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THE EFFECTIVENESS OF COUNSELORS AS CARE MANAGERS IN IMPROVING SELF-MANAGEMENT AND MEDICAL OUTCOMES IN PERSONS WITH POORLY CONTROLLED DIABETES

A Dissertation Submitted to the Graduate Faculty of
Old Dominion University
in fulfillment of the
requirements for the degree of

Doctor of Philosophy
in
Counseling

by

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May 2010

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Trust in God
and
Live to Never Regret.

Risi

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First and foremost, I give honor to my Lord and Savior, Jesus Christ, who is the head of my life and who has been the author and finisher of my faith and this dissertation!

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Abstract

This study investigated whether providing counselors as care managers to individuals who were having difficulty managing their Type II diabetes improved their self-management, health, and functioning. Counselors used the Motivational Interviewing Model and met weekly over a six month period with patients who had Type II diabetes who had been identified as not functioning well in managing their disease. The success of the intervention was determined by a number of measures including physical symptoms of patients; patients' perceptions of the care they received; and patients' self-efficacy in managing their diabetes. The results of this study suggested that providing counselors as care managers had a positive effect on the functioning of poorly functioning diabetes patients.

CHAPTER I

INTRODUCTION

Chronic Illness

This study focused on the care of individuals who have Type 2 diabetes, which is a disease marked by high levels of blood glucose resulting from defects in insulin production, insulin action, or both (U.S. Department of Health, 2007). Participants in this study included individuals who had Type 2 diabetes. Type 2 diabetes typically begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce it. Those diagnosed with this form of diabetes often have predisposing factors such as: older age, being overweight, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity, and certain race/ethnicities (Centers for Disease Control, 2005).

Diabetes is a rapidly growing disease with a tremendous effect on health outcomes; complications include heart disease, kidney failure, loss of limb, blindness. The World Health Organization projected that "diabetes deaths will increase by more than 50% in the next 10 years without urgent action. Most notably, diabetes deaths are projected to increase by over 80% in upper-middle income countries between 2006 and 2015" (WHO; 2008, sec. 5, ¶ 1).

Lifestyle behaviors (diet, exercise, weight loss, smoking cessation) are particularly important in caring for diabetes and in reducing complications. Since these behaviors are patient dependent, self-management plays a significant role in monitoring and regulating the diabetes of patients.

Families and caretakers often make several adjustments to accommodate those with the illness. Caregivers are often left to assist or take the lead in the management of medications,

finances, follow-up medical appointments, diet alterations, transportation, and housing arrangements/remodels. Further, there is emotional and interpersonal adjustment that has to be addressed when attempting lifestyle changes. For instance, there is conflict in family roles and responsibilities, marital relationships, coping to new lifestyles, and in processing grief and loss of the family and patient (e.g., jobs, sexual function, independence; Lew & Piraino, 2005).

Purpose

This study has the following purposes: (a) to explore the perception of care of health care providers (i.e., physicians) and persons with diabetes; (b) to evaluate the link between patients' perceptions of care received and how well patients manage their diabetes; (c) to examine the change in lifestyle practices related to management of diabetes; (d) to measure self-efficacy of the patients in managing diabetes; and (e) to assess the degree of improvement in self-management behaviors and medical outcomes (outlined on scorecards) in persons with poorly controlled diabetes as a result of participation in intervention.

Importance of this Study

Although there is recognition of the life-long battle faced by patients and families who deal with chronic illnesses, the interventions of health professionals do not meet the continual and multidimensional needs of patients and families who deal with chronic illnesses. Researchers attribute the gap between the current care delivered to patients with chronic disease and the ideal care, including continuity and support of patient self-management, to an insufficient health care system. Studies have explained that rather than reacting to the elements of a chronic illness, the traditional health care system typically responds to acute illnesses, which are characterized as having a sudden onset, sharp rise, and short course (Dugdale, 2008). Recent models of care such as the Chronic Care Model and the Patient Centered Medical Home, provide for care

management and patient self-care in chronic diseases such as diabetes. The Chronic Care Model endorses a paradigm shift in which the care system includes provider-oriented components such as continuing education or physician feedback, organizational changes in personnel or management of visits and follow-ups, information systems changes, and patient oriented interventions of an educational or supportive nature (Wagner, Austin, Davis, Hanmarsh, Scaefer, & Bonomi, 2001). The Patient Centered Medical Home encourages comprehensive primary care for patients and partnerships between individual patients and their personal physicians, and when appropriate, the patient's family (Patient-Centered Primary Care Collaborative, 2007).

How care management and patient self-care can be integrated into a primary care practice remains a challenge as the health care system adopts these new models of care. This study will examine the use of health counselors in a primary care practice interacting with persons with poorly controlled Type 2 diabetes. The study will seek to determine whether counselors serving as health care managers can improve the functioning of diabetes patients.

Research Questions

One

Is there a significant difference in patients' and physicians' perceptions of care as measured by the Patient Assessment of Chronic Illness Care (PACIC)?

Two

Is there a significant difference in patients' perception of care, as measured by the PACIC, after completing the Motivational Interviewing intervention?

Three

Is there a significant difference in patients' diabetes self-management, as measured by the DSMART, after completing the Motivational Interviewing intervention?

Four

Is there a significant difference in patients' level of diabetes self-efficacy, as measured by the Diabetes Self-Efficacy Scale, after completing the Motivational Interviewing intervention?

Five

Is there a significant difference in patients' overall diabetes health, as measured by the Scorecard, after completing the Motivational Interviewing intervention?

Limitations

The design for this study is quasi-experimental. The nature of this type of design does not "control for all confounding variables and cannot completely rule out alternate explanations; [therefore, the researcher] must take whatever variable and explanations not controlled for into consideration when interpreting the data" (Leedy & Ormrod, p. 234, 2005). The researcher will also have to be aware that the presence of counselors in the homes of the patients may cause the patients to alter their normal behavior, making the Hawthorne Effect a plausible possibility (Leedy & Ormrod, 2005). As for external validity threats, conclusions drawn from the families in this particular study may be idiosyncratic, which may not allow them to be generalized to the larger population of families.

Assumptions

The following assumptions were made for this study:

(1) Counselors abided by the Motivational Interviewing protocol;

(2) Counselors operated within their realm of expertise and maintain a supervisory relationship with the other health professionals on the treatment team (e.g., physician, nurse, psychologist, etc.);

(3) Participants responded honestly on the instruments and will follow through with care plans developed;

(4) The instruments accurately measured the constructs as they were presented in this document. (Medical Encyclopedia, 2010)

Definition of Terms

Hemoglobin A1C (HbA1C) is a test that measures a person's average blood glucose level over the past 2 to 3 months. Hemoglobin is the part of a red blood cell that carries oxygen to the cells and sometimes joins with the glucose in the bloodstream. Known as hemoglobin A1C or glycosylated hemoglobin, the test shows the amount of glucose that sticks to the red blood cell, which is proportional to the amount of glucose in the blood (Medical Encyclopedia, 2010).

Blood glucose is the main sugar found in the blood and the body's main source of energy. Blood glucose is also called "blood sugar" (Medical Encyclopedia, 2010).

Blood pressure is the force of blood exerted on the inside walls of blood vessels. Blood pressure is expressed as a ratio (example: 120/80, read as "120 over 80"). The first number is the systolic pressure, or the pressure when the heart pushes blood out into the arteries. The second number is the diastolic pressure, or the pressure when the heart rests (Medical Encyclopedia, 2010).

LDL cholesterol (stands for low-density lipoprotein cholesterol) is a fat found in the blood that takes cholesterol around the body to where it is needed for cell repair and also deposits it on the inside of artery walls. LDL cholesterol is sometimes called "bad cholesterol" (Medical Encyclopedia2010).

Microalbumin are small amounts of the protein called albumin in the urine detectable with a special lab test (Medical Encyclopedia, 2010).

Microalbuminuria is the presence of small amounts of albumin, a protein, in the urine. Microalbuminuria is an early sign of kidney damage, or nephropathy, a common and serious complication of diabetes. The American Diabetes Association (ADA) recommends that people diagnosed with type 2 diabetes be tested for microalbuminuria at the time they are diagnosed and every year thereafter. People with type 1 diabetes should be tested 5 years after diagnosis and every year thereafter. Microalbuminuria is usally managed by improving blood glucose control, reducing blood pressure, and modifying the diet (Medical Encyclopedia, 2010).

Self-management in diabetes, is the ongoing process of managing diabetes. Self-management includes meal planning, planned physical activity, blood glucose monitoring, taking diabetes medicines, handling episodes of illness and of low and high blood glucose, managing diabetes when traveling, and more. The person with diabetes designs his or her own self-management treatment plan in consultation with a variety of health care professionals such as doctors, nurses, dietitians, pharmacists, and others (Medical Encyclopedia, 2010).

Stroke is a condition caused by damage to blood vessels in the brain. A stroke may cause loss of ability to speak or to move parts of the body (Medical Encyclopedia, 2010).

Type 1 diabetes is a condition characterized by high blood glucose levels caused by a total lack of insulin. Type 1 diabetes occurs when the body's immune system attacks the insulin-producing beta cells in the pancreas and destroys them. The pancreas then produces little or no insulin. Type 1 diabetes develops most often in young people but can appear in adults (Medical Encyclopedia, 2010).

Type 2 diabetes is a condition characterized by high blood glucose levels caused by either a lack of insulin or the body's inability to use insulin efficiently. Type 2 diabetes develops most

often in middle-aged and older adults but can appear in young people (Medical Encyclopedia, 2010).

CHAPTER II

LITERATURE REVIEW

Chronic Illness

Chronic illnesses are characterized as having long duration, frequent recurrence over a long time, and often by slowly progressing seriousness (Dugdale, 2009).The United States Department of Chronic Disease and Health Promotion (2009) has explained that such illnesses are not contagious but persist throughout the lifespan, do not resolve spontaneously, and are rarely cured completely. Chronic illnesses —such as heart disease, cancer, and diabetes—are the leading causes of death and disability in the United State and account for 70% of all deaths, which is 1.7 million each year (Centers for Disease Control, 2008). Of the trillion dollars spent on healthcare annually, 70% goes to financing the cost of chronic illnesses (Centers for Disease Control, 2004).

Chronic diseases cause major limitations in daily living. The challenge in handling chronic illnesses is multidimensional. For instance, the struggles often found among patients with various types of chronic diseases mirrored those of End-Stage Renal Failure patients on dialysis. Researchers found that a majority of renal patients felt hopeless while others were anxious, thus resulting in an overall low rating of their quality of life (QOL) (Lew & Piraino, 2005). Gilbar, Or-Han, and Plivazky (2005) attributed patients' distress to the constant threat of death, reduced life expectancy, decreasing physical strength and an intrusive medical regime that robbed patients of their autonomy. Along with QOL, depression was also evaluated by Lew and Piraino. They stated that QOL and depressive symptoms appear to be the result of the interplay of disease severity and complications, the ability of the patient to adapt, perception of illness, social support and likely, although not proven, interactions with the health care team (Lew &

Piraino). They reported that depression, the sense of hopelessness, and the perception of illness worsen the QOL in End-Stage Renal Disease patients and is closely linked to depressive symptoms (Lew & Piraino). The researchers also said that major depression is seen in approximately 6 percent of prevalent Peritoneal Dialysis patients, while another 8 percent suffer dysthymic disorder (Lew & Piraino).

Although chronic diseases are among the most common and costly health problems, they are also among the most preventable (Centers for Disease Control, 2004). Adopting healthy behaviors such as eating nutritious foods, being physically active, and avoiding tobacco use can prevent or control many of the devastating effects of these diseases (Centers for Disease Control, 2004).

Diabetes

The Centers for Disease Control (2007) has offered detailed information on the various types of diabetes: Type 1, Type 2, and gestational. The organization is thorough in its explanation of the defects in the body's glucose system pertinent to each type as well as in its report of the effects diabetes has demographically (e.g., age, gender, ethnicity).

Type 1

According to the Centers for Disease Control's (CDC) Department of Health and Human Services (2007), diabetes is a group of diseases marked by high levels of blood glucose resulting from defects in insulin production, insulin action, or both. Diabetes develops when the body's immune system destroys the only cells in the body that makes insulin, which regulates the blood. Type 1 usually strikes children and young adults, but it can occur at any age. It accounts for 5-10% of cases in adults. Risk factors include the individual's autoimmune systems, genetic

background, and environmental setting. There is no way to prevent Type 1 diabetes, although the CDC has several clinical trials in progress related to possible prevention.

Type 2

Type 2 diabetes usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce it. Type 2 diabetes is associated with older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity, and race/ethnicity. At particularly high risk for Type 2 diabetes and its complications are African Americans, Hispanic/Latino Americans, American Indians, some Asian Americans, and Native Hawaiians or Other Pacific Islanders. Type 2 diabetes in children and adolescents is rare, but accounts for 90-95% of the incidence of diabetes in adults.

Gestational

Gestational diabetes is a form of glucose intolerance diagnosed during pregnancy. It occurs more frequently among African American, Hispanic/Latino American, American Indian women who are obese, and in women with a family history of diabetes. During pregnancy, gestational diabetes requires treatment to normalize maternal blood glucose levels to avoid complications in the infant. Immediately after pregnancy, 5-10% of women with gestational diabetes are found to have diabetes, usually type 2. Women who have had gestational diabetes have a 40-60% chance of developing diabetes in the next 5–10 years.

Statistics

In 2007, the Centers for Disease Control reported national estimates on the effects diabetes has had on the United States. For the one analyzed year alone, there were 23.6 million people (7.8% of the population) who had diabetes (CDC, 2007). Of that amount, approximately

186,300 people were younger than 20 years, which is equivalent to 0.2% of all people in this age group. A total of 10.7% of all people above 20 years of age have diabetes. In focusing on the elderly population who were 60 year of age or older, it was found that 12.2 million, or 23.1% of all people in this age group had diabetes (CDC, 2007). The CDC goes on to report that a total of 11.2% of all men aged 20 years or older had diabetes and 10.2% of all women aged 20 years or older had diabetes. The total direct and indirect cost of treating and preventing diabetes in the U.S. was $174 billion in 2007 (CDC, 2007).

Complications

The effects of Diabetes are varied, are devastating, and can even be lethal. Table 1 shows the most common complications of diabetes as reported by the Centers for Disease Control and Prevention (2007).

Table 1.

