averages of outpatient healthcare utilization. A finding quite different from previous literature is the lack of utilization among the preoccupied patients, those who have previously been shown to use the most. The only aspect of care that preoccupied patients use the most of was completed behavioral health visits. Dismissing patients had the fewest completed behavioral health visits, and fearful had the fewest hospitalizations. In Table 12 healthcare utilization is presented along with relationship style, demographic and psychosocial data. Very little statistical significance occurred, and among the variables where there was significance, clinically it would not be of interest due to the utilization rates being so low.

Discussion

Overall, even though attention has been paid to the importance of biomedically, psychologically, and socially understanding DM, the incidence and outcomes of DM have not improved (Tricco et al., 2012), care remains largely fragmented (Berwick, 2011), and costs are greater to the patient and the healthcare economy (ADA, 2013). Researchers and interventionists have simply not uncovered the key to helping patients with DM manage their diseases successfully (Tricco et al., 2012).

This cross-sectional study provided a glimpse of a more racially diverse sample and the differences in percentages of patients categorized in each attachment style compared to existing literature with predominantly White samples (Ciechanowski et al., 2004; Ciechanowski et al., 2001; Ciechanowski et al., 2002). Compared to estimates of the general and medical populations the study sample consisted of less secure patients and more dismissing ones, presenting an interesting clinical quandary (Ciechanowski & Katon, 2006). How should primary care, specialists, and behavioral health providers work with a higher percentage of dismissing patients?

Dismissing patients have a preference towards autonomy in their relationship style that appears to carry over into their relationships with healthcare providers (Ciechanowski & Katon, 2006). A patient's self-management strategy may have more to do with their relationship style than any sense of defiance. Perhaps one way to reframe the non-compliant label often placed upon patients is with a better understanding of attachment theory by providers and patients. It could serve to establish positive provider-patient relationships and potentially improve health. A greater need still lies in knowing how to best collaborate with fearful and preoccupied style patients. There are fewer of these individuals in the general and medical populations, which impacts the ability to include them in studies. In this study the number of fearful and preoccupied patients were similar to published estimates (Ciechanowski & Katon, 2006).

The differences in the racial make-up of this study supported the decision to not combine any of the four relationship styles, as occasionally done in published studies (Ciechanowski et al., 2010), so that more could be learned from the sample and each relationship style. Combining styles could have potentially hidden differences, particularly among those who are dismissing as they would have been paired with fearful. Dismissing style patients in this study used more health care than preoccupied style patients, unlike previously published studies that demonstrated they often used less. The same would have been true if the preoccupied style patients had been paired with securely attached patients. Those with a preoccupied style used less health care than in other research (Ciechanowski, 2002), which may have been difficult to determine had they been paired with secure. Previously, preoccupied style patients had been shown to have lower HbA1c values (Ciechanowski et al., 2004), yet secure patients had the lowest in this study. These findings may have been less evident if patients would have been combined.

In the most recent Standards of Medical Care from the ADA (ADA, 2013), they included a statement that it is “preferable to incorporate psychosocial assessment and treatment into routine care rather than waiting for identification of a specific problem or deterioration in psychological status” (p S26). The categorization of outpatient utilization allowed for further exploration, particularly among behavioral health visits. Prior research examined primary care utilization and costs (Ciechanowski, Russo, Katon, Simon, et al., 2006; Ciechanowski et al., 2002), but not specialty or behavioral care. Among participants, very little outpatient behavioral health care was utilized. The most frequently utilized behavioral health service was psychiatry in comparison to outpatient psychotherapy care. This potentially indicated more serious mental health issues and psychotropic medication management needs among the sample studied. As a model of integrated care grows within the PC specialization, it will be interesting to track if the use of behavioral health services increases over time and their effectiveness in reducing DM distress and increasing biopsychosocial gains in overall health.

Limitations

First and foremost the study had a small sample size, limiting the predictive ability to model healthcare utilization by relationship style as well as generalizability of the findings. Secondly, additional demographic data regarding SES status, educational level, and employment status would have been helpful to have a more comprehensive demographic profile for the sample. Thirdly, additional biomarkers (e.g., blood pressure, cholesterol), as well as electronic health record data points (e.g., comorbid diagnoses, total prescriptions, total cost of health care) would have been helpful in obtaining a more tangible patient summary of the sample. Lastly, because of the emphasis on how patients form and maintain relationships, a more in-depth relationship history would have been useful to integrate.

Conclusions

Based upon the differences between this study and those prior, more attachment based research with diverse samples living in rural areas is needed. As with other studies, there continues to be a need to study more participants who represent the fearful and preoccupied type, as they are often fewer in number and less is known about their impact on the healthcare system and its impact on them.

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Table 1

Patient Demographics

		N	%
Gender	Females	92	62.2
	Males	56	37.8
Race	African American	106	71.6
	Not African American	42	28.4
Age Category	18-39	6	4.1
	40-64	98	66.2
	65+	44	29.7
Marital Status	Married	57	38.5
	Divorced	30	20.3
	Widowed	27	18.2
	Separated	11	7.4
	Never Married	22	14.9
Insurance Status	Private	37	25.0
	Medicare	51	34.5
	Medicaid	51	34.5
	Uninsured	8	5.4
Years with DM in Categories	0-5	38	25.7
	5-10	37	25.0
	10-15	27	18.2
	15-20	22	14.9
	20+	18	12.2

Table 2

Psychosocial Measures

	N	Mean	Std Dev	Min	Max
PHQ-9	148	5.86	4.91	0	20
FSS-Factor 1-Parent & Spouse/Partner	147	4.27	4.95	0	24
FSS-Factor 2-Community & Medical Support	147	9.66	5.63	1	26
FSS-Factor 3-Extended Family & Friends	145	11.12	5.51	0	25
DES-SF-Dimension 1-Determining if change is needed	148	3.91	1.20	0	5
DES-SF-Dimension 2-Constructing a plan	147	4.33	.953	1	5
DES-SF-Dimension 3-Working through obstacles	147	4.30	.895	1	5
DES-SF-Dimension 4-Asking for help from others	147	4.15	1.13	1	5
DES-SF-Dimension 5-Supporting oneself	145	4.16	1.11	0	5
DES-SF-Dimension 6-Coping with feelings and emotions	148	4.64	.682	1	5
DES-SF-Dimension 7-Rocusing on intrinsic motivation	146	4.60	.660	2	5
DES-SF-Dimension 8-Choosing appropriate care based on goals for change	148	4.55	.703	2	5
–HRQOL-4 - General Health	148	2.86	1.01	0	5
HRQOL-4-Physical Health (days not good)	148	.27	.446	0	1
HRQOL-4-Mental Health (days not good)	148	.18	.388	0	1
HRQOL-4-Days physical/mental health kept you from activities	148	.11	.312	0	1
DDS-17-Emotional Burden	147	2.02	1.27	1	6
DDS-17-Physician Related Distress	147	1.31	.779	1	6
DDS-17-Regime Related Distress	146	1.95	1.09	1	6
DDS-17-Interpersonal Distress	147	1.62	1.05	1	6

Table 3

Demographic Data and Depression

PHQ-9						
		N	Mean	Std Dev	ANOVA F	*p*-value
Gender	Females	92	6.03	4.91		
	Males	56	5.59	4.95	.281	.597
Race	African American	106	5.94	5.05	.095	.759
	Not African American	42	5.67	4.599		
Age Category	18-39	6	8.33	2.73	6.44	.002*
	40-64	98	6.65	5.35		
	65+	44	3.77	3.20		
Marital Status	Married	57	4.82	3.99	3.25	.014*
	Divorced	30	6.90	5.30		
	Widowed	27	4.56	4.30		
	Separated	11	9.09	5.78		
	Never Married	22	7.27	5.86		
Insurance Status	Private	37	4.27	3.64	1.97	.121
	Medicaid	51	6.75	5.48		
	Medicare	51	6.14	4.79		
	Uninsured	8	6.50	6.07		

Table 4

Demographic Data and Social Support

		Modified Dunst Social Support Scale														
		Factor 1 Parent/Partner/Spouse					Factor 2 Community and Medical Support					Factor 3 Extended Family and Friends				
		N	M	SD	F	*p*	N	M	SD	F	*p*	N	M	SD	F	*p*
Gender	Females	91	3.67	4.72	3.58	.060	91	9.91	5.68	.477	.491	89	11.94	5.58	5.33	.022*
	Males	56	5.25	5.21			56	9.25	5.58			56	9.80	5.16		
Race	AA	105	4.28	5.05	.00	.987	105	9.90	5.51	.692	.407	104	11.47	5.78	1.52	.219
	Not AA	42	4.26	4.77			42	9.05	5.96			41	10.22	4.70		
Age Category	18-39	5	8.20	4.65	2.81	.063	5	10.20	9.03	1.13	.325	5	9.60	5.27	.884	.415
	40-64	98	4.55	5.24			98	10.11	5.69			96	11.54	5.42		
	65+	44	3.20	4.03			44	8.59	5.04			44	10.36	5.74		
Marital Status	Married	57	8.32	4.29	27.11	.000*	57	9.32	5.21	.223	.925	57	10.74	5.00	1.82	.127
	Divorced	30	1.33	1.80			30	9.60	5.51			30	10.53	5.39		
	Widowed	27	1.19	2.23			27	9.67	6.17			26	13.38	5.97		
	Separated	11	3.36	7.08			11	10.18	6.50			11	12.45	6.83		
	Never Married	21	2.14	3.59			21	10.62	6.20			20	9.60	5.31		
Insurance	Private	37	6.38	4.90	3.59	.015*	37	8.62	4.59	1.18	.320	37	11.05	5.02	.194	.900
	Medicaid	50	2.96	4.97			50	10.06	6.35			49	11.39	5.45		
	Medicare	51	4.02	4.80			51	9.57	5.16			51	11.00	6.18		
	Uninsured	8	4.38	3.81			8	12.50	8.036			7	9.71	3.773		

*Indicates significance, $p<.05$

Table 5

Demographic Data and Empowerment

		Diabetes Empowerment Scale														
		Dimension 1 Determining Change					Dimension 3 Working Through Obstacles					Dimension 4 Asking for Help From Others				
		N	M	SD	F	*p*	N	M	SD	F	*p*	N	M	SD	F	*p*
Gender	Females	92	3.93	1.26	.085	.771	91	4.37	.784	1.656	.200	91	4.18	1.17	.126	.723
	Males	56	3.88	1.11			56	4.18	1.04			56	4.11	1.07		
Race	AA	106	3.78	1.24	4.38	.038*	105	4.41	.863	5.75	.018*	105	4.31	1.01	8.07	.005*
	Not AA	42	4.24	1.05			42	4.02	.924			42	3.74	1.32		
Age Category	18-39	6	4.33	.816	2.446	.090	6	4.33	.816	.707	.495	5	4.40	.894	.900	.409
	40-64	98	4.03	1.17			98	4.36	.815			98	4.06	1.25		
	65+	44	3.59	1.26			43	4.16	1.06			44	4.32	.857		
Marital Status	Married	57	3.84	1.26	.576	.681	57	4.21	1.01	1.104	.357	57	4.12	1.05	.263	.901
	Divorced	30	3.70	1.14			30	4.40	.770			30	4.03	1.21		
	Widowed	27	4.11	1.18			27	4.22	.751			27	4.33	1.03		
	Separated	11	3.91	1.57			10	4.80	.632			11	4.09	1.44		
	Never Married	22	4.09	.971			22	4.23	.973			21	4.14	1.27		
Insurance	Private	37	3.92	1.25	1.02	.385	37	4.32	.915	.047	.986	37	4.19	1.02	.716	.544
	Medicaid	51	4.02	1.12			51	4.27	.918			50	4.06	1.20		
	Medicare	51	3.71	1.28			50	4.28	.858			51	4.29	1.08		
	Uninsured	8	4.38	.916			8	4.38	1.06			8	3.75	1.58		

*Indicates significance, $p<.05$

Table 6

Demographic Data and Diabetes Related Distress

		Diabetes Distress Scale																			
		Emotional Burden					Physician Related Distress					Regimen Related Distress					Interpersonal Distress				
		N	M	SD	F	*p*	N	M	SD	F	*p*	N	M	SD	F	*p*	N	M	SD	F	*p*
Gender	Females	91	2.21	1.39	5.56	.020*	91	1.29	.685	.222	.638	91	2.01	1.12	.717	.399	91	1.67	1.06	.567	.453
	Males	56	1.71	.980			56	1.35	.917			55	1.85	1.04			56	1.54	1.03		
Race	AA	105	2.02	1.28	.000	.993	105	1.41	.900	5.971	.016*	104	1.96	1.11	.002	.968	105	1.56	.977	1.34	.248
	Not AA	42	2.02	1.25			42	1.07	.147			42	1.95	1.05			42	1.78	1.21		
Age	18-39	6	3.07	1.26	6.32	.002*	6	1.17	.408	1.302	.275	6	2.23	1.21	1.31	.273	6	2.17	1.98	1.31	.272
	40-64	97	2.17	1.37			97	1.25	.616			97	2.03	1.11			97	1.65	1.06		
	65+	44	1.54	.801			44	1.47	1.07			43	1.73	1.02			44	1.47	.824		
Marital Status	Married	56	1.84	1.11	1.20	.311	56	1.24	.705	.692	.599	56	1.83	1.01	.474	.754	56	1.74	1.30	.662	.619
	Divorced	30	2.12	1.44			30	1.32	.956			29	2.10	1.14			30	1.71	1.07		
	Widowed	27	1.81	1.10			27	1.49	1.00			27	1.90	1.29			27	1.53	.838		
	Separated	11	2.38	1.57			11	1.11	.205			11	1.95	1.12			11	1.27	.389		
	Never Married	22	2.40	1.43			22	1.38	.550			22	2.14	1.04			22	1.48	.740		
Insurance	Private	36	1.90	1.01	2.91	.036*	36	1.15	.323	1.31	.271	36	1.85	.905	1.040	.377	36	1.77	1.39	.469	.704
	Medicaid	51	2.37	1.49			51	1.47	.888			50	2.06	1.07			51	1.65	.988		
	Medicare	51	1.70	.978			51	1.25	.837			51	1.86	1.13			51	1.53	.882		
	Uninsured	8	2.48	1.936			8	1.38	1.06			8	2.50	1.67			8	1.42	.729		

*Indicates significance, p<.05

Table 7

Patient Behavioral Measures (Medication Adherence & Healthcare Utilization)