Common Complications of Diabetes

Complication	Effects
Heart Disease and Stroke	--Adults with diabetes have heart disease death rates about 2 to 4 times higher than adults without diabetes. --The risk for stroke is 2 to 4 times higher among people with diabetes.
Hypertension	--In 2003–2004, 75% of adults with self-reported diabetes had blood pressure greater than or equal to 130/80 millimeters of mercury (mm Hg), or used prescription medications for hypertension.
Blindness	--Diabetes is the leading cause of new cases of blindness among adults aged 20–74 years.
Kidney Disease	--Diabetes is the leading cause of kidney failure, accounting for 44% of new cases in 2005. --In 2005, a total of 178,689 people with end-

	stage kidney disease due to diabetes were living on chronic dialysis or with a kidney transplant in the United States and Puerto Rico.
Nervous System Disease	--About 60% to 70% of people with diabetes have mild to severe forms of nervous system damage. --The results of such damage include impaired sensation or pain in the feet or hands, slowed digestion of food in the stomach, carpal tunnel syndrome, erectile dysfunction, or other nerve problems.
Amputations	More than 60% of nontraumatic lower-limb amputations occur in people with diabetes.
Dental Disease	--Persons with poorly controlled diabetes (A1c > 9%) were nearly 3 times more likely to have severe periodontitis than those without diabetes. --Almost one-third of people with diabetes have severe periodontal disease with loss of attachment of the gums to the teeth measuring 5 millimeters or more.
Difficulties in Pregnancy	--Poorly controlled diabetes before conception and during the first trimester of pregnancy among women with type 1 diabetes can cause major birth defects in 5% to 10% of pregnancies and spontaneous abortions in 15% to 20% of pregnancies. --Poorly controlled diabetes during the second and third trimesters of pregnancy can result in excessively large babies, posing a risk to both mother and child. --Poorly controlled diabetes before conception and during the first trimester of pregnancy among women with type 1 diabetes can cause major birth defects in 5% to 10% of pregnancies and spontaneous abortions in 15% to 20% of pregnancies. --Poorly controlled diabetes during the second and third trimesters of pregnancy can result in excessively large babies, posing a risk to both mother and child.

Note. From "*National diabetes fact sheet: General information and national estimates on diabetes in the United States*" by Centers for Disease Control and Prevention, 2007.

People with diabetes are more susceptible to many other illnesses, and once they acquire other illnesses they often have worse prognoses. For example, they are more likely to die with pneumonia or influenza than people who do not have diabetes. Persons with diabetes aged 60 years or older are 2–3 times more likely to report an inability to walk one-quarter of a mile, climb stairs, do housework, or use a mobility aid compared with persons without diabetes in the same age group.

Lifestyle

The American Association of Diabetes Educators (AADE, 2009) has suggested that in order to manage diabetes, individuals will be successful if they follow the Self-Care Behaviors Framework. This framework suggests lifestyle changes in several areas: Eating, being active, monitoring, taking medication, problem solving, reducing risks, and healthy coping. Supporters of both the Chronic Care Model and the Patient Centered Family Home initiative adhere to the recommendations of AADE in their treatment of patients with diabetes.

Models of Diabetes Treatment

Chronic Care Model

The Chronic Care Model is a direct reaction against the traditional care system, which offers care organized by separate providers, focused on responding to crises events that frequently ignore the multidimensional needs of those being served (Bringewatt, 2003). The Chronic Care Model, on the other hand, purports a paradigm shift in which the care system offers continuing education, physician feedback, organizational changes in personnel, management of visits and follow-ups, information systems changes, and patient-oriented interventions of an

educational or supportive nature (Wagner, Austin, Davis, Hindmarsh, Scaefer, Bonomi, 2001). In the Chronic Care Model, clients are more assertive and involved in their post-discharge treatment. In this model, patients are considered self-managers. A study by Wagner et al. (2001) outlined the tasks that are to be implemented by patients including: Engaging in activities that promote health and build physiological strength; interacting with health care providers; monitoring their own physical and emotional status; and manage the impact of the illness on their ability to function (Wagner, Austin, & Von Korff, 1996).

The Chronic Care Model (CCM) has proved efficacious in managing chronic conditions, such as diabetes, congestive heart failure, depression, and asthma (Ely, Banitt, Befort, Hou, Rhode, 2008). Ely et. al. (2008) expanded the research on the CCM by conducting a randomized experiment in primary care practices in rural Kansas with 107 patients suffering with obesity. It was their goal to use the components of the CCM (identification of at-risk populations, evidence-based, guideline-driven care, and continuous process and outcome monitoring) to "close the quality gap illustrated by currently observed low rates of nutritional, physical activity, and general obesity counseling in primary care settings" (Ely et al., p. 126). The researchers collaborated with physicians to identify patients and provided the physicians with an electronic means of receiving patients' progress while in the study. The patients within the active arm (n=51) of the study received telephone-based counseling. The counseling was provided by Master's level counselors trained on the Motivational Interviewing Model, described below, for a period of 8 months. Discussion topics were used but not limited to the following: (1) relationship with food; (2) increasing fruit, vegetable, and fiber intake; (3) decreasing daily fat intake; (4) decreasing daily caloric intake; (5) increasing physical activity; (6) past weight loss attempts; and (7) body image and weight loss goals. The researchers found that the active arm participants

lost more weight than did the control group, appreciated the accountability and support of the intervention, were motivated to change weight control behaviors, and reported that the program increased their attention to obesity care in subsequent visits with their primary care doctors. The physicians were also appreciative of the electronic feedback and the support offered to patients involved in the program.

The Chronic Care Model has also been applied to the treatment of patients suffering with an addiction to alcohol. Researchers have found parallels in the course of alcoholism and in other chronic conditions. For instance, "addictions develop insidiously over time, and heavy substance use and associated functional impairment often recur for many years after criteria for dependence had been met...[with cyclical] relapse occurring within 6 months post discharge" (Cacciola, Camilleri, Carise, Rikoon, McKay, & McLellan, 2008, p. 1208). With such parallels in the two conditions, the Focused Aftercare approach was developed and grounded in the Chronic Care Model (Cacciola et al.). As a post discharge intervention program, Focused Aftercare provided multidimensional and continuous care. It endeavored to sustain patient recovery and progress initiated during residential care, address the needs of patients once they re-entered their communities, and support patients in continued sobriety and recovery. This service was given in a semi-structure interview format by trained counselors who telephonically provided problem-solving skills, referral sources, and served as a liaison between the Betty Ford Center (a residential treatment facility) and the patients. After assessing the effectiveness of the continuing care fashioned treatment program, Focused Aftercare, researchers found that during the first year post-discharge, patients exhibited more engagement in the continuing treatment process, and typically reported greater rates of recovery-oriented behaviors than residents in the past (frequent 12-Step attendance, having a sponsor, contact with alumni, and abstinence (Cacciola et al.). The

study also concluded that level of commitment to sobriety while in the Betty Ford Center was a predictor of commitment post discharge; however, the data on how to increase commitment while in the residential facility remains unfounded (Cacciola et al.).

Szecsenyi, Rosemann, Joos, Peters-Kilimm, and Miksch (2008) evaluated the Diabetes Management Program on its effectiveness in holistically treating diabetes and on how it fared in comparison to the Chronic Care Model and behavioral care counseling. The Diabetes Management Program is described as a "structured, multifaceted, systemic approach...[involving] evidenced-based clinical guidelines, basic dataset, quality indicators, transfer between different levels of care, provisions of feedback, and recall for patients" (Szecsenyi et al., p. 1150). The Program is defined by national group experts and based on collaborations between insurers and providers, meaning if patients desire to participate, doing so is solely dependent upon the approval and recommendation of the primary care physician. Szecsenyi et al. reported that the Diabetes Management Program was initially criticized by physicians for its lack of innovative recommendations; however, in 2007, half of the estimated population of people with diabetes was enrolled (Szecsenyi et al.). As a measure of evaluation, the researchers sent out the Patient Assessment of Chronic Illness Care to German patients with type 2 diabetes. By separating out patients enrolled in the Diabetes Management Program from those who were not, the investigators found that patients in the Diabetes Management Program received patient-centered, structured, and collaborative care according to the Chronic Care Model (Szecsenyi). Results on the subscales suggest that enrolled patients received better care (follow-up/coordination of care, goal setting/tailoring, and problem-solving/contextual). In essence, patients received care in which the health care team offered services outside of the

primary care practice, connected them with specialists, facilitated goal setting practices, and considered the context of their lifestyle when suggesting a treatment plan (Szecsenyi et al.).

Of the leading 10 chronic illnesses, 50 percent of deaths are attributable to lifestyle behaviors that cause or complicate chronic illnesses (Glasgow, Orleans, & Wagner, 2001). As proponents of the Chronic Care Model, the investigators purported that the deficiencies in the organization and delivery of chronic illness care will improve once the focus of care has shifted (Glasgow, Orleans, & Wagner). The change in service provided is a shift from the customs of acute care practices and goes to "realigning organizational incentives and priorities, reengineering the present reactive, symptom-driven health care system, training providers and patients to work as partners in a collaborative care process" (Glasgow, Orleans, & Wagner, p.580).Other researchers also have agreed with the proposed shift stating that there will be a decrease in health risk behaviors such as tobacco use, risky drinking, unhealthy dietary patterns, and physical inactivity if the Chronic Care Model is implemented into primary care practices (Hung, Rundall, Tallia, Cohen, Halpin, & Crabtree, 2007). These researchers said that primary care practices "should cultivate openness to change and innovation while maintaining a trustful and participative environment" and that without openness to change, the Model will not prove effective in preventative care interventions (Hung, et al.).

Sangvai, Cipriani, Colborn, and Wald (2007) also studied the effects of applying the Chronic Care Model to a prevention program. These researchers focused on injury prevention programs provided in primary care settings for children. The study investigated automobile restraints, use of smoke detectors, safe storage of hazardous material, setting of appropriate tap water temperature, and safe storage of guns (Sangvai, et al.). Upon analysis, the research team concluded that they were "unable to provide definitive evidence of the effectiveness of the

Chronic Care Model in changing safety practices in the home" (Sangvai, et a., p. 234). Yet, the results did reveal a positive impact on the use of smoke detectors and storage of hazardous materials once components of the Chronic Care Model was implemented in primary care prevention service delivery practices (Sangvai, et a.).

In essence, the Chronic Care Model is,

> "currently being implemented in more than 300 diverse health care systems affecting quality-improvement for asthma, congestive heart failure, depression, diabetes, and prevention of frailty in the elderly... as well as in organizations such as, fee-for-service, hospital based, Veterans Administrations, managed care, and community health settings" (Glasgow, Orleans, & Wagner, 2001, p. 579).

To further highlight the efficacy of the Chronic Care Model, researchers evaluated the model's relationship to patient health and patients' health related Quality of Life, defined by the Centers for Disease Control as frequency of unhealthy days in a month period and number of activity limiting days, respectively (Hung, Glasgow, Dickiunson, Frogshaug, 2008). Of the practices investigated, their use of patient registries, of leaders to promote health onsite, and the integration of evidence-based guidelines into clinical practice were routinely associated with healthier patients (Hung, et al.). Benefits for the care setting were also found in that utilizing the precepts of the Chronic Care Model opened the way for the proactive support for behavior change, implementation of clinical information systems, and integration of specialized health professionals as part of the care delivery team (Hung, et al.). In treating patients with

osteoarthritis, Rosemann, Laux, Szecsenyi, and Grol (2008) found that the efficacy of the Chronic Care Model was dependent upon the age, education, and occurrence of depression. In their study, patients who were younger, had an advanced level of education, and low rates of depression scored better on the Patient Assessment of Chronic Illness Care (the measurement of patients' perception of care), revealing a stronger congruence between care received and the Chronic Care Model. The study also showed that patients with osteoarthritis did not receive holistic and multidimensional care as suggested by the Chronic Care Model (Rosemann et al., 2008). The authors believe this lack of systemic care and physician engagement may have been due to general practitioners not regarding osteoarthritis as threatening or severe as other chronic conditions such as heart disease or diabetes (Rosemann et al.). In addiction, the severity of osteoarthritis does not correlate with the scores on the Patient Assessment of Chronic Illness Care, which means that patients' perception of care provided by their physicians is not affected by the progression of their illness nor their self-rated quality of life (Rosemann et al.).

Motivational Interviewing

Originated by William R. Miller, the Motivational Interviewing Model is a "directive, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence" (Emmons & Rollnick, 2001, p. 69). The key principles of the model are expressing empathy using reflective listening; developing discrepancy between client goals and current problem behaviors using objective feedback; assuming that the client is responsible for decision to change; rolling with resistance; and supporting self-efficacy and optimism for change. Emmons and Rollnick purported that counselors understand that there is a distinction between providing feedback and interpretation of clients' shared experience. Counselors

actively engage clients in the evaluation of their behavior and likely promote an evaluation of clients' behavior that changes the balance between the positive and negative aspects of change.

Spirit of Motivational Interviewing.

Readiness to change is not a client trait, but a fluctuating product of interpersonal interaction (Emmons & Rollnick, 2001). The therapeutic relationship functions best as a partnership rather than an expert/recipient relationship (Emmons & Rollnick). Motivation to change should be elicited from the client, not imposed by the counselor. It is the client's task, not the counselor's, to articulate and resolve his or her ambivalence (Emmons & Rollnick). The counselor is directive in helping the client examine and resolve ambivalence (Emmons & Rollnick). The counseling style is generally a quiet and eliciting one; a style in which direct confrontation is not practiced by the counselor (Emmons & Rollnick).

Motivational Interviewing in a session consists of the following: Reflective listening to acknowledge both sides of ambivalence surrounding behavioral change; open-ended questions to amplify client-generated reasons for change and resolve ambivalence; emphasizing personal choice; affirming self-confidence in ability to change; supporting perceived importance of behavioral change; and reflection to sidestep resistance and defensiveness (West, DiLillo, Bursac, Gore, Greene, 2007). Counselors are supposed to elicit "change talk and commitment language" (West, et al., p. 1082). Table 2 showcases the components of a MI based brief negotiation interview including the goal of the session, type of intervention, and suggested questions to ask to accomplish the goal.

Table 2. Components of a brief negotiation interview [b]

Goals	Intervention components	Suggested Strategies/ Questions
Understand client's concerns and circumstances	Establishing rapport	**Use open-ended questions that demonstrate concern for client as a person.** "How are you feeling today? Are you comfortable?" "If I could see the situation through your eyes, what would I see?"
Get client agreement to talk about topic.	Raise subject	**Request permission to discuss topic.** "Would you mind spending a few minutes talking about [topic] and how you see it affecting your health?"
Understand readiness to change behavior and to accept treatment/evaluation referral.	Assess readiness	**Use an assessment tool to assess readiness, and discuss results with client.** "How do you feel about [topic]?" "How ready are you to change your use of [topic]?"
Raise client awareness of consequences of the behavior, and share provider's concerns.	Provide feedback.	**Use objective data from individual's medical evaluation if possible, and then elicit reactions from client.** "What do you make of these results?"
Assure client that ongoing support is available.	Offer further support, targeted to client's level of readiness to change.	**For clients who are "not ready" to change**: "Is there anything else you want to know about [topic]?" "What would it take to get you to consider thinking about a change?" **For clients who are "unsure" about change:** "What are the good things you like about

[topic]? What does it do for you?"

"What are the things you don't like about [topic]? What concerns do you have about it?"

For clients who are "ready" to change: "Here are some options for change. What do you think would work best for you?"

Provide support and referral.

Note. From "Motivational interviewing in health care settings: Opportunities and limitations," by Emmons and Rollnick, 2001, *American Journal of Preventative Medicine 20,* 68-74.

Welch, Rose, and Ernst (2006) explained that Motivational Interviewing was originally used in treating those addicted to alcohol, has reduced the risk of HIV, ahs helped persons with eating disorders, works well in criminal justice management, helps increase fruit and vegetable intake, helps increase exercise, and works well for persons with major psychiatric disorders.

Fennell Four-Phase Model

Patricia Fennell (2003) has developed a four phase model to capture the experiences of patients with a chronic illness and their families. The model also defines the role of a mental health professional at each of the phases. At the onset of the illness, the patient and family are in crisis responding with disbelief and seeking help from medical professionals, from their spirituality, or by abusing substances. The therapist, in turn, is tasked with helping the client handle immediate symptoms, pains, or traumas surrounding the new experience (Fennell). When in the stabilization phase, patients are more familiar with their illness and attempt to partake in pre-illness activities, which overtaxes them leading them to relapse and feel defeated. The counselor's role here at this point is to stabilize and restructure life patterns and perceptions (Fennell). During the third phase, resolution, there is an initial acceptance that one's pre-illness self will not return and the therapist helps the patient develop a new self and to seek personally meaningful guidance from a greater source (Fennell). Integration is the phase where despite the plateaus and relapses related to the illness, the client is able to bring together part of their pre- and post-illness selves (Fennell). With such a level of integration, the counselor aids the patient in finding an occupation (if appropriate) and in creating a social network and a spiritual or philosophical framework. Unfortunately, patients are not always capable of reaching the integration phase; a state of resolution and acceptance, for they get caught between phases 1 and 2; a state of crisis and turmoil (Fennell). Sperry (2009) explained that patients with chronic

illness either do not get a mental health professional who is competent to address their unique needs as they transition or they never have the resources or opportunity to receive such support. Specifically, an appropriate counseling intervention "not only helps chronically ill patients in finding new meaning in life and the encouragement and coping skills to live that life with a measure of dignity and a sense of wellness but also can keep them alive while they escape [a] dangerous looping cycle" (Sperry, 2009, p 181).

Barriers to Treatment

Barriers to optimal diabetes self-management are varied. A patient may experience environmental triggers, emotional distress, financial strains, or difficulties due to cultural factors (American Association of Diabetes Educators, 2009). The dependent variables in this study will include measures of healthy lifestyle behaviors and perceived resources and barriers to self-management, perceptions of care, patient self-efficacy, blood pressure, cholesterol level, smoking status, micro albumin, and hemoglobin A1C.

One dependent variable of interest is the lifestyle practices in relation to the self-management of diabetes. Wagner (1996) described self-managers as being able to engage in activities that encourage healthy practices and build effective coping mechanisms as well as interact with health care providers and adhere to a recommended medical regimen. Self-managers are also able to monitor and manage their own physical and emotional status, and cope with the impact of the illness socially, emotionally, and mentally (Wagner). The American Association of Diabetes Educators (2009) purported that self-managers focus on seven specific behaviors to effectively handle their chronic condition. This association suggested lifestyle changes in the following areas: Eating, being active, monitoring, taking medication, problem solving, reducing risks, and healthy coping.

Another dependent variable that will be examined in this study is whether perceptions of care correlate with management of diabetes. It is expected that patients with a positive perception of care, as outlined in the Chronic Care Model, will have better management and control of their diabetes. This model is a direct reaction against the traditional care system in which the post-discharge care system operates almost exclusively on medical issues, is organized around care provided by separate programs and providers, is focused on responding to crisis events and management of disease, and frequently ignores the interests of the people to be served (Bringewatt, 2003). The Chronic Care Model, on the other hand, endorses a paradigm shift in which the care system includes provider-oriented components such as continuing education or physician feedback, organizational changes in personnel and management of visits and follow-ups, information systems changes, and patient oriented interventions of an educational or supportive nature (Wagner et al., 2001).

Diabetes self-efficacy is a variable that will be examined during this study. Self-efficacy is operationally defined as "the individual's judgment of confidence to carry out tasks specific to diabetes management" (Rapley, Passmore, & Phillips, 2003, p. 289). Patients who are not strong believers in their ability to successfully advocate for themselves and manage the multidimensional requirements of a chronic illness will likely fall short in being able to maintain wellness despite the limitations of their diabetes.

The physiological factors (blood pressure, cholesterol level, smoking status, and hemoglobin A1C) will be analyzed for unfavorable scores/statues in these areas will increase the severity and likelihood of complications. HbA1c is a test that measures the amount of glycosylated hemoglobin in a person's blood. Glycosylated hemoglobin is a molecule in red blood cells that attaches to glucose (Hurb, 2007). There is more glycosylated hemoglobin if there

is more glucose in the blood, and the test gives an estimate of how diabetes is being managed over a 2 to 3 month period.

Conclusion

Chronic illnesses, particularly diabetes, have devastating effects on the individual and these effects include problems such as depression, loss of functioning, and independence. Such illnesses affect the family and caregivers and have a negative effect on issues such as finances, family roles, and marital relationships. These debilitating factors place a greater demand on the health care system that is currently in place. Besides the quantity of health professionals, the care system is attempting to implement a multidimensional approach to service, the Chronic Care Model.

CHAPTER III

METHODOLOGY

Introduction

Chronic illness is characterized as a frequent recurrence of symptomology over time, with symptoms slowly progressing in severity (Hurd, 2007). Once diagnosed, individuals face life altering and even life threatening circumstances. Today, chronic diseases, such as cardiovascular disease, cancer, and diabetes, are among the most prevalent, costly, and preventable of all health problems (Centers for Disease Control, 2005). Seven of every 10 Americans who die each year, or more than 1.7 million people, die of a chronic disease (Centers for Disease Control).

This study focused on Type 2 diabetes which is a disease marked by high levels of blood glucose resulting from defects in insulin production, insulin action, or both (U.S. Department of Health, 2007). Participants in this study were individuals who have Type 2 diabetes. Type 2 diabetes typically begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce it.

How care management and patient self-care can be integrated into a primary care practice remains a challenge as the health care system adopts these new models of care. This study examined the use of counselors using the Motivational Interviewing Model as their guiding theory in a primary care practice interacting with persons with poorly controlled Type 2 diabetes. To implement this study, medical charts were used to collect information regarding the status of the subjects' diabetes management skills. There were 21 patients who agreed to participate in the project. Once consent was received, the participants completed the following questionnaires: (1) Diabetes Self-Management Report Tool. This questionnaire asked questions regarding the

management of the subjects'diabetes. (2) Patient Assessment of Chronic Illness Care Questionnaire. This information let us know what the patients' understanding is of the quality of care received from their nurses and physican. (3) Diabetes Self-Efficacy Scale. This questionnaire revealed the patients' level of belief in their ability to take care of themselves with their diabetes. It took approximately 45 minutes to an hour to complete the questionnaires. After completing the questionnaires, the patients were asked to meet weekly with a care manager who helped them with managing their diabetes. Using methods proposed by the Motivational Interviewing model, counselors co-created a treatment plan with the patients that addressed both medical outcomes and lifestyle practices related to management of diabetes. From that plan, counselors endeavored to aid clients in exploring and resolving ambivalence, as well as attempted to elicit change in clients' maladaptive lifestyle practices and in level of compliance to their medical regimen.

Purpose

This study had the following purposes: (a) to explore the perceptions of care of health care providers (i.e., physicians) and persons with diabetes; (b) to evaluate the link between patients' perceptions of care received and how well patients manage their diabetes; (c) to examine the change in lifestyle practices related to management of diabetes; (d) to measure diabetes self-efficacy of the patients in managing diabetes; and (e) to assess the degree of improvement in self-management behaviors and medical outcomes (outlined on scorecards) in persons with poorly controlled diabetes as a result of participation in intervention.

Research Design

The study utilized a quasi-experimental approach in that subjects were not randomly assigned into an experimental and a control group. Rather, the pre- and post-treatment effects of

the Motivational Interviewing intervention were measured among patients that participated in the diabetes self-management program. Baseline and results data were gathered through the use of four surveys administered before and after the intervention.

There were three quantitative instruments administered to the patients: The Diabetes Self-Efficacy Scale (DSE), the Diabetes Self-Management Assessment Tool (D-SMART), and the Patient Assessment of Chronic Illness Care (PACIC). The Patient Assessment of Chronic Illness Care was adapted and given to the participating physicians to assess their perception of care given by their health care team. The fourth assessment tool was the Diabetes Scorecard. The scorecard was created for patients based on information generated from their electronic health record. The data collected for the scorecard were the patients' weight, blood pressure, smoking status, hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations. These assessments were administered to clients prior to the start of the intervention and again following the treatment, and were scored by the counselors.

The treatment intervention was provided by master's and doctoral level counselors. During the first session, counselors facilitated a structured interview (Appendix B) to discuss outcomes and implications of the results of the assessments. During that session, the counselors and patients collaborated to develop a care plan (Appendix C) for the remainder of the intervention. Follow-up sessions were held weekly during which the counselors and patients discussed topics such as feelings surrounding management of diabetes, scheduling routine lab work (e.g., glucose and cholesterol checks), making lifestyle changes (e.g., exercise, diet, stress management) and, scheduling screenings (e.g., eye and foot exams) and vaccinations (e.g., flu, pneumonia). To conclude the program, counselors re-administered the three assessments to evaluate whether the patients' scores had been affected by the intervention. A new Diabetes

Scorecard was also developed to measure whether the patients improved in their weight management, blood pressure, smoking status (if applicable), hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations. Throughout the entire program, counselors engaged the patients during sessions based on the Motivational Interviewing Model.

The Motivational Interviewing Model was used to develop the protocol for the initial interview and was used as a basis on which to conduct follow-up sessions. Adapted from Bodenheimer, MacGregor, and Sharifi (2005), questions outlined on the initial session protocol included (1) I received the results of your Diabetes Scorecard, is there a section that you would like to discuss? (2) Using a scale of 0 to 10, with 0 meaning "it is not important," and 10 meaning "it is most important," how important is it to you to change this behavior? (3) Using a similar scale of 0-10, with 0 meaning "aren't sure at all" and 10 meaning "you are 100 percent sure," how confident are you that you can change this behavior? (4) What would it take to increase your confidence score? (5) Would you like to set a short-term goal pertaining to improving this section of concern? See Appendix B for a detailed protocol.

Research Questions

One

Is there a significant difference in patients' and physicians' perceptions of care as measured by the Patient Assessment of Chronic Illness Care (PACIC)?

Two

Is there a significant difference in patients' perception of care, as measured by the PACIC, after completing the Motivational Interviewing intervention?

Three

Is there a significant difference in patients' diabetes self-management, as measured by the DSMART, after completing the Motivational Interviewing intervention?

Four

Is there a significant difference in patients' level of diabetes self-efficacy, as measured by the Diabetes Self-Efficacy Scale, after completing the Motivational Interviewing intervention?

Five

Is there a significant difference in patients' overall diabetes health, as measured by the Scorecard, after completing the Motivational Interviewing intervention?

Hypotheses

1. Is there a significant difference in patients and physicians perception of care as measured by the Patient Assessment of Chronic Illness Care (PACIC)?

    a. (H_1) There will be a significant difference in perception between patients and their physicians, of the care provided.

    b. (H_2) Physicians will report delivering care that configures more to the Chronic Care Model than persons with poorly controlled diabetes will report receiving.

2. Is there a significant difference in patients' perception of care, as measured by the PACIC, after completing the Motivational Interviewing intervention?

    a. (H_3) Patients will have a more positive perception of the care received from their primary care practice after completing the Motivational Interviewing intervention. .

3. Is there a significant difference in patients' diabetes self-management, as measured by the DSMART, after completing the Motivational Interviewing intervention?

    a. (H_5) Patients' management of their diabetes will increase as a result of their participation in the MI intervention.

4. Is there a significant difference in patients' level of diabetes self-efficacy, as measured by the Diabetes Self-Efficacy Scale, after completing the Motivational Interviewing intervention?

    a. (H_6) Patients' level of self-efficacy in managing diabetes will increase as a result of their participation in the MI intervention.

5. Is there a significant difference in patients' overall diabetes health, as measured by the Scorecard, after completing the Motivational Interviewing intervention?

    a. (H_7) Following the intervention, there will be a statistically significant improvement on the overall score on the Scorecard.

Study Setting

The study was based in an academic family practice located in the Hampton Roads area of Virginia. The intervention was implemented between the months of September 2009 through March 2010. Initial meetings were made at the family practice and in the patients' homes. Subsequent sessions took place in the home of the clients, at the family practice, and were conducted in person or on the telephone.