	N	Mean	Std Dev	Min	Max	Gender M (SD)		Race M (SD)	
						F	M	AA	Not AA
MMAS	138	2.38	1.37	0	6	2.39 (1.43)	2.38 (1.29)	2.45 (1.37)	2.21 (1.39)
Total Completed Outpatient	143	13.64	13.1	0	91	14.23 (14.36)	12.69 (10.91)	12.62 (10.87)	16.17 (17.43)
Total Canceled Outpatient	143	5.17	8.57	0	88	6.01 (10.32)	3.84 (4.28)	4.86 (5.24)	5.95 (13.80)
Total No Show Outpatient	143	2.48	3.19	0	18	2.31 (3.39)	2.75 (2.86)	2.62 (3.28)	2.12 (2.96)
Total Visits	143	21.29	22.23	2	188	22.53 (25.26)	19.31 (16.30)	20.11 (17.16)	24.24 (31.60)
Primary Care Completed	143	7.80	5.72	0	30	7.95 (5.630	7.56 (5.91)	7.61 (5.37)	8.29 (6.57)
Primary Care Canceled	143	2.39	2.81	0	15	2.74 (2.87)	1.84 (2.64)	2.65 (2.98)	1.76 (2.24)
Primary Care No Show	143	1.31	1.70	0	8	1.18 (1.71)	1.53 (1.68)	1.50 (1.84)	.85 (1.21)
Total Primary Care	143	11.51	8.29	0	42	11.88 (8.26)	10.93 (8.39)	11.75 (8.04)	10.90 (8.96)
Specialty Care Completed	143	4.32	8.85	0	77	4.51 (10.18)	10.18 (6.24)	3.75 (7.00)	5.73 (12.32)
Specialty Care Canceled	143	2.30	6.86	0	75	2.78 (8.50)	1.53 (2.49)	1.79 (3.22)	3.56 (11.77)
Specialty Care No Show	143	.88	1.73	0	11	.86 (1.82)	.91 (1.57)	.83 (1.75)	1.00 (1.67)
Total Specialty Care	143	7.50	16.18	0	157	8.16 (19.30)	6.45 (9.28)	6.38 (11.04)	10.29 (24.70)
Behavioral Health Completed	143	1.12	2.87	0	21	1.23 (2.96)	.95 (2.73)	1.02 (2.89)	1.37 (2.85)
Behavioral Health Canceled	143	.42	1.18	0	7	.42 (1.12)	.42 (1.30)	.35 (1.06)	.59 (1.44)

Table 7

	N	Mean	Std Dev	Min	Max	Gender M (SD)		Race M (SD)	
						F	M	AA	Not AA
Behavioral Health No Show	143	.25	.851	0	7	.22	.31	.27	.20
						(.633)	(1.12)	(.935)	(.601)
Total Behavioral Health	143	1.79	4.18	0	21	1.86	1.67	1.65	2.15
						(4.00)	(4.49)	(4.04)	(4.55)
Total Hospitalizations	147	.71	1.76	0	11	.62	.88	.66	.86
						(1.46)	(2.15)	(1.65)	(2.00)
Means Days from Schedule To Appointment	143	32.79	16.86	1.11	96.33	32.29	31.99	31.99	34.79
						(16.02)	(18.24)	(16.34)	(18.14)

Table 8

Relationship Style and Patient Demographics

		Secure	Fearful	Preoccupied	Dismissing	X^2	p-value	N
Gender	Female	39 (70.9%)	13 (61.9%)	7 (53.8%)	33 (55.9%)	3.1	.370	92
	Male	16 (29.1%)	8 (38.1%)	6 (46.2%)	26 (44.1%)			56
Total		55 (100%)	21 (100%)	13 (100%)	59 (100%)			148
Race	AA	37 (67.3%)	13 (61.9%)	9 (69.2%)	47 (79.7%)	3.4	.334	106
	Not AA	18 (32.7%)	8 (38.1%)	4 (30.8%)	12 (20.3%)			42
Total		55 (100%)	21 (100%)	13 (100%)	59 (100%)			148
Age Group	18-39	2 (3.6%)	1 (4.8%)	0 (0.0%)	3 (5.1%)	7.1	.306	6
	40-64	40 (72.7%)	17 (81.0%)	8 (61.5%)	33 (55.9%)			98
	65+	13 (23.6%)	3 (14.3%)	5 (38.5%)	23 (39.0%)			44
Total		55 (100%)	21 (100%)	13 (100%)	59 (100%)			148
Insurance	Private	21 (38.9%)	5 (23.8%)	2 (15.4%)	9 (15.3%)	11.64	.234	37
	Medicaid	17 (31.5%)	8 (38.1%)	6 (46.2%)	20 (33.9%)			51
	Medicare	13 (24.1%)	7 (33.3%)	4 (30.8%)	27 (45.8%)			51
	Uninsured	3 (5.6%)	1 (4.8%)	1 (7.7%)	3 (5.1%)			8
Total		54 (100%)	21 (100%)	13 (100%)	59 (100%)			147
Marital Status	Married	25 (46.3%)	7 (33.3%)	3 (23.1%)	22 (37.3%)	12.58	.400	57

Table 8

		Secure	Fearful	Preoccupied	Dismissing	X²	p-value	N
	Divorced	11 (20.4%)	6 (28.6%)	3 (23.1%)	10 (16.9%)			30
	Widowed	9 (16.7%)	4 (19.0%)	5 (38.5%)	9 (15.3%)			27
	Separated	2 (3.7%)	3 (14.3%)	1 (7.7%)	5 (8.5%)			11
	Never Married	7 (13.0%)	1 (4.8%)	1 (7.7%)	13 (22.0%)			22
Total		54 (100%)	21 (100%)	13 (100%)	59 (100%)			147

Table 9

Relationship Style and Psychosocial Measures

	Secure	Fearful	Preoccupied	Dismissing	ANOVA F	p-value	N
PHQ-9 Mean (SD)	5.09 (4.28)	6.43 (4.95)	9.77 (6.74)	5.53 (4.70)	3.54	.016*	147
FSS-Factor 1-Parent & Spouse/Partner	4.28 (4.65)	3.81 (5.09)	4.62 (6.71)	4.36 (4.36)	.086	.968	146
FSS-Factor 2-Community & Medical Support	10.35 (5.28)	10.90 (6.48)	10.77 (7.07)	8.34 (5.14)	1.89	.133	146
FSS-Factor 3-Extended Family & Friends	13.44 (5.83)	8.43 (4.83)	11.62 (6.19)	9.92 (4.52)	6.35	.000*	144
DES-SF-Dimension 1-Determining if change is needed	3.87 (1.40)	3.95 (1.20)	4.23 (.832)	3.86 (1.09)	.356	.785	148
DES-SF-Dimension 2-Constructing a plan	4.47 (.858)	4.38 (.805)	4.23 (.927)	4.21 (1.08)	.796	.498	147
DES-SF-Dimension 3-Working through obstacles	4.38 (.871)	4.33 (.856)	4.31 (.751)	4.21 (.969)	.368	.776	147
DES-SF-Dimension 4-Asking for help from	4.31 (.987)	4.14 (1.23)	4.15 (.801)	4.00 (1.28)	.717	.544	147
DES-SF-Dimension 5-Supporting oneself	4.61 (.596)	3.71 (1.52)	4.23 (.927)	3.88 (1.22)	5.82	.001*	145
DES-SF-Dimension 6-Coping with feelings and emotions	4.84 (.420)	4.33 (1.01)	4.46 (.519)	4.59 (.722)	3.49	.017*	148
DES-SF-Dimension 7-Focusing on intrinsic motivation	4.75 (.585)	4.29 (.902)	4.62 (.506)	4.56 (.623)	2.72	.046*	146
DES-SF-Dimension 8-Choosing appropriate care based on goals for change	4.60 (.710)	4.67 (.483)	4.38 (.961)	4.51 (.704)	.588	.624	148

Table 9

	Secure	Fearful	Preoccupied	Dismissing	ANOVA F	p-value	N
HRQOL-4 - General Health	3.13 (.963)	2.71 (.845)	2.69 (1.03)	2.71 (1.08)	1.99	.118	148
HRQOL-4-Physical Health (days not good)	.31 (.466)	.38 (.498)	.31 (.480)	.19 (.393)	1.30	.275	148
HRQOL-4-Mental Health (days not good)	.13 (.336)	.43 (.507)	.38 (.506)	.10 (.305)	5.73	.001*	148
DDS-17-Emotional Burden	1.98 (1.19)	2.47 (1.40)	2.52 (1.70)	1.78 (1.14)	2.31	.079	147
DDS-17-Physician Related Distress	1.27 (.761)	1.37 (1.04)	1.65 (.904)	1.25 (.645)	1.06	.368	147
DDS-17-Regimen Related Distress	1.98 (1.11)	2.20 (1.30)	2.52 (1.19)	1.71 (.920)	2.56	.057	146
DDS-17-Interpersonal Distress	1.51 (.973)	2.21 (1.47)	2.05 (1.16)	1.41 (.817)	4.01	.008*	147

*Indicates significance, *p*<.05

Table 10

Relationship Style and HbA1c

	Secure	Fearful	Preoccupied	Dismissing	ANOVA F	p-value	N
HbA1c	7.37 (1.64)	8.18 (2.07)	8.14 (2.06)	8.42 (2.38)	2.58	.055	147

Table 11

Relationship Style and Behavioral Measures

	Secure	Fearful	Preoccupied	Dismissing	ANOVA F	p-value	N
MMAS M (SD)	2.32 (1.36)	2.00 (1.15)	2.83 (1.19)	2.47 (1.48)	1.03	.381	138
Total Completed Outpatient	15.40 (15.55)	13.29 (10.64)	11.85 (12.77)	12.56 (11.67)	.522	.668	142
Total Canceled Outpatient	6.62 (12.70)	4.29 (3.63)	4.00 (3.91)	4.46 (5.30)	.776	.509	142
Total No Show Outpatient	2.15 (2.92)	3.14 (3.19)	2.46 (2.87)	2.53 (3.53)	.480	.697	142
Primary Care Completed	8.33 (5.87)	8.14 (6.45)	7.15 (8.21)	7.35 (4.67)	.339	.797	142
Primary Care Canceled	2.94 (3.46)	1.90 (1.78)	1.54 (1.76)	2.26 (2.60)	1.32	.270	142
Primary Care No Show	1.23 (1.96)	1.57 (1.72)	.92 (.760)	1.39 (1.62)	.455	.714	142
Specialty Care Completed	5.25 (11.38)	3.86 (6.38)	2.85 3.53)	3.98 (7.88)	.353	.787	142
Specialty Care Canceled	3.19 (10.57)	1.48 (2.52)	1.62 (2.18)	1.95 (3.62)	.482	.695	142
Specialty Care No Show	.65 (1.13)	1.05 (1.56)	1.23 (2.12)	.95 (2.11)	.564	.640	142
Behavioral Health Completed	1.10 (2.64)	1.14 (2.26)	1.69 (3.68)	1.00 (3.12)	.203	.894	142
Behavioral Health Canceled	.44 (1.09)	.71 (1.38)	.85 (2.15)	.19 (.833)	1.70	.168	142
Behavioral Health No Show	.19 (.658)	.52 (1.56)	.31 (.855)	.19 (.611)	.907	.440	142
Total Hospitalizations	.76 (2.15)	1.00 (2.30)	.31 (.480)	.66 (1.26)	.441	.724	146

Table 12

Healthcare Utilization, Psychosocial, and Relationship Style (Type III Analysis)

	Hospitalizations			Primary Care		Specialty Care		Behavioral Health		HbA1c	
	df	Wald Chi-Square	Sig	Wald Chi-Square	Sig	Wald Chi-Square	Sig	Wald Chi-Square	Sig	F	Sig
Gender	1	.453	.501	.422	.516	.344	.558	1.75	.185	2.59	.110
AA	1	1.53	.216	.094	.759	4.79	.029*	.157	.692	.617	.434
Relationship Style	3	1.77	.622	5.03	.169	1.46	.690	3.43	.329	1.98	.120
PHQ-9	1	1.64	.200	5.17	.023*	.119	.730	2.62	.106	.276	.600
Dunst-Factor 1	1	.103	.748	.260	.610	2.44	.118	.706	.401	1.42	.235
Dunst-Factor 2	1	3.95	.047*	1.30	.254	4.21	.040*	1.49	.222	.001	.972
Dunst-Factor 3	1	.000	.991	.000	.982	4.00	.045*	.105	.746	.249	.619
	1	.595	.440	1.85	.173	4.91	.027*	2.19	.139	4.69	.032*
Emotional Burden	1	.973	.324	.040	.841	2.28	.131	.492	.483	.686	.409
Physician Related	1	4.96	.026*	.684	.408	.073	.787	.343	.558	.025	.874
Regimen Related	1	2.76	.096	.550	.458	.721	.396	.774	.379	2.35	.128
Interpersonal	1	.084	.772	.000	.994	.600	.439	2.79	.095	2.15	.145
DES-1 Change	1	.914	.339	5.22	.022*	1.44	.229	4.08	.043*	.005	.946
DES-3 Obstacles	1	1.99	.158	2.39	.122	6.63	.010*	6.67	.010*	3.40	.068
DES-4 Ask for Help	1	.094	.759	1.09	.296	.532	.466	.014	.906	2.52	.115

*Indicates significance, *p*<.05

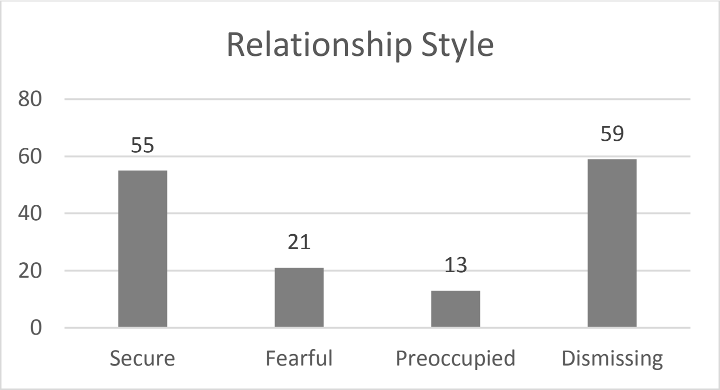

Figure 1. Relationship style for study participants (N=148).