Participants

Twenty-one patients with diabetes with an A1C of 9 or higher consented to participate in the study. The sample was purposefully selected from a physician generated database output. Patients meeting this criterion were sought due to the fact that the American Diabetes Association encourages people with diabetes to aim for an A1C or 6.5 or lower. It has been found that chronically high blood glucose levels is linked with heart, kidney, and eye damage, as well as, stroke and lower brain function (Blood Sugar Management: Testing, 2010; DCCT and EDIC: The Diabetes Control and Complications Trial and Follow-up Study, 2008). It has also been found that for every point the A1C level is lowered, the lower the risk of developing a variety of complications: Eye disease risk is reduced by 76%; kidney disease risk is reduced by 50%; nerve disease risk is reduced by 60%; any cardiovascular disease event risk is reduced by 42%; nonfatal heart attack, stroke, or risk of death from cardiovascular causes is reduced by 57% (DCCT and EDIC: The Diabetes Control and Complications Trial and Follow-up Study, 2008).

Twenty-five physicians working with persons with poorly controlled diabetes and the general family practice population were solicited for the study. Physicians included were both

medical residents and faculty. Those selected were from a pool of physicians recruited from Eastern Virginian Medical School (EVMS). This medical school partners with local clinics, hospitals, and physicians in the neighboring region.

Variables

The variables in this study included perceived resources and barriers to self-management, perceptions of care, self-efficacy, blood pressure, cholesterol level, smoking status, and hemoglobin A1C. The researchers, however, anticipated that there were confounding variables that would hinder improvement in outcomes. For instance, the age and race of participants, the availability of transportation to referral sites, and the variability and impact of additional medical conditions could cause difficulties and interfere with progress toward better self-management. Although those variables were not the focus of the study, data was collected and analyzed to measure their effects.

The intervention method that was utilized in this study was the Motivational Interview (MI) Model. Motivational Interviewing, which has been described in detail by Emmons and Rollnick (2001), has been defined as a directive, client-centered counseling process for eliciting behavior change by helping clients explore and resolve ambivalence. The general principles for interviewers to follow include the following: (1) expressing empathy, by use of reflective listening; (2) developing discrepancy between client goals and current problem behavior by use of reflective listening and objective feedback; (3) avoiding argumentation by assuming that the client is responsible for the decision to change; (4) rolling with resistance, rather than confronting or opposing it; and (5) supporting self-efficacy and optimism for change.

Instrumentation

Diabetes Self-Management Report Tool

The Diabetes Self-Management Report Tool (D-SMART) (Peeples, Mulcahy, Tomky, Weaver, 2001) assesses a patient's desire to change, self-management goals, and current behaviors. Peyrot, Peeples, Tomky, Charron-Prochownik (2007, p. 823) conducted psychometric tests and reported the following regarding the D-SMART:

High test-retest reliability was demonstrated, with 97% of the responses not significantly different between administrations of the instrument. This finding indicates that responses remained stable in the absence of interventions to produce changes. Inter-item consistency was measured by Cronbach α for questions within the living with diabetes domain; reliability was modest (0.6 to 0.8 depending on the number of items included). Responsiveness of the D-SMART was measured by evaluating response percentages on the second (prior to intervention) and third administration (at least 2 weeks after the intervention) and analyzed in the aggregate and in subpopulations desiring a specific change. The analysis indicated that the questions and response categories in the D-SMART were sensitive enough to detect behavior changes for each outcome area (Peyrot et al., 2007).

For the purposes of this study, the researcher used the section of the instrument that measure patients' behavior over the past three months. The investigator created seven scales which were used to assess whether the patients' behaviors had changed as a result of the intervention. The seven scales created were: (1) Exercise/Physical Activity; (2) Eating; (3) Medication; (4) Problem Solving High Blood Sugar; (5) Problem Solving Low Blood Sugar; (6) Monitoring; and (7) Living with Diabetes. However, high scores on all scales, except Livingwith Diabetes, are indicative of management positive behaviors. For instance, there were questions on the instrument such as, how often do you miss or skip a meal or scheduled snack? The answer selections were daily, several times a week, few times a month, once in a while, and never. An

answer of 'daily' was given a score of one and 'never,' a score of five; therefore, a patient who had a high score had good self-management habits on the assessed behavior. However, on the Living with Diabetes scale, it was asked how much various situations interfered with management of diabetes. The answer selections were a lot, some, a little, and not at all. A value of four was given to 'a lot' and 'not at all' was equal to one, meaning a patient with a high score was experiencing many disruptions to their daily management of diabetes.

The Exercise/physical activity scale assesses the frequency, duration, and type of exercise done by patients. On this scale, a participant can score a minimum of 1 and a maximum of 12 with higher scores showing that the patient has an appropriate exercise regime in place. On the eating scale, frequency and types of foods are assessed. The maximum score is 15 and the minimum score is 3. The medication scales measures the type and level of compliance patients have to their physician's suggested treatment plan. This highest score possible is 14 and the minimum is 4. On the problem solving with high blood and low blood sugar scales, patients' skill level in handling high and low glucose levels are measured. A high score is 6 and low score is 2. Lastly, on the living with diabetes scale, patients' emotions regarding their condition, and the affect it has on their life is evaluated. 40 is the highest score to be obtained and 10 is the lowest.

Patient Assessment of Chronic Illness Care

The Patient Assessment of Chronic Illness Care (PACIC; MacColl Institute for Healthcare Innovation, 2009) is a brief assessment which examines the extent to which a patient with chronic illness receives care that aligns with the Chronic Care Model (CCM)—measuring care that is patient-centered, proactive, planned, and includes collaborative goal setting, problem-solving, and follow-up support. This tool was given to patients, and was also adapted and

administered to the participating physicians to measure their perceptions of whether they were providing care according to the Chronic Care Model. This instrument was used to determine perceptions of care.

The instrument has five subscales: (1) Patient Activation; (2) Delivery Systems Design/Decision Support; (3) Goal Setting; (4) Problem-solving/Contextual Counseling; and (5) Follow-up/Coordination.

Patient Activation measures the extent to which the patient's feedback was solicited and considered in developing a treatment plan. This subscale consists of items 1-3. A 5-point Likert type scale is used. Scores can range from 3 to 15 with higher scores indicating a higher level of patient activation.

The Delivery System Design/Decisions Support subscale assesses the level of organization with which the health care team offers services and the extent to which it supports the patients decisions in managing diabetes. This subscale consists of items 4-6. A 5-point Likert type scale is used. Scores can range from 3 to 15 with higher scores indicating a higher level of organization and support.

Goal Setting in this assessment measured the frequency of which the health care team facilitated goal-setting practices in the patients. This section of the assessment consists of items 7-11. A 5-point Likert type scale is used. Scores can range from 5 to 25 with higher scores indicating a greater frequency for the health care team to encourage goal setting habits.

The Problem Solving/Contextual Counseling subscale measures the frequency with which the health care team considers the context of a patient's lifestyle when suggesting a treatment regimen and the extent to which they aid the patient in preparing for challenges in managing their diabetes. This subscale consists of items 12-15. A 5-point Likert type scale is

used. Scores can range from 4 to 20 with higher scores indicating a higher level of problem solving and contextual counseling among the health care team.

The fifth subscale, Follow-up/Coordination, measures the continuance of care the patients receives outside of the primary care practice and how often the health care team connects patients to necessary specialists. This subscale consists of items 16-20. A 5-point Likert type scale is used. Scores can range from 5 to 25 with higher scores indicating a higher level follow-up and coordination.

In scoring the full inventory on a Likert type scale, scores can range from 20 to 100 if the patients answer all questions. Higher scores indicate a greater extent to which a patient with chronic illness receives care that aligns with the Chronic Care Model (CCM)—measuring care that is patient-centered, proactive, planned, and includes collaborative goal setting, problem-solving, and follow-up support.

Diabetes Self-Efficacy Scale

The Diabetes Self-Efficacy Scale (Hurley and Shea, 1992) is used to assess "the individual's judgment of confidence to carry out tasks specific to diabetes management" (Rapley et al., 2003, p. 295). Rapley purported that this scale has sound psychometric data: "the scale is reliable over time, supported by factor analysis and is of relevance to individuals with diabetes" (Rapley et al., p. 295).

The inventory has five subscales: (1) Diet; (2) Self-Treat; (3) Routines; (4) Certainty; and (5) Exercise. Each scale is scored on a 6-point Likert type scale ranging from strongly agree to strongly disagree. To score the inventory, it is necessary to reverse order the positive items before starting the analysis (i.e. all except 3, 4, 7, 8, 11) to indicate higher scores mean greater task-specific confidence.

The Diet subscale in this inventory assesses the patients' belief in their ability to abide by their diabetic diet. This scale consists of items 5, 6, 9. Scores can range from 3 to18 with higher scores indicating a stronger belief in their ability to abide by their diabetic diet.

Self-treat is another subscale and it measures the patients' belief in their ability to maintain healthy practices and manage complications (e.g., self-examinations and blood glucose levels). This scale consists of items 12, 13, 14, 15, and 16. Scores can range from 5 to 30 with higher scores indicating a stronger belief in their ability to maintain healthy practices and manage complications.

The Routines subscale assesses the patients' belief in their ability to incorporate their diabetic treatment regimen in to their lifestyle. This scale consists of items 1, 2, 17, and 18. Scores can range from 4 to 24 with higher scores indicating a stronger belief in their ability to incorporate their diabetic treatment regimen in to their lifestyle.

The Certainty subscale measures the patients' level of uncertainty in being a successful manager of their diabetes. This scale covers items 3, 4, 7, and 8. On this scale, score range from 4 to 24 with higher scores signifying a stronger level of uncertainty in successfully managing their diabetes.

Exercise is a subscale that evaluates the patients' belief in their ability to exercise. This scale consists of items 10 and 11. Scores can range from 2 to 12 with higher scores indicating a stronger belief in their ability to exercise.

The overall score for this instrument can range from 18-108 and responses are based on a 6-point Likert type scale. The higher the score, the greater the patients' confidence is in being able to carry out diabetes related activities—diabetes self-efficacy.

Diabetes Health Survey Scorecard

The Diabetes Health Survey Scorecard, based on the National Committee for Quality Assurance's (NCQA), was created by the medical staff of the EVMS family practice, and includes data collected from patients' medical records as well as self-reported by the participants. A Diabetes Scorecard was generated from the results and used as a baseline during the counseling sessions. Included in the scorecard were patients' weight, blood pressure, smoking status, hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccination rates.

Data Analysis

Notice of approval for this study was received July 21, 2009 from the Eastern Virginia Medical School Subjects Review Board allowing for the commencement of data collection period. The data collected was analyzed using a Repeated Measure t-tests. This analysis of related measures involves a comparison of means from the pre- and posttest and focuses on the differences between the scores (Salkind, 2007).

CHAPTER IV

RESULTS

Introduction

The results of the Motivational Interviewing intervention are presented in this chapter. A brief overview of the study is outlined. Next, details regarding the process undertaken to recruit participants, train care managers, and implement the intervention are discussed. Finally, an explanation of the statistical analysis of the data collected are presented.

This study analyzed the effectiveness of counselors serving as care managers to patients with poorly controlled Type 2 diabetes. During Phase 1 of the study, the following groups were solicited to participate in this six month study: Patients with a hemoglobin A1C of 9 or greater; master's and doctoral-level counseling graduate students; and physicians working with persons with diabetes in the general family practice population. The counseling graduate students who served as care managers were trained regarding the course of diabetes and the recommended treatment for diabetes patients, as well as the Motivational Interviewing model, and how to advocate for their patients.

For Phase 2, patients completed pre assessments and physicians were given a modified version of an assessment taken by the patients. The following assessments were used: (1) the Diabetes Self-Management Report Tool. This questionnaire asked questions regarding the management of the subjects'diabetes; (2) the Patient Assessment of Chronic Illness Care Questionnaire. This instrument collected information regarding the patients' understanding of the quality of care received from their nurses and physican; (3) the Diabetes Self-Efficacy Scale; and (4) the Diabetes Scorecard. The scorecard was created for patients based on information generated from their electronic health record. The data collected for the scorecard included the

patients' weight, blood pressure, smoking status, hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations.

During Phase 3, the care managers met with their assigned patients on a weekly basis for six months. They discussed feelings surrounding management of diabetes, scheduling routine lab work (e.g., glucose and cholesterol checks); making lifestyle changes (e.g., exercise, diet, and stress management); scheduling screenings (e.g., eye and foot exams); vaccinations (e.g., flu, pneumonia); and referrals to necessary health professionals (e.g., diabetes educators, ophthalmologists). During that time period, care managers received weekly supervision from a multidisciplinary team of health professionals to ensure that they complied with the study protocol, as well as to offer guidance, support, and instruction.

During Phase 4 of the study, the instruments were re-administered to assess the effect of the Motivational Interviewing intervention and the data were analyzed using the Statistical Package for Social Sciences.

Phase One

To begin the process, a recruitment letter (Appendix D) was sent via email to master's and doctoral level counseling students outlining the purpose, participation requirements, and benefits of the study. In addition to the email, the researcher also visited internship supervision groups to market the program. The original study design called for 10 counselors to serve as case managers; however, only five students agreed to participate. Once the students accepted the invitation to participate in the study as care managers, they attended a two-day training workshop.

The workshop was conducted by a physician, a licensed psychologist, a diabetes educator, a nutritionist, a pharmacist, and me. I explained the purpose, overview, and logistics of

the program, as well as the function and administration of the assessment tools. The physician trained the counselors regarding the course, recommended treatment, and risk factors associated with diabetes. The licensed psychologist provided training on behavior change and the use of Motivation Interviewing with patients with diabetes. Initially, a Motivational Interviewing trainer from Miller and Rollnick's Network of Trainers (MINT) was scheduled to complete this portion of the training program; however, financial constraints of the project prohibited use of their services. Explanation of the role of diabetes educators and diabetes management tools available to patients was presented by the certified diabetes educator, who was also credentialed as a registered nurse. The doctor of pharmacy trained the care managers on the medications often used to treat diabetes and on how common side effects of diabetes often interfere with patients' daily living. Further information was given on the high cost of the medications and on reduced fee prescription drug programs available in the local community and online. The nutritionist, certified as a diabetes educator and registered as a dietician, provided training on meal planning, portion size, and the importance of monitoring carbohydrate consumption for people with diabetes.

To reinforce and assess the information retained, counselors were assigned partners and participated in mock sessions where one partner would role play as the patient with diabetes and the other, the care manager. The counselor was given a sample set of surveys (including the DSMART, the Diabetes Self-Efficacy Scale, and the Patient Assessment of Chronic Illness Care) and a scorecard. They were instructed to review and score the tools and then conduct the meeting and co-develop the Care Plan as if it were the opening session with the patient.

In regards to patient recruitment, the research team received an output generated from a physician database listing 133 patients who had A1C's of 9 or greater. The team called each of

the patients using a protocol for recruitment calls (Appendix E) to attempt to ensure standardized interactions. To assist in recruitment measures, I met with all of the physicians and the nurses of the practice to make them aware of the study and to encourage them to refer their patients to the program. Also, flyers advertising the program were posted in the practice. All patients who were contacted were asked to visit the practice to learn more about the program, and if interested to complete the consent form and pre intervention surveys. Those sessions were conducted by the care managers and the researcher. The initial study protocol outlined an experimental design, projecting that 50 subjects would be recruited; 25 would be placed in treatment group and 25 in the control group. However, only 33 patients agreed to visit the practice and only 21 agreed to follow through with the program. Although participants were recruited from a pool of patients with an A1C of 9 or greater, many of the study participants' blood sugar had dropped to less than 9 by the time they had begun the study.

Patients who did not agree to participate in the program were asked for their rationale. The most commonly stated reason was that they did not want to commit to a six month period. Some did not want to be called, to visit, or be visited on a weekly basis, while others felt as though they had already tried and were unsuccessful at programs such as this, or simply not interested in making changes at that time.

Since there were not enough patients to divide into control and experimental groups, all patients were assigned a care manager and the plan for a control group was deleted from the research project. The Human Subjects Board of Eastern Virginia Medical School was petitioned for an amendment to the research plan. The change was approved and an amended consent form was drafted.

There were 12 patients who completed the entire program. Those participants' data were included in the data analysis detailed below. Of the 21 who started, 17 were female, 4 were male, and they ranged in age from 28-79. There were 12 African Americans, and nine Caucasians. Regarding education, 15 completed high school, and 12 reported having completed some college. Of 12 who completed the program, two were males and 10 were females. Four were Caucasian, eight were African American, they ranged in age from 36-79, and all had completed high school. The demographics of the sample in this study are parallel to the demographics of patients with diabetes presented previously, which were based on the data released by the Centers for Disease Control and Prevention (2007). There is a greater prevalence of diabetes among the elderly and among minorities. In essence, the following presentation of results could be generalized to the larger population of persons with diabetes.

To assess the link between patient and physician perception of care provided for chronic illnesses, physicians were recruited to complete a revised version of the Patient Assessment of Chronic Illness Care (Appendix F). Of the 25 physicians who were solicited by their peer, the physician who was also a part of the research team, 16 completed the revised survey.

Phase Two

The patients who consented to participate were then asked to complete the study's surveys: the Diabetes Self-Management Assessment Report, the Diabetes Self-Efficacy Scale, and the Patient Assessment of Chronic Illness Care. Participants met with care managers at the family practice to complete the surveys, sign consent forms, and get their A1C's tested. The care managers administered the instruments, assisting those who had impaired vision or other hindrances. The interested patients who could not attend the admission sessions requested to have the surveys either faxed or emailed, and they visited the practice at a later date to take their

A1C test. At the close of each intake, the patients were asked their availability for their follow-up appointments. Upon collection of all pre intervention data, the care managers were assigned cases based on whose schedules matched with those of the patients.

The data collected for the Diabetes Scorecard were the patients' weight, blood pressure, smoking status, hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations. This information was gathered from the electronic medical record by the medical staff of the practice. Neither the researchers nor the care managers had direct access to the electronic records due to HIPPA restrictions.

The revised Patient Assessment of Chronic Illness Care was distributed to the physicians within the practice by the physician on the research team. The research team physician also collected and submitted the instruments for analysis. This method of administration was chosen because the research team physician had the most efficient line of access to the consenting physicians.

Phase Three

Once patients were assigned a care manager, they decided on the method of the weekly meetings. They had the choice of meeting face-to-face either at the family practice or in the patients' home, or by telephone. Before the initial session, the counselors scored the instruments to have a foundation upon which to structure the meeting. To facilitate the discussion regarding the outcomes and implications of the results, they followed the structured interview protocol (Appendix B), which was grounded in the methods proposed by the Motivational Interviewing model. During the session, the counselors and patients collaborated to develop a Care Plan (Appendix C). The Care Plan gave the patients the options to address completing overdue lab tests or screenings (e.g., cholesterol or foot exams), making appointments with medical or other

needed management professionals (e.g., diabetes educator or social worker), or making lifestyle changes (e.g., lose weight or develop coping mechanisms). Patients and care managers referenced the Care Plan for the remainder of the intervention.

Every week, the care managers checked in on the patients' goals, as well as allowed the patients to process any feelings surrounding balancing the management of diabetes with other life situations or circumstances. The care managers served as advocates and provided resources when necessary to aid in removing or overcoming barriers to receiving treatment or self-management. To equip the care managers for their role, they were provided tools such as list of local diabetes management programs from the local office of the American Diabetes Association, area hospitals, community services boards, YMCA's, and clinics. Such resources became pertinent for one patient in particular who was a victim of a natural disaster and lost her home. Her care manager was not only available to aid in processing her loss, and provide links for management (e.g., temporary supply of medication), but was able to assist her in obtaining other necessities, such as housing.

Throughout the study, there were several challenges that had to be tolerated and overcome. The retention of patients was one of the most significant obstacles to maintaining the study. Although the study's protocol was revealed in all recruitment materials, some participants were unwilling to meet face-to-face and wanted to meet only via telephone. This became difficult particularly when patients' phone numbers changed or services were disconnected. Three of the six patients who dropped out of the study had done so by the second month of the program because of changed contact information. The other half simply stopped answering the telephone and stopped returning the care managers' messages. To attempt to reconnect with patients, a contact letter (Appendix G) was sent to study participants at the end of November

encouraging clients to rejoin efforts with their care managers. Given that the study took place from September, 2009 to March, 2010, the holiday season and the academic winter break became another obstacle. Since the research team anticipated this challenge, each care manager consulted with their patient son how they would like to maintain contact over the holidays. To encourage healthy choices throughout the season, a Holiday Survival Kit (Appendix H) was mailed out to all patients. The kit gave tips on meal planning, menus, preparing for travel, exercise, consuming alcoholic beverages, and dealing with stress. To accommodate the care managers and patients during the academic winter break, the counseling graduate students who served as care managers were offered additional support and access to the research team's medical professionals and were encouraged to refer patients to the researcher, the physician, or clinical psychologist while they were on vacation if the patient needed immediate assistance.

Care managers met weekly for interdisciplinary supervision sessions. Commonly in attendance were the physician, the licensed psychologist and me. Several issues arose during the supervision meetings that prompted consultation with individuals knowledgeable about diabetes management. Patients' nurses, and physicians, as well as the diabetes educator and doctor of pharmacy were consulted to ensure proper treatment and guidance was giving for subjects with diabetes involved in the program. It was difficult to arrange the weekly supervision meetings for all of the care managers. Three of the five care managers were first semester doctoral students when they consented to being a part of the study. Their obligations were not as rigorous during the first semester as they were the second semester. This transition to greater responsibility influenced the care managers' attendance rates. The master's level care managers were full-time employees and counseling graduate program interns, as well as participants in this study. Therefore, students were given the option of teleconferencing into the supervision session when

they were not able to attend in person. Care managers were also given the option of alerting the research team of their absence prior to the scheduled supervision. In that event, I conferred with students who were serving as care managers before the meeting and acted as their intercessor using the written update they provided for the supervision session. There were also times when I met individually with care managers post supervision to relay information discussed at the meetings to ensure that both the patient and care manager received optimal, standardized support. Care managers were also encouraged to increase direct communication with patients' physicians and nurses to avoid misinformation or treatment that was not standardized which might occur if there were a prolonged lack of supervision.

Phase Four

Starting in February, the care managers were advised to begin the termination process with their patients, to make certain that both parties were given ample time to adjust to the closing of the study. The care managers encouraged patients to stay motivated in continuing the self-advocate and self-management skills that were modeled. The physician and I instructed the counselors to let the patients know that staff at the family practice would remain available to aid in problem-solving any future obstacles. The family practice had already begun using the premise and materials of this study and mission of the Patient-Centered Medical Home to implement a program which is due to start during the summer of 2010.

During the month of March, care managers began to schedule patients to come in for post-assessment data collection, which consisted of another A1C blood test, administration of the various study surveys, and development of a post-intervention Diabetes Scorecard. Challenges arose with this process as well. The major difficulty was getting the patients to come to the practice for the A1C posttest. Many of the patients had come in for routine appointments with

their physicians in January and February and took the A1C test during that visit. That time period was too early to have it added to the post data, as the protocol outlined a six month intervention. Some patients were in the routine of meeting by telephone, and had problems with transportation or their work schedules when they attempted to schedule an office appointment. Others had personal emergencies, or there was a loss of motivation. The care managers too faced barriers during this process; many were balancing work, school, personal and professional commitments along with the obligations of this study. Of the 16 patients who completed the intervention, 12 completed the post-survey data. However, all 16 post-intervention Diabetes Scorecards were submitted.

Data Analysis

Repeated-measures t-tests were used to evaluate whether there was a significant difference of means between the pre- and post-intervention assessments.

As a result of the small sample size and to ensure the appropriateness of the selected statistical analysis, Kolmogorov-Smirnov tests were calculated on the calculated mean difference scores. That test revealed whether the differences in patients' pre- and post-intervention mean scores were normally distributed in the population. These steps were necessary because the condition of normality of the sample distribution must be satisfied in order to achieve valid repeated measures t-test results (Green & Salkind, 2008).

Analysis of Patients' Diabetes Self-Management

A repeated-measures t-test was used to assess for a significant difference of means of the subjects' management of diabetes as measured by pre-and post-administration of the Diabetes Self-Management Assessment Report Tool (DSMART). High scores on all subscales, except the Living with Diabetes subscale, are indicative of management positive behaviors. Pre- and post-

intervention means and t-test results for the overall DSMART instrument and for all sub-scales are depicted in Table 3 below.

Table 3.
Diabetes Self-Management Assessment Report Tool

Scales	*n*	Pre-test *M*	Post-test *M*	*t*	*p*
Overall	8	241.37	245.25	.603	.566
Eating	10	20.60	20.10	-.711	.495
Exercising	9	21.11	23.56	1.63	.142
Medication	10	20.30	19.20	-.390	.706
Problem-Solve-High	10	25.20	26.90	1.61	.141
Problem-Solve-Low	10	26.90	28.20	.614	.555
Monitoring	10	20.50	22.80	.955	.365
Living	9	107.67	95.44	-1.521	.167

Data were first screened for normality using the Kolmogorov-Smirnov test. The Kolmogorov-Smirnov test revealed that the sample of mean difference scores for the overall DSMART followed a normal distribution ($p = .895$). Therefore, the t-test was completed on the overall scores to determine if there was a significant difference in the pre- and post-test scores. Missing values were excluded case-by-case. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 8$, $t\ (7) = .603$, $p = .566$, d=.21309). There was not a significant difference in the means, but the mean score increased after the intervention. The mean for the pre test was 241.37 and for the post test the mean was

245.25. These results suggest that the intervention was moving toward increasing participating patients' positive overall self-management behaviors.

There are seven subscales on the DSMART: Exercise/physical activity, Eating, Medication, Problem-solving high blood sugars, Problem-solving low blood sugars, Monitoring, and Living with diabetes. The Kolmogorov-Smirnov test was completed on each of the subtests to check for normality of the sample distribution. Results revealed that all of the sample mean difference scores followed a normal distribution (See Appendix I). Therefore, repeated-measures t-tests were completed for the subtests to determine specific differences in diabetes management behaviors.

On the Eating subscale, frequency and types of foods are assessed. Missing values were excluded case-by-case. The pre-test mean was 20.60 and the post-test mean was 20.10. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 10$, $t\ (9) = -.711$, $p = .495$, $d = .22486$). Furthermore, the mean scores decreased after the intervention. These results suggest that the intervention did not contribute to increasing participating patients' positive eating behaviors.

The Exercise/physical activity scale assesses the frequency, duration, and type of exercise completed by patients. Missing values were excluded case-by-case. The pre-test mean was 21.11 and the post-test mean was 23.56. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 9$, $t\ (8) = 1.629$, $p = .142$, $d = .54284$). However, the mean scores increased after the intervention. These results suggest that, although the change in behavior was not significant, patients' participation in the intervention did have a positive impact on their exercising behaviors.

The Medication scale assesses the type and level of compliance patients have to their physician's suggested treatment plan. Missing values were excluded case-by-case. The pre-test mean was 20.30 and the post-test mean was 19.20. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores (n = 10, t (9) = -.390, p = .706, d = .12325). Furthermore, the mean scores decreased after the intervention. These results suggest that the intervention did not contribute to increasing participating patients' positive medication management behaviors.

The Problem-solving high blood sugar scale assesses patients' skill level in handling high glucose levels. Missing values were excluded case-by-case. The pre-test mean was 25.20 and the post-test mean was 26.90. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores (n = 10, t (9) = 1.612, p = .141, d = .50975). However, the mean scores increased after the intervention. These results suggest that, although the change was not significant, patients' participation in the intervention did have a positive impact on their management of their blood sugar levels.

The Problem-solving low blood sugar scale assesses patients' skill level in handling low glucose levels. Missing values were excluded case-by-case. The pre-test mean was 26.90 and the post-test mean was 28.20. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores (n = 10, t (9) = .614, p = .555, d = .19401). However, the mean scores increased after the intervention. These results suggest that, although the change in behavior was not significant, patients' participation in the intervention did have a positive impact on their low-blood sugar problem-solving behaviors.

The Monitoring scale assesses the patients' ability to track their blood sugar levels. Missing values were excluded case-by-case. The pre-test mean was 20.50 and the post-test mean

was 22.80. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores (n = 10, t (9) = .955, p = .365, d = .30198). However, the mean scores increased after the intervention. These results suggest that, although the change in behavior was not significant, patients' participation in the intervention did have a positive impact on their monitoring of blood sugar levels.

On the Living with Diabetes scale, patients' emotions regarding their condition and the effect it has on their life is evaluated. Missing values were excluded case-by-case. High scores indicate that daily life situations have a greater disruption on the patient's diabetes management. The pre-test mean was 107.67 and the post-test mean was 95.44. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores (n = 9, t (8) = -1.521, p = .167, d = .50687). However, the mean scores decreased after the intervention. These results suggest that, although the change was not significant, patients' participation in the intervention did have an impact on their ability to positively manage their diabetes despite life's disruptions.