SECURE ATTACHMENT N=55 39 females/16 males 37 AA/18 Not AA 30 Medicaid/Medicare 25 Married	PREOCCUPIED ATTACHMENT N=13 7 females/6 males 9 AA/4 Not AA 10 Medicaid/Medicare
DISMISSING ATTACHMENT N=59 33 females/26 males 47 AA/12 Not AA 47 Medicaid/Medicare 22 Married	FEARFUL ATTACHMENT N=21 13 females/8 males 13 AA/8 Not AA 15 Medicaid/Medicare 7 Married

Figure 2 Rural Sample-Demographics

CHAPTER FIVE: IMPLICATIONS AND RECOMMENDATIONS

The aim of this dissertation was to explore diabetes mellitus (DM) and healthcare utilization patterns through the theoretical foundation of attachment (Bowlby, 1969, 1973, 1980). The intent was to better understand the biopsychosocial ([BPS] Engel, 1977, 1980) chronic illness experience of patients with DM who reside in a rural, underserved area. Chapter Two synthesized and presented outcomes from a systematic review of the relevant literature across the areas of attachment theory, healthcare utilization, and DM. In Chapter Four, a cross-sectional study was conducted to help address the gaps in the literature revealed from Chapter Two. The study involved collection and analysis of BPS (i.e., HbA1c, depression, distress, social support) and relationship style data to facilitate the creation of unique patient summaries with a rural patient sample. Additionally, outpatient primary care (PC), specialty, behavioral health, and inpatient utilization rates were examined by relationship style to determine if differences could be observed. This chapter was designed to draw on the outcomes of Chapters Two and Four to highlight implications and offer recommendations to advance the research, clinical practice, health care policy in this area of inquiry, as well as for the field of Medical Family Therapy (MedFT).

Before moving into addressing research, clinical, and policy recommendations, a brief overview of the meaning and importance of integrated care (IC) will be addressed. IC provides a venue for the delivery of biomedical and psychosocial care as a comprehensive service to patients with DM that is inclusive of the BPS domains of health, several of which have been studied here. Because IC has been widely defined, it is important for consumers of research to differentiate, and decide on the most appropriate course or level of collaboration in research and clinical arenas (Blount, 2003). Representative of varying levels of medical and behavioral provider collaboration are integrated, co-located, and coordinated care; terms often used synonymously yet are paradigm shifting concepts along a spectrum of biomedical and psychosocial care (Doherty, McDaniel, & Baird, 1996). Early on collaborative care (CC) was defined by five levels ranging from patients having different providers who basically operated in silos, to more of a shared approach to care demonstrated by referrals, all the way to medical and behavioral health providers caring for patients side-by-side (Doherty et al., 1996; Seaburn, Lorenz, Gunn, & Gawinski, 1996).

In the most integrated level, providers not only are in the same physical setting, they document patient interactions in the same system, and work together to create a plan of care to address physical as well as emotional issues (Doherty et al., 1996). In a summary of the evidence, Blount (2003) reminded readers that PC is the discipline that sees those patients suffering from chronic disease processes struggling with necessary behavioral changes, and is the appropriate setting to address both needs simultaneously. Blount (2003) stated "Integrating behavioral health services into primary care is an idea whose time should have already come" (p. 122). The acknowledgement of the co-existence of biomedical and psychosocial issues has brought IC to the forefront of PC, but there is more work to be done.

Research has shown IC to be effective and efficacious among targeted populations (Banerjee & Chaudhury, 2010), with specific interventions, and a clearly defined relationship between medical and behavioral providers (Blount, 2003). In application, seven guiding principles have been included as pillars of the Patient-Centered Medical Home (PCMH): (a) continuity of care with a provider; (b) team care lead by a trained physician; (c) physician lead care across the life-span; (d) reduction in duplicative and improper care through coordination and/or integration; (e) use of technology and evidence-based guidelines to ensure safety and quality; (f) access to care; and (g) a financial system with reimbursement strategies to support the aforementioned principles (AAFP, AAP, ACP, & AOA, 2007; Edwards, Patterson, Scherger, & Vakili, 2014; Rosenthal, 2008). Building on the PCMH are the newly published *Joint Principles: Integrating Behavioral Health Care into the Patient Centered Medical Home*, endorsed by the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP), the Collaborative Family Healthcare Association (CFHA) and the American Psychological Association (APA), among many others acknowledging and publically supporting the notion that in order for care to be of sufficient quality, the PCMH must include the integration of behavioral health care as part of the practice of PC (The Working Party Group on Integrated Behavioral Healthcare, 2014).

In spite of consensus regarding the importance of IC and the PCMH, in conjunction with the highly publicized study on quality care and recommendations by the Institute of Medicine (IOM, 2001) in *Crossing the Quality Chasm*, patients continue to be plagued by the morbidity and mortality of chronic conditions like DM (Kirk et al., 2011). So many of the necessary behavioral changes rely on relational interactions between motivated and empowered patients with access to care; a continuous positive patient-provider relationship; and the appropriate use of research findings through evidence-based clinical guidelines. This chapter will help to expand on what can be done with regard to better integrate care for rural underserved patients with DM. The following recommendations will highlight possibilities for change in the research, clinical, and policy arenas, as well as in the overall field of MedFT drawing upon the included studies and the literature.

Research Implications

Based upon the research presented in article one (Chapter Two) and article two (Chapter Four), recommendations for future investigative focus will center on: (a) attachment-based interventions and strategies for healthcare providers; (b) the need for effectiveness studies regarding implementation and outcomes of attachment-based interventions with DM patient populations; (c) expansion of understanding surrounding the role of patient-provider relationship and attachment styles in the care process; and (d) a call for more consistent application of attachment theory to patients with type I DM and their caregiving system. Prior to extending specific research recommendations, a brief summary of available research on attachment interventions and strategies in healthcare provides a foundation on which further investigators can expand and enhance the science.

Operationalization of Attachment Interventions

Moving beyond descriptive emotional characteristics of relationship styles (Bartholomew & Horowitz, 1991) and healthcare utilization patterns (Ciechanowski et al., 2004), toward operationally defining how together medical and behavioral health providers may apply attachment theory to patient care is an area in need of more research. Now that a demographic (see Chapter Four, Table 8), psychosocial (see Chapter Four, Table 9), and utilization summary (see Chapter Four, Table 11) by attached style has been presented for a small rural sample more information is needed to know how best to translate these findings into patient care. For example, more studies are needed with rural populations that examine how relationship styles can be used to create IC plans for patients with DM to better understanding what types of interventions could be deployed to improve the patient-provider relationship as well as care plan adherence particularly with diverse patient samples. In similar fashion to the attachment theory based steps and stages of Emotionally-Focused Therapy (EFT) (Johnson & Greenberg, 1985), a manualized approach is needed to assist providers in successfully interacting, intervening, and supporting patients in the management of their chronic disease.

Researchers who initiated this work have found secure patients are better able to enter in and maintain a collaborative, trusting relationship with a healthcare provider (Ciechanowski et al., 2004); are more adherent to a medical regimen; and have the ability to navigate a complex health system (Ciechanowski, Russo, Katon, Von Korff, et al., 2006; Ciechanowski & Katon, 2006). In contrast, those with less secure relationship styles (i.e., preoccupied, fearful, dismissing) endorse having more difficulty with collaboration and oftentimes have significant health complications (Ciechanowski et al., 2010; Ciechanowski, Katon, Russo, & Walker, 2001). Preoccupied patients have been found to have higher rates of health symptom reporting and healthcare utilization (Ciechanowski, Hirsch, Katon, 2002; Miller, 2008). Those with a fearful style also have high rates of symptom reporting, but tend to utilize more same day or urgent types of health care, rather than preventive appointments (Ciechanowski, Russo, Katon, Simon, et al., 2006). Fearful style patients have also been found to be overly sensitive to the power differential between themselves and providers, keenly aware of rejection, as well as hesitant to change providers (Ciechanowski & Katon, 2006). Lastly, dismissing patients tend to rely more heavily on themselves rather than a healthcare provider, symbolizing a lack of trust of others (Ciechanowski et al., 2004).

For all relationship styles it has been recommended that providers be educated about attachment styles to obtain a general understanding of how patients form and preserve personal relationships (Ciechanowski et al., 2002; Ciechanowski, Russo, Katon, Von Korff, et al., 2006). With an awareness of attachment, there may be “greater empathy and less frustration among providers who find themselves in difficult patient-provider relationships" (Ciechanowski et al., 2002, p. 665).

The findings described in Chapter Four provide an alternative view to attachment with a predominantly African American (AA) sample, and differences not only in the percentage of each attachment type, but in the psychosocial assessments completed by patients and healthcare utilization rates in outpatient and inpatient settings. AA patients in the study reported feeling empowered, yet most fell in the dismissing category of attachment. Perhaps it is the way the measures were worded or the uniqueness of a rural lower socioeconomic (SES) patient population that lead to an unexpected relationship between empowerment and dismissing types. Another hypothesis could be that this particular sample of dismissing patients felt empowered to manage their DM with less continuous health care and could be an alternative way of viewing non-compliance. This warrants further investigation.

Gender and race also provide an interesting depiction. Of the 148 patients, 72% (N=106) were AA, and 86% (N=92) were female. The sample included 45% (N=67) AA, females. Females of both races reported more emotional burden, while AAs reported more physician related distress. Preoccupied patients, who normally are high utilizers of care actually used the least amount of care, so there is much more to learn from this under-represented group.

Secure patients actually used the most healthcare, followed by fearful, and then dismissing styles. Since this was the first look at a majority AA sample the data implies that not only are the attachment styles distributed differently, healthcare utilization rates vary as well. The questions needing to be answered are: Why are secure patients using more primary and specialty care? Are they using more than they should? Do we need to find better ways to engage fearful and dismissing types (e.g., technology, patient portals, care coordinators)?

Patient-Provider Attachment Styles and Relationship Histories

Prior attachment research with patients has shown in times of low patient-provider collaboration there tend to be more missed appointments (Ciechanowski, Russo, Katon, Simon, et al., 2006), and less of a therapeutic alliance, or “the collaborative and affective bond between professional and patient” (Morris et al., 2009, p. 585). Because the patient-provider relationship is a reciprocal one (Ciechanowski et al., 2001; Thompson & Ciechanowski, 2003), provider attachment styles and their impact on the overarching patient-provider relationship is yet another area calling for additional research and correlates with the idea of a positive therapist-client environment (Bernier & Dozier, 2002; Dozier, Cue, & Barnett, 1994).

The ability of providers to care for patients of all relationships styles is critical for healthy outcomes, yet it can be difficult to form and maintain appropriate relationships with insecurely attached patients. Consistent yet flexible care, boundary setting, integration of behaviorists, and more communication or reminders have all been discussed as possible solutions to build positive patient-provider relationships (Thompson & Ciechanowski, 2003). As mentioned previously, this body of research has focused on physician providers, however patients are often cared for by a team of healthcare providers including nurses, ancillary providers, behaviorists, and educators so awareness of relationship styles may help establish and maintain quality relationships between patients and providers as well as among the team.

As part of the patient-provider constellation, the role of the patients’ relationship style and their relationship history are important. Chapter Four highlighted that the highest averages of social support came from extended family and friends, rather than parents and partners, or community and medical support (see Table 4). This was true for gender, race, marital status, and insurance status. A more in-depth interview style assessment that captures the cultural uniqueness of communities and their biases and beliefs about health and the healthcare system could provide useful knowledge when working with patients with DM in a rural area.

Attachment and Type I DM

Lastly, as evidenced by the reviewed articles in Chapter Two (see Table 2), the attachment literature has been dominated by patients with type II DM. More attachment based research is needed with type I patients (Ciechansowski et al., 2002), and their families (i.e., family centered care) to explore family system dynamics as well as transitions or interfaces of care from pediatrics to adult care with internal or family medicine physicians and their care teams (Peters, Laffel, ADA Transitions Working Group, 2011). Empirically-based interventions like in-home multisystemic therapy (MST) with type I DM patients and the impact on glucose monitoring and healthcare utilization (Ellis, Naar-king, et al., 2005; Ellis, Templin, et al., 2005) is one area that has shown success with adolescents and is in need of more research to study if effects are long-term and cost effective. Emergent and inpatient hospitalization rates for diabetic ketoacidosis (DKA) were reduced, therefore impacting healthcare costs, however further exploration of the relational aspects of care and styles among family members and providers would be an important next step in this research.

Along a similar research trajectory is the exploration of attachment styles and social support among couples with one partner having DM, type I or II, and the implications on the family unit (Cohen et al., 2005; Feeney & Ryan, 1994). For example, it would be helpful to better understand not only the attachment style of the patient, but that of their partner/spouse and healthcare providers to examine patterns of literal and metaphorical distancing behaviors found to be detrimental to management of DM (Cohen et al., 2005). The research recommendations noted above are all designed for a practice-based setting. Advancements in understanding attachment styles and one’s approach to one’s health care experience have powerful ramifications for clinical practice.

Clinical Implications

Research and evidence-based interventions should inform clinical recommendations. It is crucial to prioritize with the BPS model in mind (Engel, 1977, 1980), and include the patient’s social support system (Ognibene & Collins, 1998). The following clinical recommendations are extended from the systematic review (Chapter Two) and research outcomes (Chapter Four) presented in this dissertation: (a) education and application of attachment theory in health care settings for patients, families, healthcare providers, and healthcare teams; (b) a time sensitive or efficient assessment of relationship style that is easily interpreted by patients of varying educational levels which can be utilized in the outpatient or inpatient setting; and (c) the adaptation of the patient navigator model (used among cancer patients) for patients with DM.

Attachment Theory and Health Care Settings

Provider education about attachment, along with a broadening of the care team to include ancillary and behavioral providers, could establish a model of patient-centered IC for patients with DM that is respectful of and provides a venue in which to apply research on attachment styles. Patients with certain insecure relationship styles (i.e., dismissing, fearful) tend to avoid going to their primary care provider, and instead use emergent care paths, because of attachment or relationship issues, or the need to maintain distance between themselves and others for example (Ciechanowski et al., 2010). This has resulted in additional hospitalizations rather than a continuous provider-patient relationship that includes self-management guidance and close monitoring of health outcomes (Ciechanowski, Russo, Katon, Simon, et al., 2006; Ciechanowski et al., 2002). Attachment theory provides an avenue from which to look at clinical process options to help those patients who may be labeled as non-compliant to determine if viable options are in place for them or if additional resources need to be identified.

One way to address non-adherence and over utilization of health care is to integrate patient-centered support (e.g., care coordinator or nurse case manager). A collaborative patient-centered intervention has been shown to be effective, with less secure patients, particularly those with dismissive or fearful attachment styles with DM and depression (Ciechanowski, Russo, Katon, Von Korff, et al., 2006). Essential aspects of care included the ability to establish and build more secure relationships; engage in healthy productive behaviors to manage diabetes effectively; allow for open communication so patients can share personal circumstances that may hinder their management strategies; have an awareness of their non-verbal communication; and take time during appointments to address patient questions. “Interpersonal validation and a sense of safety must be attained before adequate treatment adherence, optimal health care utilization patterns and effective self-management” are useful for insecurely attached patients (Ciechanowski & Katon, 2006, p. 3077). Behavioral health providers could play a role in facilitating a patient-centered approach and in assessing and modifying treatment plans in consideration of each patient’s, and provider’s, relationship style. Based upon the lack of behavioral health utilization in the rural sample (see Chapter Four, Table 11), a more integrated or collaborative care model may be more easily accepted and accessible to patients. Removing the stigma, by establishing a standard of psychosocial health simultaneously intertwined with biomedical chronic disease management, would allow for relational issues to be made a part of care (World Health Organization [WHO], 2008).