Analysis of Diabetes Self-Efficacy

A repeated measures t-test was used to assess for a significant difference of means of the subjects' level of diabetes self-efficacy as measured by pre- and post-intervention scores on the Diabetes Self-Efficacy Scale (DSE). Each scale is scored on a 6-point Likert type scale ranging from strongly agree to strongly disagree, with higher scores indicating stronger belief in their ability. Pre- and post-intervention means and t-test results for the overall test and for all scales are depicted in Table 4.

Table 4.
Diabetes Self-Efficacy

Scales	*n*	Pre-test *M*	Post-test *M*	*t*	*p*
Overall	12	81.83	90.58	1.663	.125
Diet	12	12.91	13.58	.665	.520
Exercise	12	8.17	7.42	-.799	.441
Self-Treat	12	24.00	28.92	2.152	.054
Routine	12	4.83	3.08	-1.969	.075
Certainty	12	17.75	18.92	.532	.606

Data were first screened for normality using the Kolmogorov-Smirnov test. The Kolmogorov-Smirnov test revealed that the sample of mean difference scores for the overall DSE followed a normal distribution ($p = .835$). Therefore, a repeated-measures t-test was completed on the overall scores to determine if there was a significant difference in the pre- and post-test scores. Missing values were excluded case-by-case. The pre-test mean was 81.83 and the post-test mean was 90.58. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 12$, $t\ (11) = 1.662$, $p = .125$, $d = .48007$). However, the mean scores increased after the intervention. These results suggest that, although the change in diabetes self-efficacy was not significant, patients' participation in the intervention did have an impact on patients' positive level of diabetes self-efficacy.

Within the DSE, there were five subscales: Diet, Self-Treat, Routine, Certainty, and Exercise. The Kolmogorov-Smirnov test was completed for each of the subtests to check for normality of the sample distribution. Results revealed that all of the sample mean difference

scores followed a normal distribution (See Appendix I). Therefore, repeated-measures t-tests were completed on each of the subscales to determine specific differences in self-efficacy.

On the Diet subscale, the patients' belief in their ability to abide by their diabetic diet is assessed. Missing values were excluded case-by-case. The pre-test mean was 12.91 and the post-test mean was 13.58. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 12$, $t\ (11) = .665$, $p = .520$, $d = .19197$). However, the mean scores increased after the intervention. These results suggest that, although the change was not significant, patients' participation in the intervention did have an impact on their positive beliefs in their ability to diet.

The Exercise subscale evaluates the patients' belief in their ability to exercise. Missing values were excluded case-by-case. The pre-test mean was 8.17 and the post-test mean was 7.42. The repeated-measures t-test revealed that there was a not significant difference between the pre- and post-test scores ($n = 12$, $t\ (11) = -.799$, $p = .441$, $d = .23020$). Furthermore, mean scores decreased after the intervention. These results suggest that the intervention did not contribute to increasing participating patients' positive belief in their ability to exercise.

The Self-treat scale measures the patients' belief in their ability to maintain healthy practices and manage complications (e.g., self-examinations and blood glucose levels). Missing values were excluded case-by-case. The pre-test mean was 24.00 and the post-test mean was 28.92. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 18$, $t\ (11) = 2.152$, $p = .054$, $d = .62127$). However, the mean scores increased after the intervention. These results suggest that, although the change in beliefs was not significant, the intervention did have an impact on participating patients' positive belief in their ability to self-treat.

The Routine scale assesses the patients' belief in their ability to incorporate their diabetic treatment regimen in to their lifestyle. Missing values were excluded case-by-case. The pre-test mean was 4.83 and the post-test mean was 3.08. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 12$, $t\ (11) = -1.969$, $p = .075$, $d = -.56845$). Furthermore, mean scores decreased after the intervention. These results suggest that the intervention did not contribute to increasing participating patients' positive belief in their ability to adhere to their diabetes treatment routine.

The Certainty subscale measures the patients' level of uncertainty in being a successful manager of their diabetes. Missing values were excluded case-by-case. The pre-test mean was 17.75 and the post-test mean was 18.92. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 12$, $t\ (11) = .532$, $p = .606$, $d = .15347$). However, the mean scores increased after the intervention. These results suggest that, although the change in beliefs was not significant, the intervention did have an impact on participating patients' positive belief in being successful at managing their diabetes.

Analysis of Patients' Perception of Care

A repeated-measures t-test was used to assess for a significant difference of means of the subjects' perception of care as measured by pre- and post-administration of the Patient Assessment of Chronic Illness Care (PACIC). A 5-point Likert type scale is used, with answer selections ranging from 'none of the time' to 'always.' Higher scores indicate a higher level of adherence to the Chronic Care Model. Overall and subscale PACIC pre- and post-intervention means, standard deviations, and t-test results are depicted in Table 5 below.

Table 5.
Patient Assessment of Chronic Illness Care

Scales	*n*	Pre-test *M*	Post-test *M*	*t*	*p*
Overall	11	67.73	89.23	3.35	.007
Activation	12	11.25	13.25	1.82	.097
Delivery	12	10.33	14.00	3.604	.004
Goals	12	14.67	23.00	4.71	.001
Problem-Solving	11	13.55	18.18	3.54	.005
Follow-up	21	17.00	17.00	N/A	N/A

Data were first screened for normality using the Kolmogorov-Smirnov test. The Kolmogorov-Smirnov test revealed that the sample of mean difference scores for the overall PACIC followed a normal distribution ($p = .775$). Therefore, the repeated-measures t-test was completed on the overall scores to determine if there was a significant difference in the pre- and post-test scores. Missing values were excluded case-by-case. The repeated-measures t-test revealed that there was a significant difference between the pre- and post-test scores ($n = 12$, $t(10) = 3.349$, $p = .007$, d = 1.00976). The post-test mean scores $M = 89.28$, $SD = 13.58$) were higher than the pre-test mean scores ($M = 67.71$, $SD = 21.59$) revealing that the intervention significantly increased participating patients' positive perception of care received. Additionally, Cohen's d values revealed a large effect size.

There are five subscales on the PACIC: Patient Activation, Delivery System Design/Decision Support, Goal Setting, Problem-Solving/Contextual Counseling, and Follow-up/Coordination. The Kolmogorov-Smirnov test was completed for each of the subtests to check

for normality of the sample distribution. Results revealed that all of the sample mean difference scores followed a normal distribution (See Appendix I). Therefore, repeated-measures t-tests were completed for the subtests to determine specific differences in perception of care.

Patient Activation measures the extent to which the patient's feedback was solicited and considered in developing a treatment plan. Missing values were excluded case-by-case. The pre-test mean was 11.25 and the post-test mean was 13.25. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 12$, $t\,(11) = 1.817$, $p = .097$, $d = .52440$). However, mean scores increased after the intervention. These results suggest that, although the change in perception was not significant, the intervention did have an impact on participating patients' positive perception of patient activation solicited by the practice.

Delivery System Design/Decision Support subscale assesses the level of organization with which the health care team offers services and the extent to which it supports the patients' decisions in managing diabetes. Missing values were excluded case-by-case. The repeated-measures t-test revealed that there was a significant difference between the pre- and post-test scores ($n = 12$, $t\,(11) = 3.604$, $p = .004$, $d = 1.04024$). The post-test mean scores ($M = 14.00$, $SD = 1.65$) were higher than the pre-test mean scores ($M = 10.33$, $SD = 3.17$). These results reveal that the intervention did significantly increase participating patients' positive perception of the delivery system design/decision support of the practice. Additionally, Cohen's d values reveal a large effect size.

Goal-Setting in this assessment measured the frequency of which the health care team facilitated goal-setting practices in the patients. Missing values were excluded case-by-case. The repeated-measures t-test revealed that there was a significant difference between the pre- and

post-test scores (n = 12, t (11) = 4.713, p = .001, d = .36333). Post-test mean scores (M = 23.00, SD = 3.05) were higher than pre-test mean scores (M = 14.67, SD = 6.39). These results reveal that the intervention significantly increased participating patients' positive perception of goal setting facilitation of the practice. Additionally, Cohen's d values reveal a medium effect size.

The Problem Solving/Contextual Counseling subscale measures the frequency with which the health care team considers the context of a patient's lifestyle when suggesting a treatment regimen and the extent to which they aid the patient in preparing for challenges in managing their diabetes. Missing values were excluded case-by-case. The repeated-measures t-test revealed that there was a significant difference between the pre- and post-test scores (n = 11, t (10) = 3.541, p = .005, d = 1.06775). The mean scores for the pre test (M = 13.55, SD = 4.41) and post test (M = 18.18, SD = 2.64) reveal that the intervention significantly increased participating patients' positive perception of the problem solving/contextual counseling provided by practice. Additionally, Cohen's d values reveal a large effect size.

The Follow-up/Coordination scale measures the continuance of care the patients receives outside of the primary care practice and how often the health care team connects patients to necessary specialists. The Kolmogorov-Smirnov test was not calculated due to a zero value standard error of the mean. The mean difference score for this subtest was zero, therefore, the repeated-measures t-test was not calculated. The mean score stayed the same after the intervention. These results suggest that there was no movement as a result of the intervention toward increasing participating patients' positive perception follow-up/coordination solicited by the practice.

Analysis of Patients' and Physicians' Perceptions of Care

A paired-samples t-test was used to assess for a significant difference of means of the physicians' and patients' perception of care as measured by the administration of the original (given to the patients) and modified (given to the physicians, DACIC) versions of the Patient Assessment of Chronic Illness Care (PACIC). Like the PACIC, the DACIC utilizes a 5-point Likert type scale, with answer selections ranging from 'none of the time' to 'always.' Higher scores indicate that patients perceive their care to be more closely aligned with the Chronic Care Model

The paired samples t-test was conducted to test whether there was a significant difference of means between the DACIC and pre and post PACIC scores, which measured perception of care provided by the health care team. Data were first screened for normality using the Kolmogorov-Smirnov test. The Kolmogorov-Smirnov test revealed that the sample of mean difference scores for the DACIC (p = .646) and pre (p = .420) and post (p = .653) PACICs followed a normal distribution. Therefore, paired-samples t-tests were completed on the DACIC and pre-PACIC scores and the DACIC and post-PACIC scores.

Physician DACIC scores and patient pre-PACIC scores were analyzed using a paired-samples t-test to determine the differences in physician and patient perceptions of care prior to the intervention. Missing values were excluded case-by-case. The paired-samples t-test was not significant (n = 15, t (14) = -.949, p = .359). The overall mean scores for the pre-test PACIC was 68.00 and the DACIC was 61.00. Pre-intervention PACIC scores revealed that patients perceived a slightly higher level of care from physicians than physicians reported delivering. Non-significant scores suggest that, prior to the intervention, physicians and patients had similar

perceptions regarding the care provided by the practice and its adherence to the Chronic Care Model.

Physician DACIC scores and patient post-PACIC scores were analyzed using a paired-samples *t*-test to determine the differences in physician and patient perceptions of care following the intervention. The paired-samples *t*-test for post-intervention PACIC and the DACIC scores revealed that there was a significant difference between patients' and physicians' perceptions of care provided to the patient ($n = 10$, $t\ (9) = -5.283$, $p = .001$, d = 1.67053). The mean score for the post-PACIC mean score ($M = 88.70$, $SD = 14.10$) was significantly higher than the mean of the DACIC ($M = 63.00$, $SD = 6.22$). These results suggest that, after the intervention, patients' perceptions of the care they received were significantly higher than the care physicians reported providing. Additionally, Cohen's d values reveal a large effect size.

Table 6.
Doctor and Patient Assessment of Chronic Illness Care—Pre-Intervention

	n	*M*	*SD*	*t*	*p*
DACIC	15	61.80	6.39		
				-.949	.359
Pre-PACIC	15	68.00	22.79		

Table 7.
Doctor and Patient Assessment of Chronic Illness Care—Post-Intervention

	n	*M*	*SD*	*t*	*p*
DACIC	10	63.00	6.22		
				-5.283	.001
Post-PACIC	10	88.70	14.10		

Analyses of patient and physician perceptions of care prior to and following the intervention suggest that patients' perceptions of care significantly changed as a result of the

intervention. Prior to the intervention, patients' and physicians' perceptions of care were similar. Following the intervention, the means show that there was an increase in the patients' perceptions of whether the care provided adhered to the Chronic Care Model. The increase created a gap in the means between the DACIC the post-PACIC. This was also reflected in the analysis of the pre- and post-PACIC scores. In essence, the intervention positively affected how patients' viewed their health care team's approach to Patient Activation, Delivery System Design/Decision Support, Goal Setting, Problem-Solving/Contextual Counseling, and Follow-up/Coordination. Patients saw their health care team as more supportive and willing to work towards equipping their patients to become better self-managers.

Analysis of the Physiological Variables

The physiological variables consisted of the patients' weight, blood pressure, smoking status, hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations. These data were measured using the Diabetes Scorecard, with higher scores indicating positive management behaviors. Results for the physiological variables assessed for the Diabetes Scorecard are depicted in Table 8.

Table 8.
Diabetes Scorecard Results

Score Measures	Threshold (% of patients in sample)	Weight	Pre	Post
HbA1c Control > 9.0 %*	≤ 15%	12.0	52%	52%
HbA1c Control < 8.0 %	60%	8.0	24%	29%
HbA1c Control < 7.0 %	40%	5.0	4.8%	9.5%
Blood pressure ≥ 140/90 mm Hg*	≤ 35%	15.0	43%	45%
Blood pressure < 130/80 mm Hg	25%	10.0	38%	9.5%
LDL Control ≥ 130 mg/dl*	≤ 37%	10.0	19%	33%
LDL Control < 130 mg/dl	36%	10.0	43%	43%
Eye Examination	60%	10.0	48%	28%
Foot Examination	80%	5.0	76%	62%
Smoking Status	80%	10.0	71%	81%

*Measures of poor control

Total scores were calculated based on whether each variable met the threshold weight, the required number of patients to gain the total points for that particular variable. If the total sample (all participants) met the criteria, then they were given the points; if they did not meet the threshold weight, points were deducted. Results of the total samples outcome on the Diabetes Scorecard indicate that the pre and post overall scores stayed the same, 35 out of 100 possible points. There were 52% of patients with an A1C greater than 9 at the start of the study, and it remained the same percentage after the study was complete. There was a 5% increase in patients that had an A1C of less than 8, and a 4.7% increase in patients that had an A1C of 7 or less. The NCQA describes poor blood pressure as a systolic and diastolic reading of 140/90 or greater; 43% of the patients had 'poor' blood pressure at the start of this study and 45% measured poorly following completion of the study. Thirty-eight percent of the patients met the recommended blood pressure reading for people with diabetes before the study and 9.5% met the recommendations after the study (American Diabetes Association, 2010). Participants with poor cholesterol control (greater than or equal to 130) went from 19% to 33% and patients with good control (less than 100) stayed at 43%. There was a decrease in rates for eye and foot examintions; a 20% drop in eye exams and a 14% drop in foot exams. However, there was a 10% increase in addresing smoking status assessment, offering cessation advice, and treatment.

Of particular interest on the Scorecard was the hemoglobin A1C. Higher scores indicate poor control of blood sugar levels. Pre- and post-intervention means and repeated-measures t-test results are depicted in Table 9.

Table 9.
Hemoglobin A1C t-test results

	n	*M*	*t*	*p*
Pre	13	9.36		
			.337	.742
Post	13	9.52		

The Kolmogorov-Smirnov test revealed that the sample of the mean difference scores for the A1C followed a normal distribution ($p = .641$). Therefore, the t-test was completed to determine if there was a significant difference in the pre- and post-test scores. Missing values were excluded case-by-case. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores (n = 13, t (12) = .337, $p = .742$, d = .90353). The mean score for the pre-test was 9.36 and post-test was 9.52, revealing that the intervention did not impact participating patients' positive management of their hemoglobin A1C levels.

CHAPTER V

DISCUSSION

Introduction

This chapter will review the research findings of the Motivational Interviewing intervention and discuss how they are relevant. It will answer the research questions and examine the posed hypotheses. The chapter will also describe the limitations of the research methodology and present implications for investigators interested in adding to the body of research pertaining to improving self-management among persons with poorly controlled diabetes.

Summary of Findings

Because of the low numbers of participants in this study and the number of statistical tests performed, results must be viewed in a tentative fashion. It is possible that the first statistical test performed for Hypothesis I yielded a statistically significant difference because of a Type 1 error. When many statistical tests are performed for the same data, it is possible that differences appear by chance, rather than because the differences actually exist. In addition, it is possible that the second statistical test performed for Hypothesis 2 did not yield a statistically significant difference due to a type 2 error. When low numbers are included in a study, there may not be enough power in the statistical tests to detect real differences that exist. Throughout the discussion of the results in this chapter, the possibility of Type 1 and 2 errors should be taken into consideration.

Research Question One. The perception of care of the diabetes patients who participated in the study was evaluated using the Patient Assessment of the Chronic Illness Care (PACIC) instrument. There were two research questions posed pertaining to patients' perception of the care they received. The first question was: Is there a significant difference in patients' and

physicians' perceptions of care as measured by the Patient Assessment of Chronic Illness Care (PACIC)? To answer this research question, a paired samples t-test was completed for the overall pre-PACIC and the DACIC, and it revealed that there was not a significant difference of means, $n = 15$, $t\ (14) = -.949$, $p = .359$, $d = .24505$. Pre-intervention PACIC scores revealed that patients ($M = 68.0$, $SD = 22.8$) perceived a slightly higher level of care from physicians than physicians ($M = 61.8$, $SD = 6.4$) reported delivering. Non-significant scores suggest that, prior to the intervention, physicians and patients had similar perceptions regarding the care provided by the practice and its adherence to the Chronic Care Model.

A paired-samples t-test was also completed for the overall post-PACIC and the DACIC. It showed that there was a significant difference of means, $n = 10$, $t\ (9) = -5.283$, $p = .001$, $d = 1.67053$. The mean of the patient's perception of care ($M = 88.7$, $SD = 14.1$) was higher than the mean of doctor's perception ($M = 63.0$, $SD = 6.22$) of care. These results suggest that, after the intervention, patients' perceptions of the care they received were significantly higher than the care physicians reported providing. The hypothesized outcomes for this research questions were as follows:

a. (H_1) There will be a significant difference in perception between patients and their physicians of the care provided.

b. (H_2) Physicians will report delivering care that configures more to the Chronic Care Model than will persons with poorly controlled diabetes will report receiving.

From the results of the two statistical tests that were performed, Hypothesis 1 was accepted. There was a significant difference in the second test performed between the patients' perception of care following the intervention and their physicians of the care provided. Patients believed the care they had been provided was more positive than the care the physicians believed had been provided to their patients. Hypothesis 2 was rejected. Physicians reported delivering

care that configured less to the Chronic Care Model than the persons with poorly controlled diabetes reported receiving.

These findings are important in that they suggest that patients and their physicians do not have the same perceptions of the quality of care provided. Surprisingly, patients reported that that quality of care they were being provided was higher than physicians believed was being provided to patients, both prior to and after the intervention. Following the intervention, however, patients' perceptions of care were substantially higher than prior to the intervention, though physicians' perceptions of the care they provided did not change. Perhaps the counselors who served as care managers in this study communicated to patients that they were being provided high quality care. The belief that precipitated this study was that poorly performing patients would improve if counselors who acted as care managers interacted with them on a weekly basis and encouraged them to improve behaviors that would be beneficial to them and help control their diabetes. Whether patients' actual behaviors improved as a result of interacting with counselors serving as care managers is explored in later hypothesis, but it is important to note that patients believed their care was better than their physicians believed care was being provided to them.

Research Question Two. The second question was: Is there a significant difference in patients' perception of care, as measured by the PACIC, after completing the Motivational Interviewing intervention? To answer this research question, a repeated measures t-test was completed for the overall pre-PACIC and the overall post-PACIC, and it revealed that there was a significant difference between the pre- and post-test scores (t (10) = 3.349, p = .007, d = 1.00976). The mean of the post-PACIC (M = 89.3, SD = 13.5) was higher than the pre-PACIC (M = 67.73, SD = 21.6). The hypothesized outcome for this research question was:

a. (H_3) Patients will have a more positive perception of the care received from their primary care practice after completing the Motivational Interviewing intervention.

Based on the significant results of the t-test and the increase in the means from pre-test to post-test, the third hypothesis of the study was confirmed. The patients perceived that the quality of care they received from the practice increased after they completed the study. In joining efforts with the practice to combat the traditional acute care system described by Bringewatt (2003), the MI study was patterned after the CCM. The MI program serviced the multidimensional needs of the patient rather than solely addressing medical issues. The counselors who served as care managers in the program served as a liaison between the patients and diabetes management programs and other necessary agencies. As a result of their interdisciplinary training, patients were able to organize their services to offer foundational knowledge and resources for obtaining prescriptions, diet plans, and weight loss programs, as well as understanding the roles of mental health, social work, and diabetes professionals. Being aware and being able to access such resources allowed the patients to be proactive in their maintenance procedures rather than merely being reactive and ill equipped when responding to crises events.

Research Question Three. Patients' self-management of their diabetes was measured by the DSMART. The third research question addressed this variable: Is there a significant difference in patients' diabetes self-management, as measured by the DSMART, after completing the Motivational Interviewing intervention? To answer this research question, a repeated-measures t-test was completed for the overall pre-DSMART and the post-DSMART, and it revealed that that there was not a significant difference between the pre- and post-test scores ($n = 8$, $t\,(7) = .603$, $p = .566$, d=.21309). The mean of post DSMART ($M = 245.3$, $SD =$

24.3) was higher than the mean of the pre DSMART ($M = 241.4$, $SD = 17.9$). These results revealed that the intervention was moving toward increasing participating patients' positive overall self-management behaviors, but did not rise to the level of statistical significance. The hypothesized outcome for this research question was as follows:

b. (H_5) Patients' management of their diabetes will increase as a result of their participation in the MI intervention.

Due to the small sample size, there is an increased chance that there was a Type 2 error in that there may have been a real difference even though for the sample population in this study no statistically significant difference between patients' pre- and post- status of diabetes management was detected. In attempting to confirm the hypothesis, the mean scores of the overall pre and post DSMART test scales were analyzed. The repeated measures t-test results resulted in the rejection of the hypothesis that patients' management of their diabetes would significantly increase as a result of the MI program. However, the change in mean scores of the overall scale and in five of the seven subscales revealed that there were improvements in management behaviors between pre- and post-test administrations. Particularly, there was progress in patients' exercising habits, skill in problem-solving high and low blood glucose levels, monitoring of glucose levels, and ability to manage their diabetes despite life's disruptions.

Research Question Four. The DSE measured the self-efficacy of the patients in managing their chronic illness. The research question that addressed this variable was: Is there a significant difference in patients' level of diabetes self-efficacy, as measured by the Diabetes Self-Efficacy Scale, after completing the Motivational Interviewing intervention? To answer this research question, a repeated-measures t-test was completed for the overall pre-DSE and the post-DSE scores, and it revealed that there was not a significant difference between the pre- and post-test scores ($n = 12$, $t\ (11) = 1.662$, $p = .125$, $d = .48007$). However, the mean scores

increased after the intervention; the mean of the patients' pre-DSE was 81.83 and the mean of patient's post-DSE was 90.58. These results suggest that, although the change in diabetes self-efficacy was not significant, patients' participation in the intervention was moving toward having a positive impact on patients' level of diabetes self-efficacy. The hypothesized outcome for this research questions was:

a. (H_6) Patients' level of self-efficacy in managing diabetes will increase as a result of their participation in the MI intervention.

Hypothesis 6 was not accepted. Due to the small sample size, there is an increased chance that there was a Type 2 error for this hypothesis in that real difference may not have been statistically detected. In attempting to confirm the hypothesis, I analyzed the mean scores of the overall pre- and post-DSE test scales. The repeated-measures t-test results disproved the hypothesis that patients' diabetes self-efficacy will increase as a result of the MI program. However, the change in mean scores of the overall scale and in three of the five subscales revealed that there were improvements in belief in ability to maintain self-care between pre and post test administrations. Particularly, there was progress in patients' belief in their ability to adhere to their diet, to self-treat, and in their level of certainty.

Research Question Five. The components of the Diabetes Scorecard were the patients' weight, blood pressure, smoking status, hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations.

The combined sample scores for the overall Diabetes Scorecard showed no change. When analyzing each of the variables, it was found that there were declines in patients who met the recommended target blood pressure of 130/80, completed their eye and foot exams, and an increase in subjects who had poor cholesterol control. However, there were improvements for

patients with A1C's lower than 7, and for those who were assessed and treated for smoking. The percent of patients who had an A1C of 9 or greater stayed the same.

A repeated-measures t-test was completed to determine if there was a significant difference in the pre- and post hemoglobin A1C test scores. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores ($n = 13$, $t(12) = .337$, $p = .742$, $d = .90353$). The mean score for the pre-test was 9.36 and post-test was 9.52, revealing that the intervention was moving in a negative direction toward having an impact on participating patients' positive management of their hemoglobin A1C levels. The hypothesized outcomes for this research questions were as follows:

a. (H_7) Following the intervention, there will be a statistically significant improvement on the overall score on the Scorecard.

Hypothesis 7 was not accepted.

Limitations

The greatest limitation of this study was the small sample size. Not having the Cohen's suggested sample size of 64 (1992) increased the probability that real differences would not be detected statistically. Additionally, only patients from a single family practice clinic were included in the study, which limits the ability to generalize results to a larger population of diabetes care patients.

Another limitation was the number of statistical tests performed. The large number of tests performed increased the probability that statistically significant differences would be found by chance.

The six-month intervention period was also a hindrance to allowing for the body to make significant changes in the physiological variables that were evaluated. Rapport between the care managers and the patients was the crux of the foundation for building productive professional

relationships. However, a barrier to such an interaction was the amount of time available to be invested by the care managers and the patients in the program.

Implications for Counseling, Diabetes Care, and Chronic Care Management

This research project was concerned with the personal struggles of patients and their families who attempt to manage diabetes, and the devastating results of poorly managing the illness. Over the past six months, the study utilized the framework set out by the diabetes researchers. Despite the lack of statistical significance in many areas, the results of the intervention hold promise that progress was made in aiding patients to attend to and modify the influential behaviors that affect their chronic illness.

Helping patients increase their confidence to carry out tasks specific to diabetes management as a way to increase the health of diabetes patients was a concept proposed by Rapley, Passmore, and Phillips (2004). Having the knowledge gathered in this study, that using counselors as care managers may increase patients' level of self efficacy, is valuable to primary care physicians and other diabetes specialists. Results from the study should inform physicians of the areas of concerns patients have in being able to succeed in complying with recommended treatment regimens. The results of this study could also be used to educate health care professionals as to where patients need additional support and encouragement to improve chances of increasing both confidence and adherence. Once patients feel competent, they will be better self advocates and less likely to fall short in maintaining their wellness.

For the benefit of training, novice, and veteran counselors, Coldridge (2005) encouraged counselors to expand their professional identity and explore the other aspects of the healthcare system as done in this study. Coldridge purported that "further key areas central to continuing professional development include knowledge and awareness of assessment issues, time-limited

therapies, pharmacological interventions, chronic illness and its relationship to mental health, evidence-based practice and research skills" (2005, para. 1).

The professional literature suggests that a change or modification of behaviors in management of a debilitating disease is noteworthy. For instance, it has been suggested that patients' distress resulting from managing a chronic illness is attributed to the constant threat of death, reduced life expectancy, decreasing physical strength, and an intrusive medical regime that robs patients of their autonomy (Gilbar, Or-Han, & Plivazky, 2005). These scholars suggested that patients battling such struggles are also often plagued with depression. The effects of chronic illness are not solely felt by the patient; reports from the Centers for Disease Control and prevention reveal that the residuals are national (2008). The leading causes of death and disability in the United States are chronic illnesses such as heart disease, cancer, and diabetes, and account for 70% of all deaths, or nearly 1.7 million each year (Centers for Disease Control, 2008). Of the trillion dollars spent on healthcare annually, 70% goes to financing the cost of chronic illnesses (Centers for Disease Control, 2004). The total direct and indirect cost of treating and preventing diabetes in the U.S. was $174 billion in 2007 (Centers for Disease Control, 2007). To combat such adverse effects and increase successful management of diabetes, the Self-Care Behaviors Framework was developed by the American Association of Diabetes Educators and implemented by medical professionals with their Patient Centered Medical Home initiative. This framework calls for changes in eating, being active, monitoring, taking medication, problem solving, reducing risks, and health coping (AADE, 2009). This framework is applicable considering the statistics and risks that people with diabetes face. For instance, the Centers for Disease Control and Prevention (2007) reported that the most common complications

of diabetes are heart disease and stroke, hypertension, blindness, kidney disease, nervous system disease, amputations, dental disease, and difficulties in pregnancy.