Assessment of Relationship Style in Health Care

The PCMH (Bojadzievski & Gabbay, 2011; Kathol, deGruy, & Rollman, 2014; Peikes et al., 2014), and the Chronic Care Model (CCM) (Wagner, 1998) exemplify the integration of PC medicine with behavioral health to improve health outcomes (Ciechanowski et al., 2010; Wysocki et al., 2006) among patients with DM (Stellefson, Dipnarine, & Stopka, 2013). With dedicated resources, an integrated behavioral health care approach could support the efficient assessment of relationship styles and build upon published literature toward an evidence-based assessment tool appropriate for a health care setting (e.g., outpatient or inpatient care). To date, it has been difficult to surmise findings because attachment styles are often measured differently across studies (e.g., interview, questionnaire).

Ravitz, Maunder, Hunter, Sthankiya, and Lancee (2010) published a twenty-five year review of the measures of adult attachment and stated “the importance and relevance of attachment to clinical populations in psychosomatic medicine is an exciting research frontier” (p. 428). Barriers to the efficiency include interview options requiring training prior to use (e.g., Adult Attachment Interview [AAI]); instruments ranging from thirty to sixty items and requiring a significant amount of time to administer, which is a challenging characteristic in busy healthcare practices; and the need for additional time and personnel resources to score instruments (Ravitz et al., 2010).

Based upon personal communication (D. M. Cummings and C. L. May, October 9, 2013) another consideration is the interpretability of the instrument and the educational level of the patients completing it. In Phase Two of the research study described in Chapter Four, some patients reported difficulty in reading and comprehending all four descriptive paragraphs on the Relationship Questionnaire (RQ) (Bartholomew & Horowitz, 1991), and deciding on the one most like them. When assessing attachment with the RQ, subjects are initially asked to read four descriptions, each two-three sentences long, and then check the one that sounds most like them. Then they are to indicate their level of agreement on a 7-point scale to each of the four descriptions. For now the recommendation would be to use the Relationship Scales Questionnaire (Griffin & Bartholomew, 1994). Although it is longer (30-items), it may be more easily interpreted by patients with less education. Ideally a measure of attachment designed for clinical settings would be developed for use with diverse patient populations.

Assessing for social support (Ognibene & Collins, 1998) and distress (Baek, Tanenbaum, & Gonzalez, 2014) in parallel with attachment would provide a more holistic and systemic perspective of the patient, and could acknowledge the supportive role of providers. This was found to be the case in this cross-sectional study where social support, distress, and attachment were included in the analyses. Having the ability to look at the sample from multiple angles provided a more holistic picture and allowed for a biopsychosocial depiction of an AA sample of patients with DM living in a rural area. With all of the variables it allowed the lens to show healthier patterns than previously described. Overall the sample reported positive social support, empowerment, and health perceptions, as well as low levels of depression and distress as compared with earlier findings of high levels of depression among patient with DM (Egede, 2006; Egede, Zheng, & Simpson, 2002).

From this, additional recommendations for clinical practice could include the integration of a Medical Family Therapist (MedFT) (Hodgson, Lamson, Mendenhall, & Crane, 2012; McDaniel et al., 1992, 2014). MedFTs could help to assess for and distinguish between psychosocial issues of distress, anxiety, and/or depression (Fisher, Glasgow, Mullan, Skaff & Polonsky, 2008), and then use the above mentioned interventions to cope with interpersonal, emotional, physician or regimen related struggles in addition to psychosocial concerns. This could help to further distinguish DM related distress from mood or anxiety disorders.

Care Coordination and Patient Navigation

Patients often suffer from multiple chronic disease states, and have an essential need to receive care not only from primary care providers (PCP), but from specialists as well. However, the healthcare research agenda is often focused upon a single disease process influencing the clinical world to narrowly focus on the linear progression of chronic disease rather than a systemic perspective of the patient, family, and environment (Bayliss et al., 2014). Chapter Two included a section on outpatient and inpatient healthcare utilization and in it highlighted the complexity, fragmentation, and costly expenditures present within our healthcare system. Many of the researchers' work reviewed under this theme either found patients with DM were high utilizers of health care and in turn had higher healthcare expenses (Chin, Zhang, & Merrell, 2000; Ciechanowski, Russo, Katon, Simon, et al., 2006; Kim & Boye, 2009; Maciejewski & Maynard, 2004), or that they received suboptimal care with low utilization rates (Fenton, Von Korff, Lin, Ciechanowski, & Young, 2006). Expensive inpatient admissions or readmissions for patients with DM have been linked to higher HbA1c values (Kim, Ross, Melkus, Zhao, & Boockvar, 2010; Menzin et al., 2010), as well as co-morbid disease states (Westert, Lagoe, Keslimaki, Leyland, & Murphy, 2002), leading to the scrutiny of quality, timely, and accessible outpatient care.

A PCP coordinating an increasing amount of specialty care has been found to negatively impact continuity among patients with multiple chronic disease conditions like DM and coronary artery disease (CAD), but stakeholders (e.g., providers, patients and organizations publishing standards of care) have recognized the need for and importance of a model to do so well (Liss et al., 2011). Someone is needed at the interfaces of care which include the transitions between PC and specialty, as well as inpatient to outpatient care. The specialty of oncology provides a patient navigation model of care (Braun et al., 2012; Howitt, 2011) focused on the reduction of health disparities (Calhoun, 2010), which could serve as a model for DM patients, specifically in terms of managing the complex and fragmented healthcare system through a shared decision making model (Barry & Edgman-Levitan, 2012), by enveloping the above mentioned attachment based care strategies.

Terms and definitions vary between family care coordinator (Howitt, 2011), nurse navigator (Campbell, Craig, Eggert, & Bailey-Dorton, 2010) and patient navigator, but an accepted description states navigators are “health care professionals or highly trained outreach workers that coordinate health care for patients and assist them in navigating health care systems” (Calhoun et al., 2010, p. 207). In oncology four outcome measures are used to determine effectiveness: (a) amount of time to diagnosis; (b) amount of time to treatment; (c) patient satisfaction; and (d) cost effectiveness (Campbell et al., 2010; Freund et al., 2008). Contributions to the research literature have been conducted by The National Cancer Institute through the Patient Navigation Research Program within the Center to Reduce Cancer Health Disparities (Freund et al., 2008). The outcome measures could build upon the role of certified diabetes educators (CDE) who not only teach patients the knowledge they need to learn about DM, but assist them in determining risks, motivating toward behavior change, and serving as part of a social support system by being culturally aware and open-minded (Kent et al., 2013). This role has been found to increase patient and provider satisfaction, and as an effective way of eliminating barriers to care (Campbell et al., 2010).

Not unlike patients with DM (Chin, Zhang, & Merrell, 1998; Peek, Cargill, & Huang, 2007), health disparities exist among minority cancer patients who live in rural areas (Calhoun et al., 2010; Haynes & Smedley, 1999). With the theoretical foundation of the cancer care continuum (Abrams, 2007) and the five A's (accessible, affordable, available, appropriate, and accountable) of quality care (Penchansky & Thomas, 1981), Braun et al., (2012) highlighted a variety of navigation programs from across the country that have helped to define the role of a patient navigator as someone who provides inclusive, culturally-relevant, and patient-centered support throughout the disease process. Similarly, Howitt (2011) supports the inclusion of education, information and resources, and ongoing communication between providers and families provided by care coordinators or patient navigators. In a study with diabetic Hispanic patients with comorbid depression, an intervention model including patient navigation was successful in reducing depressive symptoms; improving depression medication adherence; and significantly increasing the length of time patients participated in problem-solving therapy (Ell et al., 2010).

The populations patient navigators work with to reduce disparities were consistently described in the literature; however, the settings in which navigators reside and disciplines who provide this level of care was an element of care not reliably addressed in the literature. There is a need for MedFTs to assist patients in moving between outpatient primary or specialty care to the inpatient setting in support of continuity independent of location. In an article authored by Harrington, Kimball and Bean (2009) focused on childhood cancer, the role of a MedFT was explored and touted as one prepared with the knowledge, skills and awareness to help families in this difficult situation. The study specifically discussed the likelihood of MedFTs working in a hospital setting with childhood cancer patients and their families, and the importance of knowledge and comfort with an inpatient setting (Harrington et al., 2009).

Focusing on those patients who have high rates of outpatient utilization and multiple hospital admissions provides one way of prioritizing for whom patient navigation may be most beneficial. As mentioned in the research recommendation section, patients with type I DM tend to suffer from DKA (Ellis, Naar-King, et al., 2005; Ellis, Templin, et al., 2005b), have higher hospital readmission rates and therefore higher costs (Maldonado, Chong, Oehl, & Balasubramanyam, 2003), and may be more likely to suffer from depression or anxiety (Liss et al., 1998; Silverstein et al., 2005) so may benefit from a navigation model focused on care coordination and the use of supportive therapeutic interventions (e.g., motivational interviewing) (Elwyn, Dehlendorf, Epstein, Marrin, White, & Frosch, 2014). These issues highlight the need for further clarification in order for third party payers to reimburse providers for this work (Freund et al., 2008), and draws attention to the third area of implication and recommendations within this dissertation - policy.

Policy Implications

The “triple aim of health reform - better health, improved patient experience, and more affordable costs - is dependent on a foundation of high-performing primary care” (Bodenheimer, Ghorob, Willard-Grace, & Grumbach, 2014, p. 166). The Triple Aim cogently correlates with Peek’s three-world view which states systems of care must consider the clinical, operational, and financial aspect of health care (Peek, 2008). One way to operationalize what is meant by “high-performing primary care” is to look to the six “building blocks” (i.e., patient-team partnership, population management, continuity of care, prompt access to care, comprehensiveness and care coordination, and template of the future), stacked on to Starfield’s Four Pillars of Primary Care (i.e., engaged leadership, data-driven improvement, empanelment, and team-based care) (Bodenheimer et al., 2014; Starfield, 1998;).

The attributes mentioned above are apparent in a recent publication written together by family physicians from across the country working together to construct the following definition of family medicine:

> Family physicians are personal doctors for people of all ages and health conditions. They are a reliable first contact for health concerns and directly address most health care needs. Through enduring partnerships, family physicians help patients prevent, understand, and manage illness, navigate the health system and set health goals. Family physicians and their staff adapt their care to the unique needs of their patients and communities. They use data to monitor and manage their patient population, and use best science to prioritize services most likely to benefit health. They are ideal leaders of health care systems and partners for public health (Phillips et al., 2014, p. 250).

The applicability of this definition of family physicians to primary health care practices is apparent. With so many health care components described, one could surmise a need for healthcare systems and providers to initiate and implement policy that not only clinically, but operationally and financially support the interfaces between primary care and the litany of specialists some patients with DM must coordinate (i.e., ophthalmology, endocrinology, cardiology) (Liss et al., 2011).

Clinical

Awareness and support of the effectiveness of care coordination for patients with DM is crucial (Norris et al., 2002). Having the dedicated time, integrated staffing, and reimbursement for outcomes based care, rather than focusing exclusively on volume of care (Kathol et al., 2014;

Peikes et al., 2014) could enhance quality biomedical and psychosocial IC health. Particularly in terms of addressing health disparities, the role of patient-centered care and policy is an important one. According to Epstein, Fiscella, Lesser and Stange, (2010) "health policy should also promote programs that encourage patients and families to be more effectively involved in care through information, coaching, navigation or the health care system, and advocacy" (p. 1492).

Integrating the assessment of attachment as a standard operating procedure, and applying the information to an IC plan of care could (a) accelerate the joining process between patient and provider with sensitivity towards those who may need more care and a validation of those who would prefer to manage their DM with more autonomy; (b) help to establish a positive and supportive patient-provider relationship as a framework to understand and recommend useful management strategies (Chapter Two); and (c) help providers to better understand patients in terms of their relationships. Based upon the high levels of empowerment reported by patients in the study sample (Chapter Four) one would hope that patients are provided with the opportunity to be actively engaged in their healthcare decisions and plans, however the addition of an attachment assessment for health care settings could help to insure this.

Operational

The need for clinical practice guidelines for multiple chronic disease conditions was highlighted during a meeting of experts from the IOM, the Department of Health and Human Services (DHHS), and academia (Goodman et al., 2014). The resulting publication summarized the principle outcomes which included the ability to (a) develop and utilize guidelines from multiple organizations for multiple chronic disease processes; (b) build more content on diagnostic, treatment and management options including care coordination; and (c) have the care patient-centered. Unfortunately there was no mention of comorbid emotional or psychological conditions. We have more and more citizens struggling with comorbid conditions (Ward & Schiller, 2010), particularly those over the age of 65 (Centers for Medicare & Medicaid Services [CMS], 2011), yet the research that drives clinical and policy related decisions remains focused on single disease processes (Peek, Baird, & Coleman, 2009).

Systemic, or contextual issues as Bayliss et al. (2014) described them, impact the health of patients with multiple chronic diseases, and as discussed throughout this dissertation there continues to be a clear need to simultaneously address biomedical and psychosocial factors. Because so often patients are receiving their mental health care in a primary care setting, operationally the flow of the system needs to accommodate with more time, space for patients and providers to talk without interruption, and personnel with a level of expertise to address psychosocial needs (Hodgson, Fox, & Lamson, 2014). Specifically this could mean policy for funding of care coordinators to engage with the fearful and preoccupied types, while remotely maintaining continuity with dismissing types.

Financial

In Chapter Two comorbid depression was often referenced as a barrier to medication adherence, positive behavior change impacting self-care and DM management, and an underlying cause of excessive healthcare utilization. Without the proper acknowledgement, through reimbursement for the screening and IC treatment of psychosocial stressors, patients will continue to struggle with chronic disease management and potentially suffer physically and emotionally. MedFTs could partner with providers to fulfill the goals of the Triple Aim by establishing clinical partnerships and joining interdisciplinary teams. They could share the foundations of the field including systems theory (Von Bertalanffy, 1968), the biopsychosocial-spiritual ([BPSS] Engel, 1977, 1980; Wright, Watson, & Bell, 1996) model as well as design and facilitate educational seminars on attachment theory's specific application to health care settings.

Transitions from inpatient to outpatient care are also essential and have begun to be recognized with new care coordination and chronic disease management codes (Bloink & Adler, 2013). Staffing practices, or the optimal team, need to be defined for different practice sizes to include the elements of the PCMH due to disappointing findings from one study that showed only 41.7% of recognized PCMHs had care coordination although it is a recognized attribute (Peikes et al., 2014). Payment for services versus payment for outcomes hinders the inclusion of health education, behavioral health, care coordination, nutrition and medication adherence monitoring (Peikes et al., 2014).

According to Blount et al., (2007), "it is in the area of behavioral health that the U.S. health care system could find the largest potential payoff in reduction of morbidity and mortality and the largest increase in the cost-effectiveness of care" (p. 291). A large percentage of mental health issues are present in primary care (Roca et al., 2009), although in many cases are not assessed for or treated properly (Kessler et al., 2005). This is particularly true of more serious mental health diagnoses among lower SES or minority groups (Dewa, Tugg, Stergiopoulos, Ghavam-Rassoul, & deRuiter, 2012).

Cost is often exposed as the very first hesitation to incorporating a MedFT, based on a lack of reimbursement from government and private insurers. Although there are up front expenditures necessary for the integration of behavioral health specialists, cost savings have been shown to take effect over time with a decrease in healthcare utilization (Crane, 2011). As Chapter Two discussed, high utilizers of care with DM often are experiencing comorbid mood or anxiety disorders, which increase their use of health care. Although the average PHQ-9 score for depression in this dissertation’s cross-sectional study (Chapter Four) was low (5.86), 21% were at or above the cut off score of ten indicating mild to moderate depression. Higher rates of outpatient and inpatient utilization were found among those patients, supporting the need for integration of psychosocial alongside physical health care.

Medical Family Therapy Implications

Engel’s (1977, 1980) critique of the biomedical model and support of the model BPSS (Wright, Watson, & Bell, 1996) model continues to be a powerful influence along with systems theory (Von Bertalanffy, 1968) in building MedFT as a contributing member to the research landscape and a recognized therapeutic field that helps patients and their families cope with the stress of an acute or chronic illness (McDaniel et al., 2014; McDaniel et al., 1992). Initially McDaniel et al. (1992) defined MedFT as the “biopsychosocial treatment of individuals and families who are dealing with medical problems” (p. 2) however, more recently the same group of founding MedFTs have defined it as a field (McDaniel et al., 2014). The Delphi study conducted by Tyndall, Hodgson, Lamson, Knight, and White (2010) defined MedFT as:

> An approach to healthcare sourced from a BPS-S perspective and marriage and family therapy, but also informed by systems theory. The practice of MedFT spans a variety of clinical settings with a strong focus on the relationships of the patient and the collaboration between and among the healthcare providers and the patient. MedFTs are endorsers of patient agency and facilitators of healthy workplace dynamics (p. 68-69).

Regardless of how one defines MedFT, agency and communion are core components that help families to realize they have options and choices when attempting to navigate an extraordinarily complicated health care system (McDaniel et al., 1992).

Agency, or the expectation of patients playing an active role in their own health care can include decision-making, communicating with providers to gain knowledge, setting clear boundaries with family members, or being empowered to ask questions of health care providers (McDaniel et al., 1992). Patients must be their own advocates, and guide their care in a proactive manner (McDaniel, Campbell, Hepworth, & Lorenz, 2005). Communion is the emotional side of illness or disability, and the feelings of being cared for by the health care system and family members.

Agency and Communion

An important component to the success of agency is patient education and providing the appropriate information so that patients can make their own choices for their care (McDaniel et al., 2005). Doherty and Mendenhall (2006) described several examples of this on a community level in their research on citizen health care. Citizen health care advocates for patients to be active participants in their health care along with community members to make a difference. The Partners in Diabetes (PID) program created by Doherty and Mendenhall, in conjunction with patients and community members, is an example of a citizen led advocacy based project. Patients and their partners were charged with the design and implementation of a supportive, patient-centered project. Support partners who were in good control of their DM were paired with patients who had elevated HbA1c levels. They spent time together discussing challenges, which resulted in positive lifestyle changes and better clinical outcomes. The patients had a voice in their care and how it was delivered. This empowered them over their disease and allowed them to integrate culturally sensitive solutions resulting in health behavior change.

Support groups are a source of communion in addition to MedFTs (McDaniel et al., 1992). Accepting and coping with an illness or disability can be challenging for the individual and their family members. Communion is a concept that realizes the importance of nurturing supportive relationships, and forgiving past hurts (McDaniel et al., 2005). In the PID program, partners of patients with DM were chosen as the source of support. Patients had a support system in place, and the partners had a role they could fulfill in helping to care for the person with DM (Doherty & Mendenhall, 2006). MedFTs have the ability to clinically work with clients to integrate these concepts (i.e., systems, collaboration, biopsychosocial-spiritual, agency and communion) and facilitate a process of self and relational exploration which hopefully results in stronger, more secure relationships among families.

Agency and communion are particularly important to those facing barriers to care as described in Chapter Two (i.e., geographic location, insurance status), as well as those patients with attachment styles that are less empowered (i.e., fearful) and a have less social support (i.e. dismissing) as see in Chapter Four. Within the rural sample, those with less empowerment tended to be males, not AA, and divorced or separated. Similar findings were present for social support. Males and those who were not AA had slightly less social support; however for marital status there was more variability with those who were divorced, widowed, or never married having less. MedFTs are trained to clinically work with patients and their families as an advocate, but to essentially empower them to become active participants in their health care.

Medical Family Therapy Core Competencies

The training of MedFTs needs to include not only an awareness of the political landscape, but the skills to contribute to it as a representative of BPSS care with findings based on evidence. Building upon the foundation of systems theory, the BPSS model, agency, and communion specific to this dissertation leads to a final discussion of MedFT core competencies in two broad categories: knowledge and skills (Tyndall, Hodgson, Lamson, White, & Knight, 2012). Supporting patients with DM, their families, and healthcare providers is a wonderful application of family systems theory (Von Bertalanffy, 1968) and the BPSS model (Engel, 1977, 1980; Wright et al., 1996). As shown throughout the dissertation, DM is a chronic disease that has obvious biomedical components, yet psychosocial elements are ever present. Research is still needed to explore effective patient-centered interventions.

MedFTs need the clinical skills to provide therapy in an ethical and culturally sensitive way to individuals, couples, or families in an outpatient primary care setting or an inpatient facility. Using the findings from this dissertation, MedFTs will be able to strengthen their clinical, research and policy evidence that endorses focusing on how patients build trust with the healthcare system to help us design care plans that honor those differences versus trying to change them. Being able to form and maintain collaborative relationships with all types of patients and providers within a healthcare system is crucial, and requires knowledge in attachment theory and facilitation skills that MedFTs possess.

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APPENDIX A: IRB APPROVAL LETTER

Page 1 of 2

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · **www.ecu.edu/irb**

Notification of Amendment Approval

From: Biomedical IRB
To: Doyle Cummings
CC: Anthony Gilbird
Date: 7/17/2013
Re: Ame7_UMCIRB 11-001465
UMCIRB 11-001465
Diabetes Integrated Care Study

Your Amendment has been reviewed and approved using expedited review for the period of 7/16/2013 to 2/10/2014. It was the determination of the UMCIRB Chairperson (or designee) that this revision does not impact the overall risk/benefit ratio of the study and is appropriate for the population and procedures proposed.

Please note that any further 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. A continuing or final review must be submitted to the UMCIRB prior to the date of study expiration.The investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

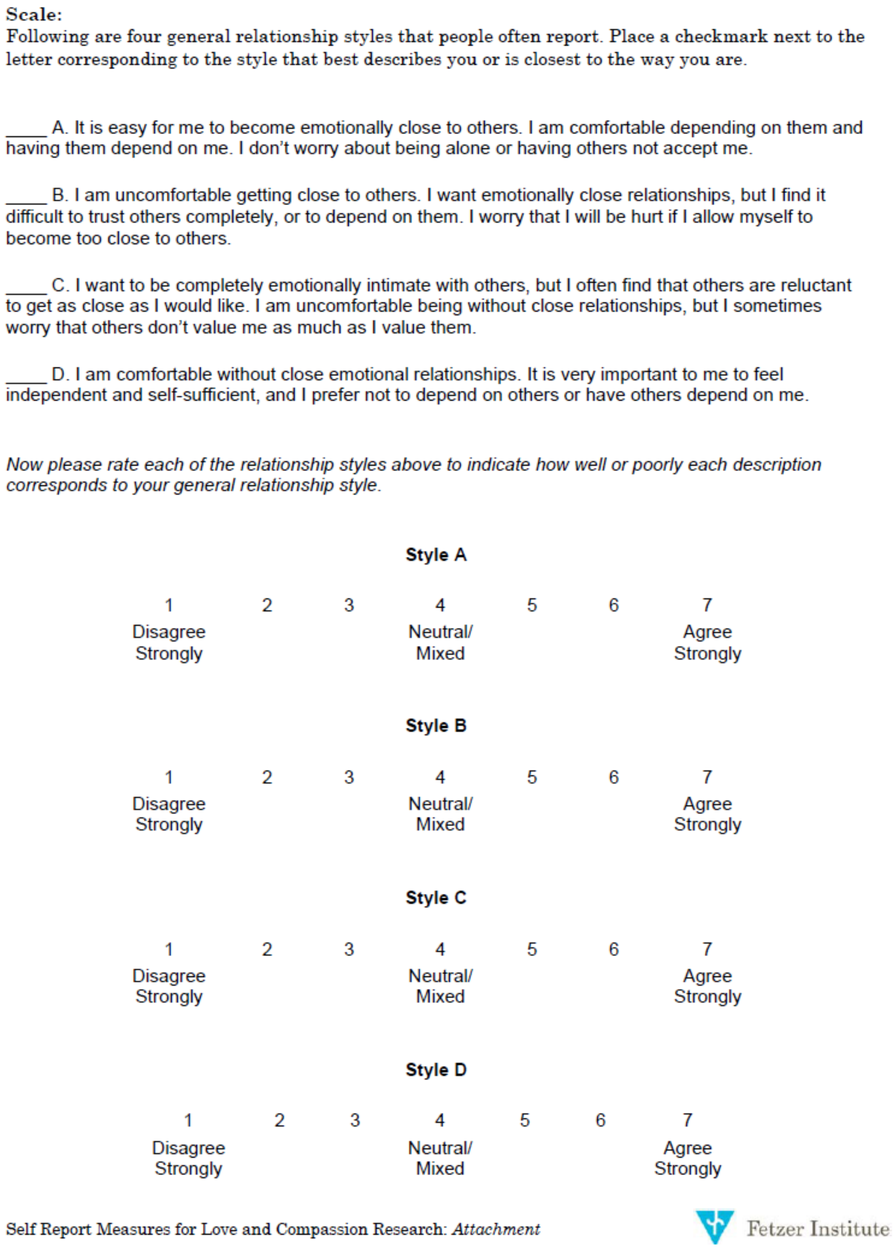
Document	Description
Adult Attachment Style(0.01)	Surveys and Questionnaires
Diabetes Distress Scale(0.01)	Surveys and Questionnaires
Integrated Care Protocol(0.01)	Study Protocol or Grant Application

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

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

http://epirate.ecu.edu/app/Doc/0/CLRQBFD1L094D3Q732JTGL6N59/fromString.html 9/17/2013

APPENDIX B: RELATIONSHIP QUESTIONNAIRE (RQ)



Scale:
Following are four general relationship styles that people often report. Place a checkmark next to the letter corresponding to the style that best describes you or is closest to the way you are.

____ A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

____ B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

____ C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

____ D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

Now please rate each of the relationship styles above to indicate how well or poorly each description corresponds to your general relationship style.

Style A

1	2	3	4	5	6	7
Disagree Strongly			Neutral/ Mixed			Agree Strongly

Style B

1	2	3	4	5	6	7
Disagree Strongly			Neutral/ Mixed			Agree Strongly

Style C

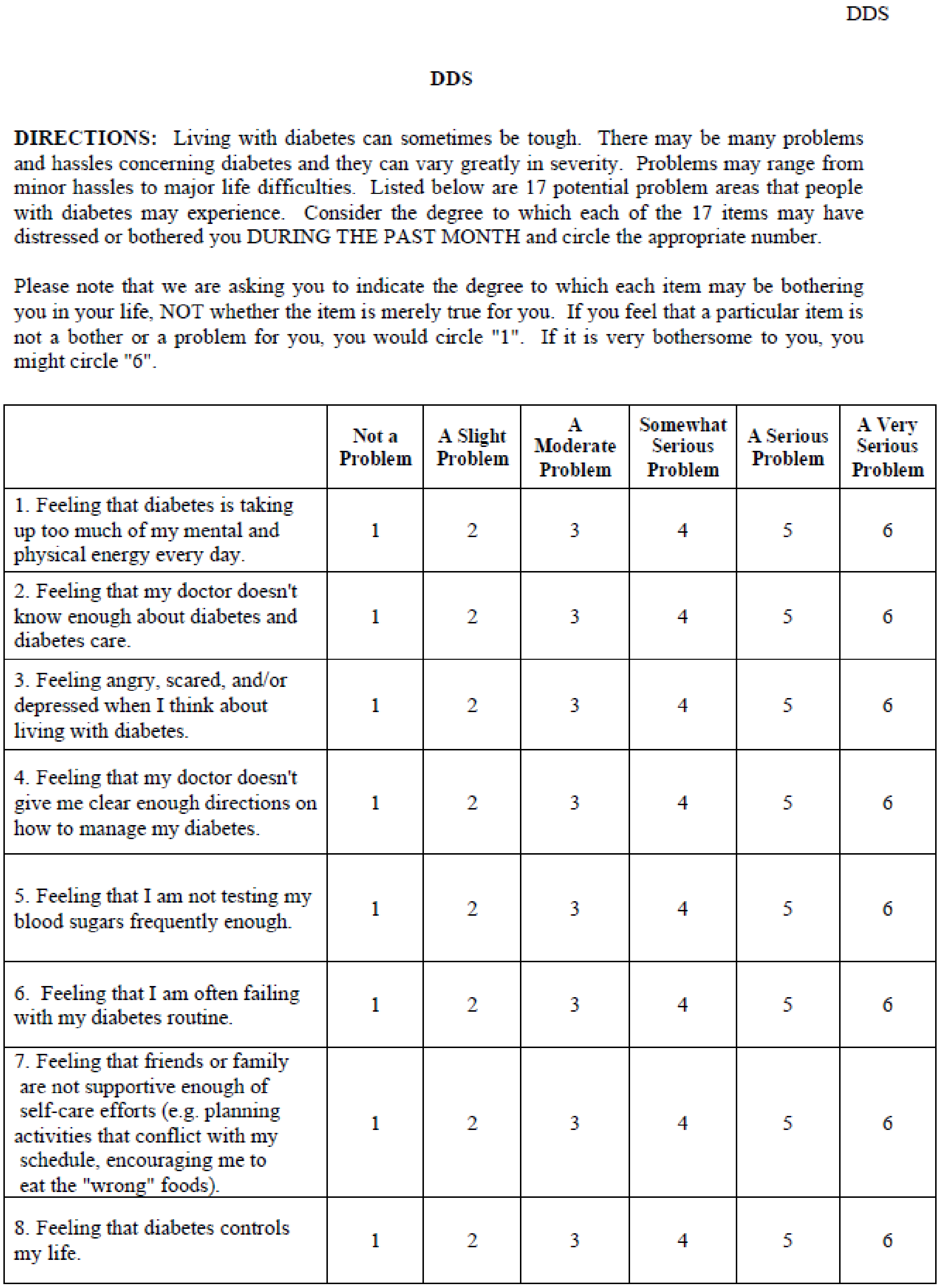
1	2	3	4	5	6	7
Disagree Strongly			Neutral/ Mixed			Agree Strongly

Style D

1	2	3	4	5	6	7
Disagree Strongly			Neutral/ Mixed			Agree Strongly

Self Report Measures for Love and Compassion Research: *Attachment* Fetzer Institute

APPENDIX C: DIABETES DISTRESS SCALE (DDS)



DDS

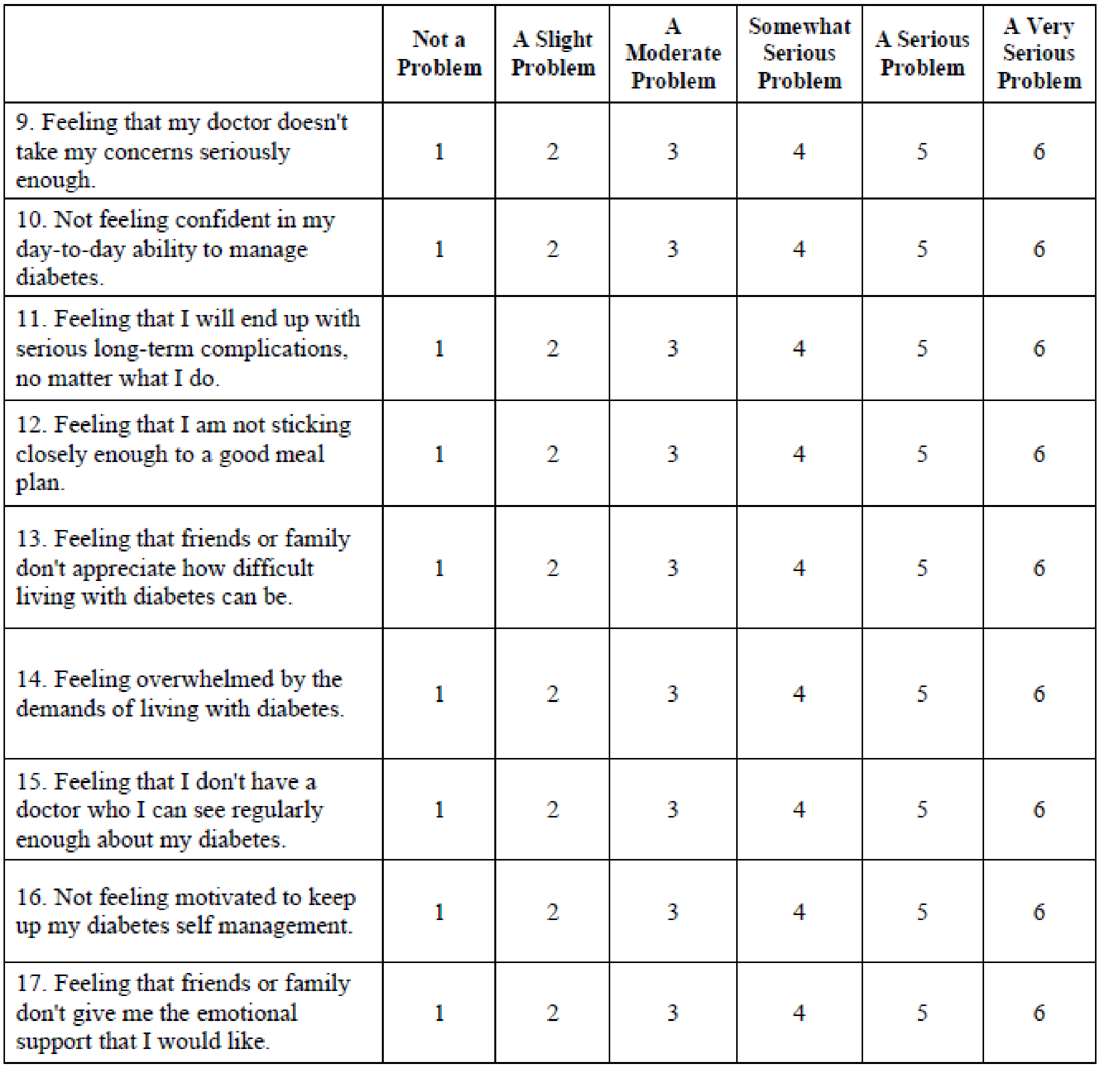
DDS

DIRECTIONS: Living with diabetes can sometimes be tough. There may be many problems and hassles concerning diabetes and they can vary greatly in severity. Problems may range from minor hassles to major life difficulties. Listed below are 17 potential problem areas that people with diabetes may experience. Consider the degree to which each of the 17 items may have distressed or bothered you DURING THE PAST MONTH and circle the appropriate number.

Please note that we are asking you to indicate the degree to which each item may be bothering you in your life, NOT whether the item is merely true for you. If you feel that a particular item is not a bother or a problem for you, you would circle "1". If it is very bothersome to you, you might circle "6".

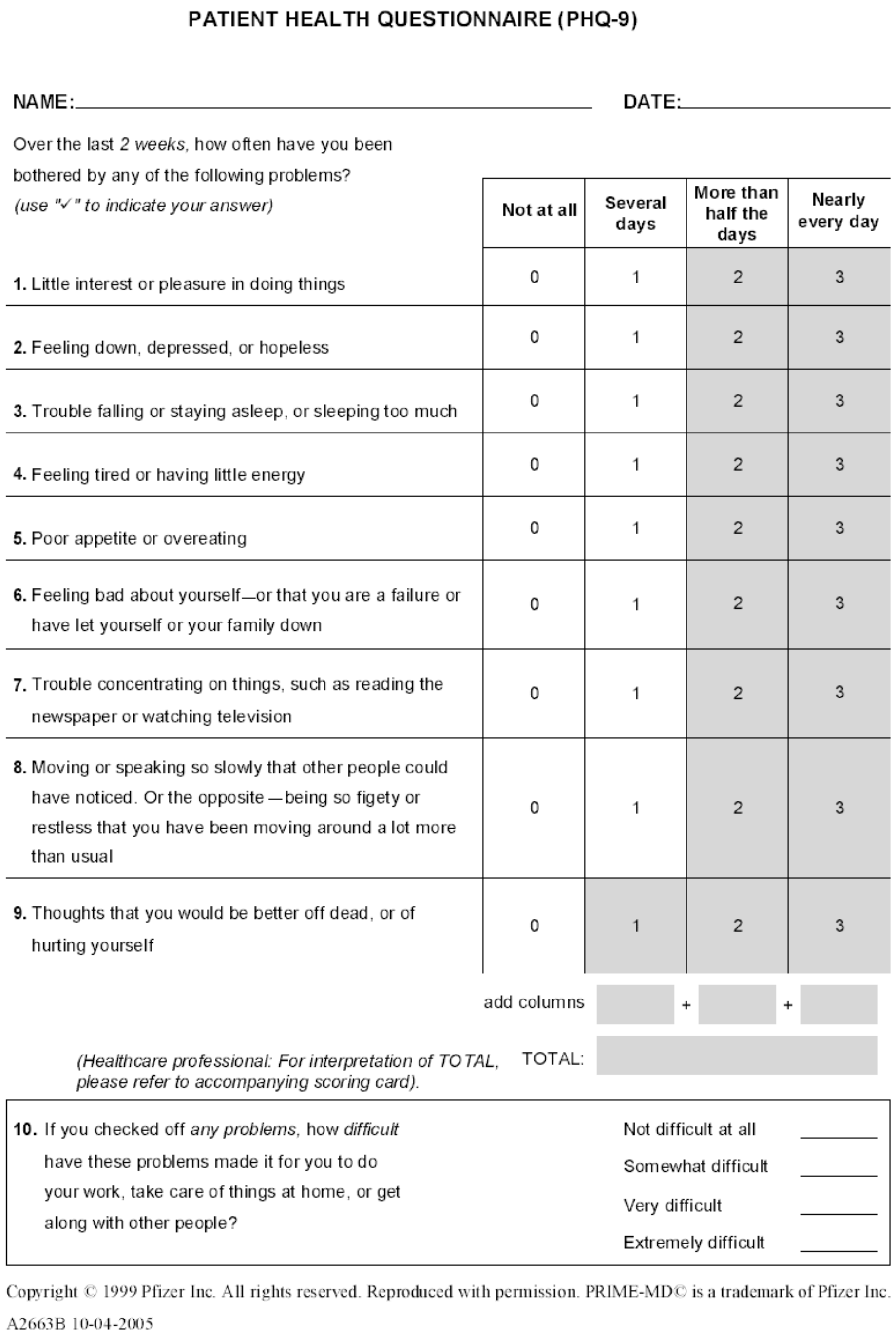
	Not a Problem	**A Slight Problem**	**A Moderate Problem**	**Somewhat Serious Problem**	**A Serious Problem**	**A Very Serious Problem**
1. Feeling that diabetes is taking up too much of my mental and physical energy every day.	1	2	3	4	5	6
2. Feeling that my doctor doesn't know enough about diabetes and diabetes care.	1	2	3	4	5	6
3. Feeling angry, scared, and/or depressed when I think about living with diabetes.	1	2	3	4	5	6
4. Feeling that my doctor doesn't give me clear enough directions on how to manage my diabetes.	1	2	3	4	5	6
5. Feeling that I am not testing my blood sugars frequently enough.	1	2	3	4	5	6
6. Feeling that I am often failing with my diabetes routine.	1	2	3	4	5	6
7. Feeling that friends or family are not supportive enough of self-care efforts (e.g. planning activities that conflict with my schedule, encouraging me to eat the "wrong" foods).	1	2	3	4	5	6
8. Feeling that diabetes controls my life.	1	2	3	4	5	6

DDS



	Not a Problem	A Slight Problem	A Moderate Problem	Somewhat Serious Problem	A Serious Problem	A Very Serious Problem
9. Feeling that my doctor doesn't take my concerns seriously enough.	1	2	3	4	5	6
10. Not feeling confident in my day-to-day ability to manage diabetes.	1	2	3	4	5	6
11. Feeling that I will end up with serious long-term complications, no matter what I do.	1	2	3	4	5	6
12. Feeling that I am not sticking closely enough to a good meal plan.	1	2	3	4	5	6
13. Feeling that friends or family don't appreciate how difficult living with diabetes can be.	1	2	3	4	5	6
14. Feeling overwhelmed by the demands of living with diabetes.	1	2	3	4	5	6
15. Feeling that I don't have a doctor who I can see regularly enough about my diabetes.	1	2	3	4	5	6
16. Not feeling motivated to keep up my diabetes self management.	1	2	3	4	5	6
17. Feeling that friends or family don't give me the emotional support that I would like.	1	2	3	4	5	6

APPENDIX D: PATIENT HEALTH QUESTIONNAIRE (PHQ-9)



PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

NAME:________________________________ **DATE:**______________

Over the last *2 weeks*, how often have you been bothered by any of the following problems? *(use "✓" to indicate your answer)*	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite —being so figety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3
	add columns		+	+

(Healthcare professional: For interpretation of TOTAL, please refer to accompanying scoring card). TOTAL:

10. If you checked off *any problems*, how *difficult* have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	________
Somewhat difficult	________
Very difficult	________
Extremely difficult	________

A2663B 10-04-2005

APPENDIX E: MODIFIED DUNST FAMILY SUPPORT SCALE

Listed below are people and groups that oftentimes are helpful to individuals living with Type II Diabetes. This questionnaire asks you to indicate how helpful each source is to you. Please circle the response that best describes how helpful the sources have been to you during the past two months. If a source of help has not been available to you during this period of time, circle the NA (Not Available) response.

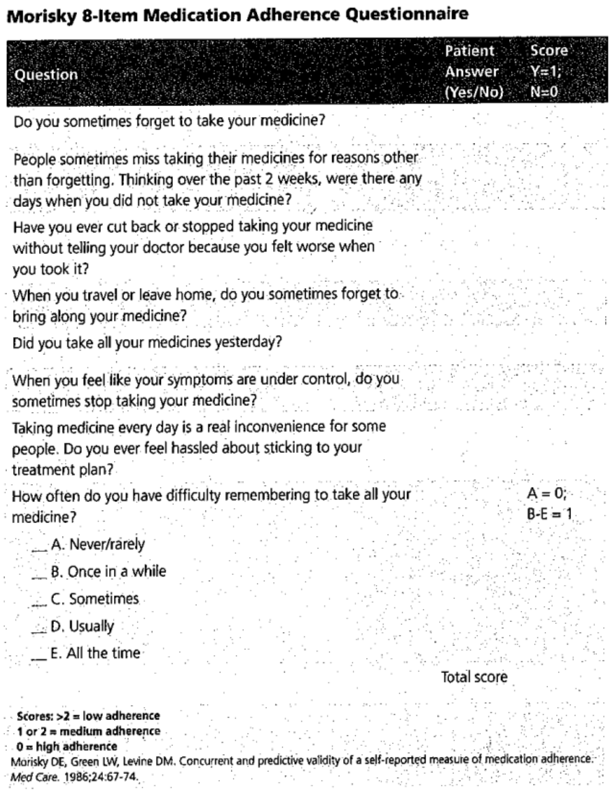
How helpful has each of the following been to you in terms of managing Type II Diabetes (DURING THE PAST TWO MONTHS):	**Not Available**	**Not at All Helpful**	**Sometimes Helpful**	**Generally Helpful**	**Very Helpful**	**Extremely Helpful**
1. Your parents	N/A	1	2	3	4	5
2. Your spouse or partner's parents	N/A	1	2	3	4	5
3. Your relatives/kin	N/A	1	2	3	4	5
4. Your spouse or partner's relatives/kin	N/A	1	2	3	4	5
5. Spouse or partner	N/A	1	2	3	4	5
6. Your friends	N/A	1	2	3	4	5
7. Your spouse or partner's friends	N/A	1	2	3	4	5
8. Your own children	N/A	1	2	3	4	5
9. Your family members with Diabetes	N/A	1	2	3	4	5
10. Friends with Diabetes	N/A	1	2	3	4	5
11. Co-workers	N/A	1	2	3	4	5
12. Social groups/ clubs	N/A	1	2	3	4	5

How helpful has each of the following been to you in terms of managing Type II Diabetes (DURING THE PAST TWO MONTHS):	**Not Available**	**Not at All Helpful**	**Sometimes Helpful**	**Generally Helpful**	**Very Helpful**	**Extremely Helpful**
13. Church members/ minister	N/A	1	2	3	4	5
14. Your regular physician	N/A	1	2	3	4	5
15. Urgent/emergency care physician	N/A	1	2	3	4	5
16. Nutritionist or Dietician	N/A	1	2	3	4	5
17. Professional helpers (nurses, pharmacists, social workers, therapists, etc.)	N/A	1	2	3	4	5
18. Professional agencies (public health, social services, mental health, etc.)	N/A	1	2	3	4	5
19. Others (Specify):	N/A	1	2	3	4	5
20. Others (Specify):	N/A	1	2	3	4	5

APPENDIX F: DIABETES EMPOWERMENT SCALE

EMPOWER! PROJECT: 6 Month Assessment **DIABETES EMPOWERMENT SCALE-SHORT FORM (DES-SF) (1 of 1)**					
STUDY ID #:		**COUNTY:**		**DATE:**	
	Strongly Disagree (1)	**Somewhat Disagree (2)**	**Neutral (3)**	**Somewhat Agree (4)**	**Strongly Agree (5)**
1. In general, I believe that I know what part(s) of taking care of my diabetes that I am dissatisfied with.					
2. In general, I believe that I am able to turn my diabetes goals into a workable plan.					
3. In general, I believe that I can try out different ways of overcoming barriers to my diabetes goals.					
4. In general, I believe that I can find ways to feel better about having diabetes.					
5. In general, I believe that I know the positive ways I cope with diabetes-related stress.					
6. In general, I believe that I can ask for support for having and caring for my diabetes when I need it.					
7. In general, I believe that I know what helps me stay motivated to care for my diabetes.					
8. In general, I believe that I know enough about myself as a person to make diabetes care choices that are right for me.					

APPENDIX G: MORISKY MEDICATION ADHERENCE SCALE



Morisky 8-Item Medication Adherence Questionnaire

Question	Patient Answer (Yes/No)	Score Y=1; N=0
Do you sometimes forget to take your medicine?		
People sometimes miss taking their medicines for reasons other than forgetting. Thinking over the past 2 weeks, were there any days when you did not take your medicine?		
Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?		
When you travel or leave home, do you sometimes forget to bring along your medicine?		
Did you take all your medicines yesterday?		
When you feel like your symptoms are under control, do you sometimes stop taking your medicine?		
Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?		
How often do you have difficulty remembering to take all your medicine? __ A. Never/rarely __ B. Once in a while __ C. Sometimes __ D. Usually __ E. All the time		A = 0; B-E = 1
	Total score	

Scores: >2 = low adherence
1 or 2 = medium adherence
0 = high adherence

Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. *Med Care.* 1986;24:67-74.

APPENDIX H: HEALTHY DAYS CORE MODULE (CDC HRQOL-4)

1. Would you say that in general your health is:

- ○ Excellent
- ○ Very Good
- ○ Good
- ○ Fair
- ○ Poor
- ○ No Code

2. Now thinking about your physical health, which includes physical illness and injury, for how many days durin the past 30 days was your physical health not good?

3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

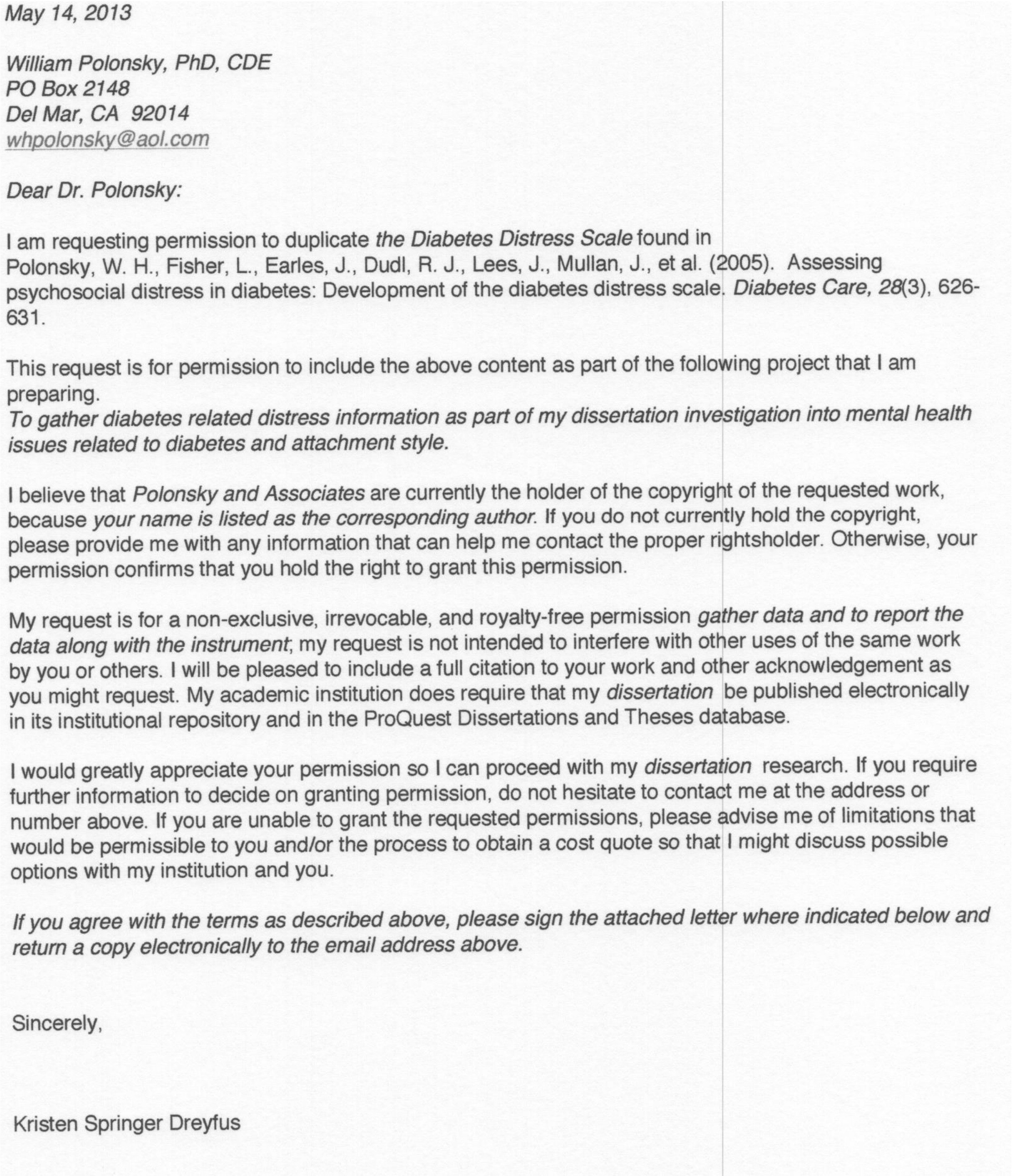
4. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

How many servings of fruit do you eat daily?

How many servings of vegetables do you eat daily?

How many sweetened beverages do you drink daily?

APPENDIX I: DIABETES DISTRESS SCALE PERMISSION LETTER



May 14, 2013

William Polonsky, PhD, CDE
PO Box 2148
Del Mar, CA 92014
whpolonsky@aol.com

Dear Dr. Polonsky:

I am requesting permission to duplicate *the Diabetes Distress Scale* found in Polonsky, W. H., Fisher, L., Earles, J., Dudl, R. J., Lees, J., Mullan, J., et al. (2005). Assessing psychosocial distress in diabetes: Development of the diabetes distress scale. *Diabetes Care, 28*(3), 626-631.

This request is for permission to include the above content as part of the following project that I am preparing.
To gather diabetes related distress information as part of my dissertation investigation into mental health issues related to diabetes and attachment style.

I believe that *Polonsky and Associates* are currently the holder of the copyright of the requested work, because *your name is listed as the corresponding author*. If you do not currently hold the copyright, please provide me with any information that can help me contact the proper rightsholder. Otherwise, your permission confirms that you hold the right to grant this permission.

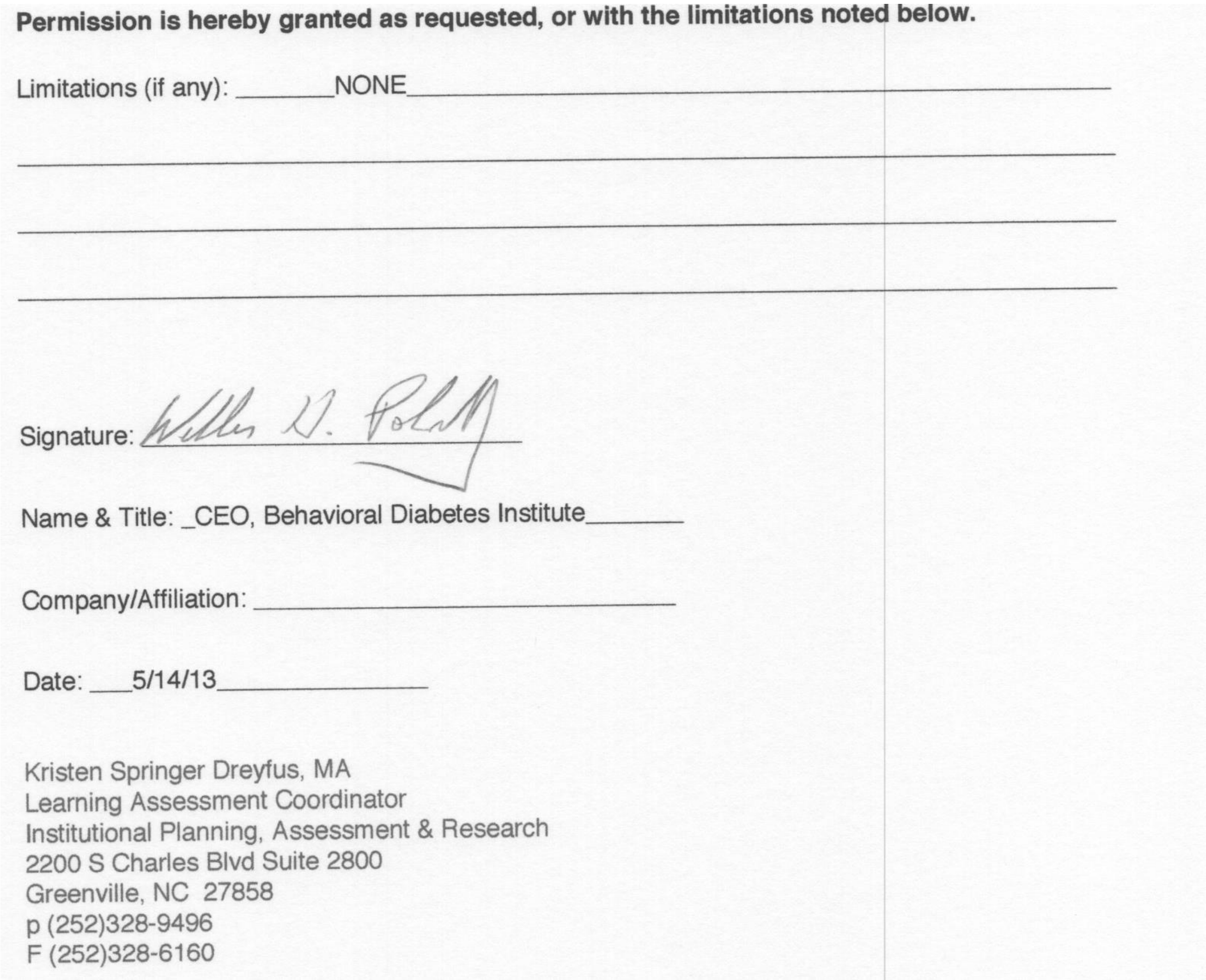
My request is for a non-exclusive, irrevocable, and royalty-free permission *gather data and to report the data along with the instrument*; my request is not intended to interfere with other uses of the same work by you or others. I will be pleased to include a full citation to your work and other acknowledgement as you might request. My academic institution does require that my *dissertation* be published electronically in its institutional repository and in the ProQuest Dissertations and Theses database.

I would greatly appreciate your permission so I can proceed with my *dissertation* research. If you require further information to decide on granting permission, do not hesitate to contact me at the address or number above. If you are unable to grant the requested permissions, please advise me of limitations that would be permissible to you and/or the process to obtain a cost quote so that I might discuss possible options with my institution and you.

If you agree with the terms as described above, please sign the attached letter where indicated below and return a copy electronically to the email address above.

Sincerely,

Kristen Springer Dreyfus



Permission is hereby granted as requested, or with the limitations noted below.

Limitations (if any): _______NONE____

____

____

____

Signature: ____________________________

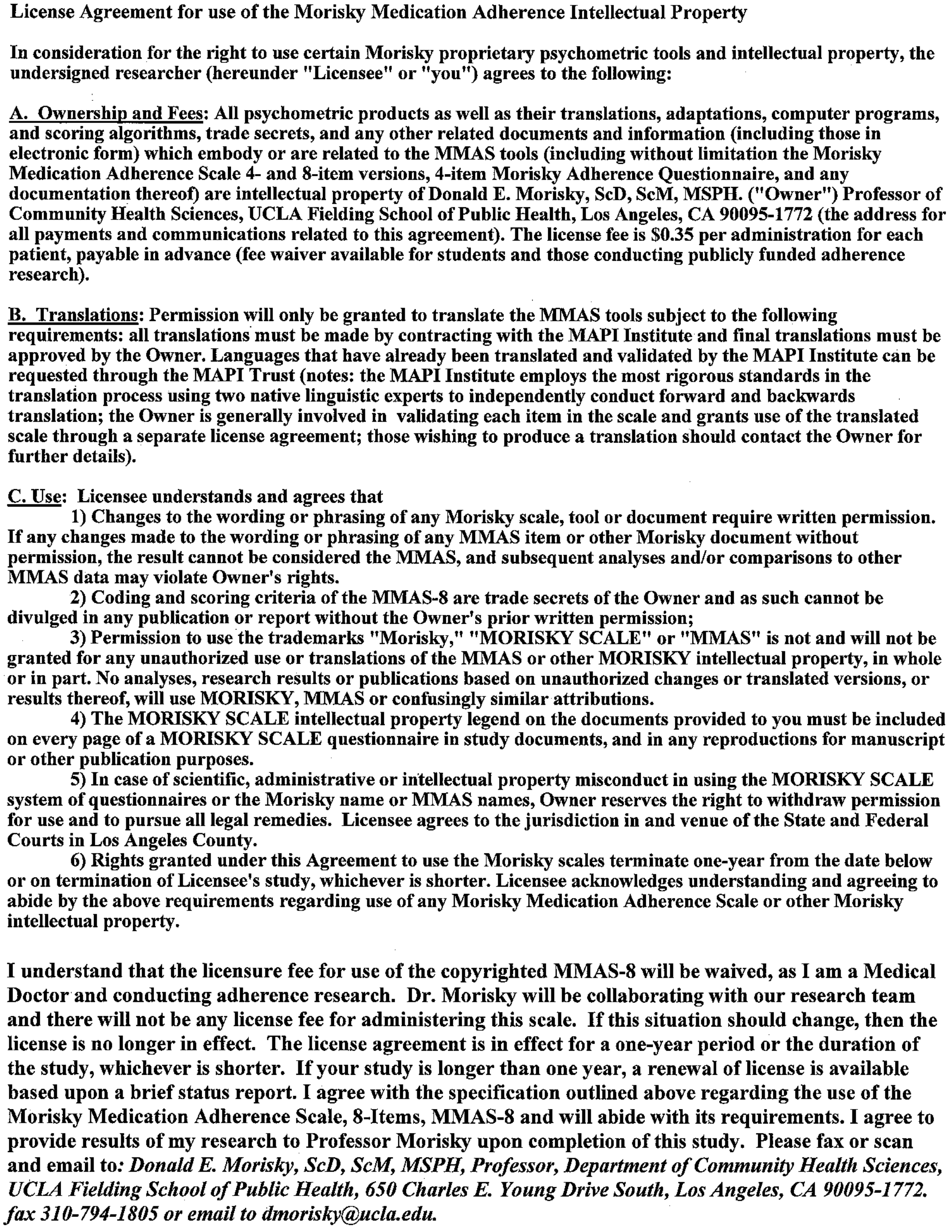
Name & Title: _CEO, Behavioral Diabetes Institute_______

Company/Affiliation: _______________________________

Date: ___5/14/13________________

Kristen Springer Dreyfus, MA
Learning Assessment Coordinator
Institutional Planning, Assessment & Research
2200 S Charles Blvd Suite 2800
Greenville, NC 27858
p (252)328-9496
F (252)328-6160

APPENDIX J: MORISKY MEDICATION ADHERENCE SCALE PERMISSION LETTER



License Agreement for use of the Morisky Medication Adherence Intellectual Property

In consideration for the right to use certain Morisky proprietary psychometric tools and intellectual property, the undersigned researcher (hereunder "Licensee" or "you") agrees to the following:

A. Ownership and Fees: All psychometric products as well as their translations, adaptations, computer programs, and scoring algorithms, trade secrets, and any other related documents and information (including those in electronic form) which embody or are related to the MMAS tools (including without limitation the Morisky Medication Adherence Scale 4- and 8-item versions, 4-item Morisky Adherence Questionnaire, and any documentation thereof) are intellectual property of Donald E. Morisky, ScD, ScM, MSPH. ("Owner") Professor of Community Health Sciences, UCLA Fielding School of Public Health, Los Angeles, CA 90095-1772 (the address for all payments and communications related to this agreement). The license fee is $0.35 per administration for each patient, payable in advance (fee waiver available for students and those conducting publicly funded adherence research).

B. Translations: Permission will only be granted to translate the MMAS tools subject to the following requirements: all translations must be made by contracting with the MAPI Institute and final translations must be approved by the Owner. Languages that have already been translated and validated by the MAPI Institute can be requested through the MAPI Trust (notes: the MAPI Institute employs the most rigorous standards in the translation process using two native linguistic experts to independently conduct forward and backwards translation; the Owner is generally involved in validating each item in the scale and grants use of the translated scale through a separate license agreement; those wishing to produce a translation should contact the Owner for further details).

C. Use: Licensee understands and agrees that

1) Changes to the wording or phrasing of any Morisky scale, tool or document require written permission. If any changes made to the wording or phrasing of any MMAS item or other Morisky document without permission, the result cannot be considered the MMAS, and subsequent analyses and/or comparisons to other MMAS data may violate Owner's rights.

2) Coding and scoring criteria of the MMAS-8 are trade secrets of the Owner and as such cannot be divulged in any publication or report without the Owner's prior written permission;

3) Permission to use the trademarks "Morisky," "MORISKY SCALE" or "MMAS" is not and will not be granted for any unauthorized use or translations of the MMAS or other MORISKY intellectual property, in whole or in part. No analyses, research results or publications based on unauthorized changes or translated versions, or results thereof, will use MORISKY, MMAS or confusingly similar attributions.

4) The MORISKY SCALE intellectual property legend on the documents provided to you must be included on every page of a MORISKY SCALE questionnaire in study documents, and in any reproductions for manuscript or other publication purposes.

5) In case of scientific, administrative or intellectual property misconduct in using the MORISKY SCALE system of questionnaires or the Morisky name or MMAS names, Owner reserves the right to withdraw permission for use and to pursue all legal remedies. Licensee agrees to the jurisdiction in and venue of the State and Federal Courts in Los Angeles County.

6) Rights granted under this Agreement to use the Morisky scales terminate one-year from the date below or on termination of Licensee's study, whichever is shorter. Licensee acknowledges understanding and agreeing to abide by the above requirements regarding use of any Morisky Medication Adherence Scale or other Morisky intellectual property.

I understand that the licensure fee for use of the copyrighted MMAS-8 will be waived, as I am a Medical Doctor and conducting adherence research. Dr. Morisky will be collaborating with our research team and there will not be any license fee for administering this scale. If this situation should change, then the license is no longer in effect. The license agreement is in effect for a one-year period or the duration of the study, whichever is shorter. If your study is longer than one year, a renewal of license is available based upon a brief status report. I agree with the specification outlined above regarding the use of the Morisky Medication Adherence Scale, 8-Items, MMAS-8 and will abide with its requirements. I agree to provide results of my research to Professor Morisky upon completion of this study. Please fax or scan and email to:* ***Donald E. Morisky, ScD, ScM, MSPH, Professor, Department of Community Health Sciences, UCLA Fielding School of Public Health, 650 Charles E. Young Drive South, Los Angeles, CA 90095-1772. fax 310-794-1805 or email to dmorisky@ucla.edu.***

Name and contact information of Licensee / Researcher ***Doyle M. Cummings, Pharm.D., FCP, FCCP***

Berbecker Distinguished Professor of Rural Medicine

Professor of Family Medicine, Pediatrics, & Public Health

Director, Family Medicine Research Division

Associate Director, Ped Healthy Weight Research & Treatment Center

Associate Director for Translation/Outreach,, Diabetes & Obesity Institute

Brody School of Medicine, East Carolina University

101 Heart Drive, Mailstop 654

Greenville, NC 27834

252-744-2607

252-744-3079 (fax)

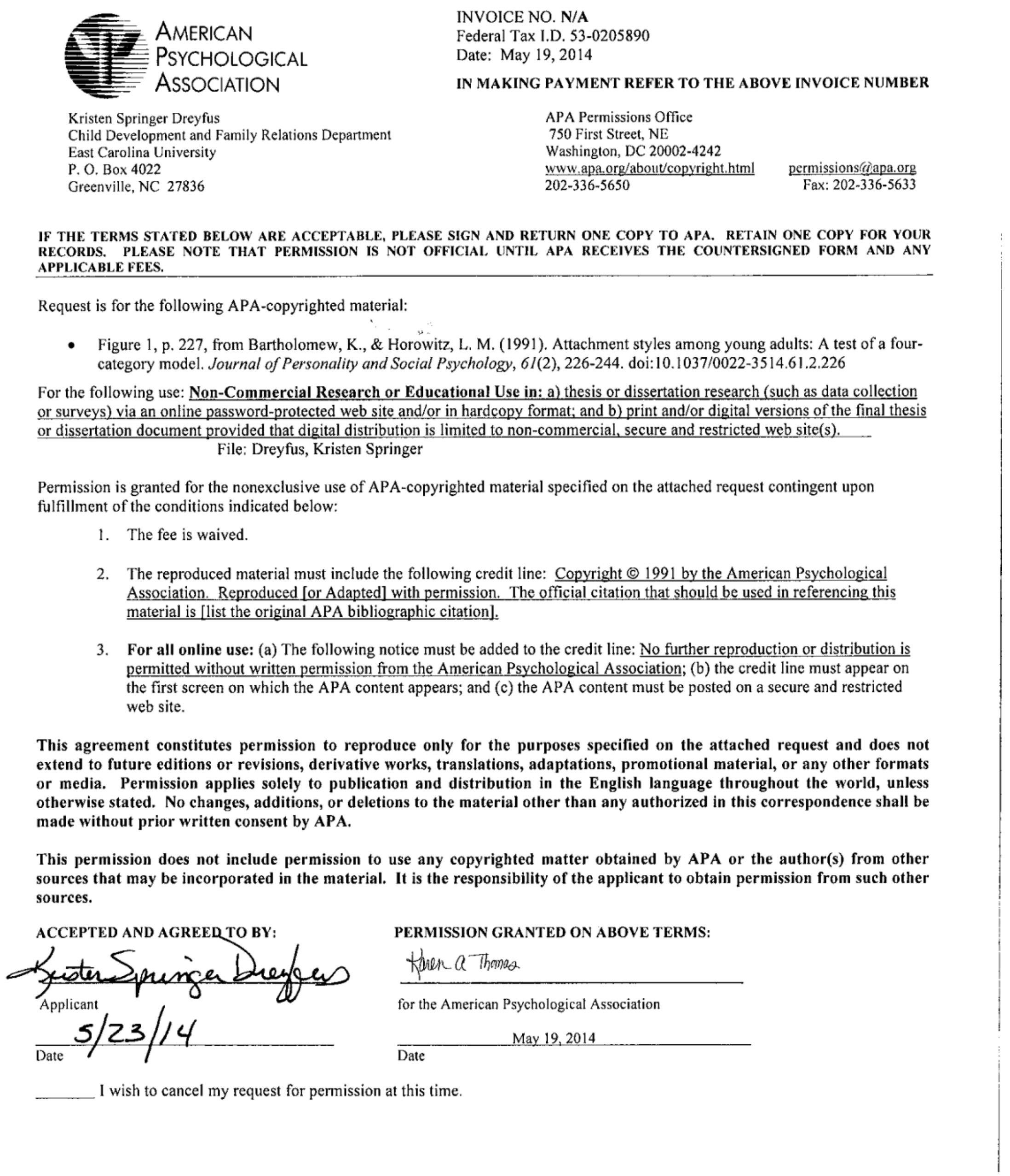
cummingsd@ecu.edu

Title of Research: ....
Empowering Rural African American Women and Communities to Improve Diabetes Outcomes

Signature of researcher: Doyle M. Cummings

Date: 10/17/12

APPENDIX K: FIGURE 1 BARTHOLOMEW AND HOROWITZ PERMISSION LETTER



AMERICAN
PSYCHOLOGICAL
ASSOCIATION

INVOICE NO. **N/A**
Federal Tax I.D. 53-0205890
Date: May 19, 2014

IN MAKING PAYMENT REFER TO THE ABOVE INVOICE NUMBER

Kristen Springer Dreyfus
Child Development and Family Relations Department
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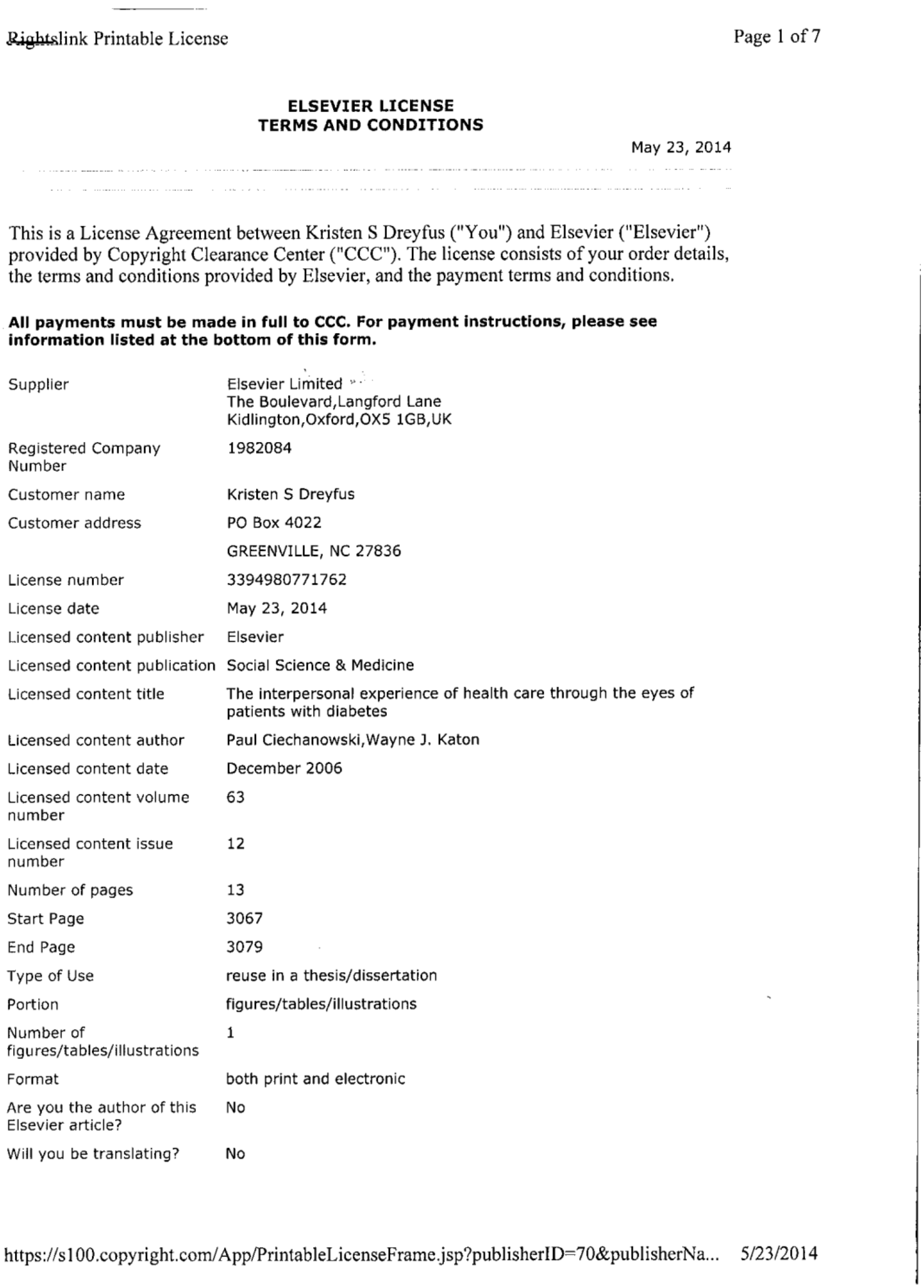

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