Previous studies aided in the development of implications for this study in regards to the chronic care management aspect that was investigated. There was an experimental study performed with a similar research design, utilizing master's level counselors to implement a MI and CCM-based intervention for patients suffering with obesity (Ely et al., 2008). Their outcomes supported the efforts and results found for this investigation; participants in the intervention group were benefited by the program. The experimental group lost more weight, increased self-advocacy behaviors, and was motivated to change weight control behaviors. Another study that supports this researcher's outcomes, found that their CCM grounded intervention prepared the clients to be resourceful and better self-managers on their road to recovering from alcohol addiction (Cacciola et al., 2008). It is suggested that future investigators follow-up on the progress of their participants to assess the retention of positive behaviors learned from the intervention as did Cacciola et al. The trend of this study's results, although not statistically significant, followed the pattern found in the study conducted by Szecsenyi et al. (2008) in which patients participated in a Chronic Care Model-based program, after which they reported having received better care on the subscales such as goal setting, problem-solving, and contextual counseling.

Implications for Future Research

The process undertaken for the Motivational Interviewing program carried both advantages and disadvantages. In analyzing each phase of the project, I found areas that would be worth replicating and areas where modifications would be warranted for future researchers. To assist in the analysis and for debriefing purposes, the care managers were asked to share their

input on the process and outcome of the study. All five care managers were contacted; however, only three of the five responded. They were asked the following questions: (1) The strengths of the study? [What worked?]; (2) What could have been done differently? [What did not work?]; (3) For the patients with whom you were most successful, what were the top 3 reasons why?; and (4) For the patients with whom you were least successful, what were the top 3 reasons why? The responses of the care managers were helpful in analyzing the effectiveness of the approach used to complete this study.

Phase One. In regards to the recruitment strategy of the counselors to serve as care managers, a recruitment letter (Appendix D) was distributed via email to masters- and doctoral level students. The letter was informative and outlined the purpose, participation requirements, and benefits of the study. Emailing all students in the department was a way to reach a large number of prospective participants with minimal time and monetary cost. It was also effective to visit the supervision groups of students entering their first and second semester of internship and promote the program as a supplement to their primary site. With the visits and the mass email, only half of the anticipated number of care managers consented to participate. For future investigators to obtain the desired number of care managers, the recruiter could make visits to master's and doctoral level classes along with contacting the individual supervisors of internship students. The researcher may also consider expanding their recruitment efforts to neighboring universities with CACREP accredited graduate counseling programs. In addition, it might be possible for master's and doctoral students to be assigned to serve as care managers as a part of their practicum or internship responsibilities.

The two-day training workshop was effective in that it provided an understanding of the program and the efforts necessary for treatment of diabetes from a multi-disciplinary and

multidimensional perspective. To enhance the effectiveness of the mock sessions where one would role play as the patient with diabetes and the other the care manager, interested investigators may consider taping the sessions and having the workshop attendees critique the performances.

In regards to recruiting patients, the initial study protocol outlined an experimental design, projecting that 50 patients would be recruited; 25 would be placed in treatment group and 25 in the control group. Despite the efforts put into recruiting the 133 patients on the list, only 33 patients agreed to attend the information session, 21 consented to participate, and 12 completed the study. In analyzing the process, it was found that patients were not consenting for reasons such as not wanting to commit for a six month period; not wanting to be called, to visit, or be visited on a weekly basis; feeling as though they had already tried and were unsuccessful with similar programs; or were simply not interested in making changes at that time. To reach the initial goal of having enough patients to randomly assign to two groups, it is recommended that future investigators consider lowering the hemoglobin A1C criteria from 9 to 8 to increase the number of patients considered for participation in the study. Also, it is suggested that future researchers solicit funding so the program can offer patients a financial stipend to encourage them to participate and remain for the entirety of the study.

Phase Two. This phase consisted of the intake procedures where patients completed their informed consents and the three pretest surveys. Scorecards were also compiled showcasing their current status on the following medical outcomes: Weight, blood pressure, smoking, hemoglobin A1C, cholesterol, micro albumin testing, annual eye and foot exams, and vaccinations. The revised Patient Assessment of Chronic Illness Care was handed out to the physicians within the practice by the medical doctor on the research team. An alternate administration technique could

be to use or create digital versions of all surveys to make for an ease of scoring and storage. Patients and physicians would then have the option of completing the surveys at a desktop computer or on a laptop. This would alleviate having to collect and track documents.

Phase Three. The implementation of the Motivational Interviewing program was necessary and practically effective, yet it was not void of challenges. In analyzing this phase of the program, there are alternatives, modifications, and dynamics that could be considered for future studies. Regarding patient retention, it may be beneficial for investigators to omit having meetings via the telephone. In the feedback received from the care mangers, it was reported that "the relationship was key in my work with my most successful patients. For the patient I met with the most, we met face-to-face each time and that seemed to greatly aid our relationship." The issue of culture was one dynamic that was addressed by a counselor, "I think all of the patients were African American. It seems that the White counselors had the highest patient drop-out rates. There may have been some distrust or discomfort on the part of the patient, or the White counselors may have unknowingly communicated discomfort or judgment that hurt the relationship." Despite the negative possibilities, that counselor not only recognized that confounding variable, but was able to broach the topic with her client, and maintain rapport and success throughout the study. Of the care managers who responded, all came to the same conclusion: Building rapport with the clients was the active ingredient in motivating and maintaining success in willing patients. This ingredient was found missing for some of the care managers. As a result they suggested that only master's level interns be recruited for future studies for such students had "the incentive of receiving direct hours for their internship." After analyzing this feedback, it is recommended that the counseling relationship (rapport between the counselor and the patient) be added and examined as a variable. It may be valuable to see the

extent to which the rapport built or not built between the counselor and participants affected management practices. It is also suggested that the study be conducted over a longer period of time to allow for changes the physiological components, such as the hemoglobin A1C.

Phase Four. The major difficulty during this final phase was getting the patients to come to the practice for the A1C posttest. Many of the patients had come in January and February, and took the A1C; however, that time period was too early to have it added to the post-data, as the protocol outlined a six month intervention. Some patients had problems with transportation, others had personal emergencies, or there was a loss of motivation. The care managers too had barriers during this process; many were balancing work, school, personal and professional commitment along with the obligations of this study.

To alleviate such a dilemma in future studies, the primary investigator could take control of the data collection process, rather than tasking the care managers with the duty. That strategy, in combination with the aforementioned electronic survey administration, may make for more efficient and successful data collection.

Along with ways to improve the design and implementation methods for future investigators interested in replicating this study, this process highlighted other research areas ripe for investigation. As previously mentioned, it is suggested that patients who completed the study be reassessed to measure whether or not they maintained the management behaviors improved by the intervention. It may also be beneficial re-evaluate the physicians after the intervention to find out if their perception of care provided changed to adhere more or less to the CCM. A qualitative aspect may be added to assess whether their interactions with the participating patients have changed, and if so, how. Lastly, it suggested that the care mangers be given direct

access to the patients' medical records, or at least given a direct line of communication to the physicians of the participants.

Conclusions

Patients with chronic illnesses are forced to manage their diabetes in conjunction with life's daily routines and uncertainties. With both anticipated and unexpected obligations, patients with diabetes are often ill-equipped to effectively balance all necessary components of life, be they mental, physical, emotional, social, intellectual, or spiritual.

The use of counselors serving as care managers added a care team member with skills that are unique and distinctive from the skills of other health professionals. As described by Alterkruse, Harris, and Brandt (2001), the counselor's role in a professional relationship with individuals, groups of individuals, or members of a family is to walk along beside them as they attempt to gain an understanding of self and others that will make way for effectively solving problems and resolving conflicts in their daily lives. The preparation programs of professional counselors emphasize the importance of broaching, managing, and sublimating cultural differences. The skills of professional counselors are supplemented with the theory and practice of rolling with resistance and examining and resolving ambivalence, which is emphasized in the Motivational Interviewing Model. Such a quality is necessary when facilitating change in an individual perplexed with managing a dynamic and temperamental chronic illness.

Other studies have examined nursing, certified diabetes educators, pharmacists, and other medical staff as care managers for patients with diabetes (Herrin, Cangialose, Nicewander, Ballard, 2007; Krien, et. al., 2004; Loveman, Royle, & Waugh, 2003; Middleton, 2003;). Some of these studies have shown improvement in the care of the chronic disease. Perceived problems include expense of higher-level nurses such as diabetes educators, and a shortage in supply of

this and other nursing professionals (Davidson, 2007). Additionally, the cost for a typical primary care practice of hiring a registered nurse or certified diabetes educator to help manage the care of poorly controlled diabetes patients may be prohibitive (Mercer, 2009). Student counselors are a more affordable and accessible professional with the skills necessary to elicit and empower behavioral change in patients suffering with depression, lack of adaptive coping mechanisms, and depleted motivation commonly found among patients suffering with chronic illness, specifically diabetes. There were not many statistically significant changes reported in this study. However, the practical implications of the results of this study are striking and noteworthy. The sample of patients that participated in the study appeared to be influenced by the educational and supportive approach of the intervention. It appears that diabetes patients received a motivational seed from their counselor care managers that might lead to growth towards awareness and management of their diabetes.

Chapter 6

MASUSCRIPT FOR SUBMISSION

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CHRONIC ILLNESS

Chronic illnesses are characterized as having long duration, frequent recurrence over a long time, and often by slowly progressing seriousness (Medline Plus Medical Dictionary, 2010).The United States Department of Chronic Disease and Health Promotion (2009) has explained that such illnesses are not contagious but persist throughout the lifespan, do not resolve spontaneously, and are rarely cured completely. Chronic illnesses —such as heart disease, cancer, and diabetes—are the leading causes of death and disability in the United State and account for 70% of all deaths, which is 1.7 million each year (Centers for Disease Control, 2008). Of the trillion dollars spent on healthcare annually, 70% goes to financing the cost of chronic illnesses (Centers for Disease Control, 2004).

Although chronic diseases are among the most common and costly health problems, they are also among the most preventable (Centers for Disease Control, 2004). Adopting healthy behaviors such as eating nutritious foods, being physically active, and avoiding tobacco use can prevent or control many of the devastating effects of these diseases.

Type 2 Diabetes

Type 2 diabetes usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce it. Type 2 diabetes is associated with older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity, and race/ethnicity. At particularly high risk for Type 2 diabetes and its complications are African

Americans, Hispanic/Latino Americans, American Indians, some Asian Americans, and Native Hawaiians or Other Pacific Islanders. Type 2 diabetes in children and adolescents is rare, but accounts for 90-95% of the incidence of diabetes in adults.

Statistics

In 2007, the Centers for Disease Control reported national estimates on the effects diabetes has had on the United States. For the one analyzed year alone, there were 23.6 million people (7.8% of the population) who had diabetes. Of that amount, approximately 186,300 people were younger than 20 years, which is equivalent to 0.2% of all people in this age group. A total of 10.7% of all people above 20 years of age have diabetes. In focusing on the elderly population who were 60 year of age or older, it was found that 12.2 million, or 23.1% of all people in this age group had diabetes. A total of 11.2% of all men aged 20 years or older had diabetes and 10.2% of all women aged 20 years or older had diabetes. The total direct and indirect cost of treating and preventing diabetes to the U.S. was $174 billion in 2007.

Lifestyle

The American Association of Diabetes Educators (AADE, 2009) has suggested that in order to manage diabetes, individuals will be successful if they follow the Self-Care Behaviors Framework. This framework suggests lifestyle changes in several areas: eating, being active, monitoring, taking medication, problem solving, reducing risks, and healthy coping. Supporters of both the Chronic Care Model and the Patient Centered Family Home initiative adhere to the recommendations of AADE in their treatment of patients with diabetes.

Importance of this Study

Although there is recognition of the life-long battle faced by patients and families who deal with chronic illnesses, the interventions of health professionals do not meet the continual

and multidimensional needs of patients and families who deal with chronic illnesses. Researchers attribute the gap between the current care delivered to patients with chronic disease and the ideal care, including continuity and support of patient self-management, to an insufficient health care system. Studies have explained that rather than reacting to the elements of a chronic illness, the traditional health care system typically responds to acute illnesses, which are characterized as having a sudden onset, sharp rise, and short course (Hurd, 2007). Recent models of care such as the Chronic Care Model and the Patient Centered Medical Home, provide for care management and patient self-care in chronic diseases such as diabetes. The Chronic Care Model endorses a paradigm shift in which the care system includes provider-oriented components such as continuing education or physician feedback, organizational changes in personnel or management of visits and follow-ups, information systems changes, and patient oriented interventions of an educational or supportive nature (Wagner, Austin, Davis, Hanmarsh, Scaefer, & Bonomi, 2001). The Patient Centered Medical Home encourages comprehensive primary care for patients, and partnerships between individual patients and their personal physicians, and when appropriate, the patient's family (Patient-Centered Primary Care Collaborative, 2007).

How care management and patient self-care can be integrated into a primary care practice remains a challenge as the health care system adopts these new models of care. The present study examines the use of health counselors in a primary care practice interacting with persons with poorly controlled Type 2 diabetes. The study seeks to determine whether counselors serving as health care managers can improve the functioning of diabetes patients.

RESEARCH DESIGN AND METHODS

The study utilized a quasi-experimental approach in that subjects were not randomly assigned into an experimental and a control group. Rather, the pre- and post-treatment effects of

the Motivational Interviewing intervention were measured among patients that participated in the diabetes self-management program. Baseline and results data were gathered through the use of four surveys administered before and after the intervention.

Study Setting

The study was based in an academic family practice located in the Hampton Roads area of Virginia between the months of September 2009 through March 2010. Initial meetings were made at the family practice and in the patients' homes. Subsequent sessions took place in the home of the clients, at the family practice, and were conducted in person or on the telephone.

Participants

Diabetes patients with an A1C of 9 or higher were recruited to participate in the study. The sample was purposefully selected from a physician generated database output. Twenty-one patients consented to participate in the study. Patients with high A1C levels were sought due to the fact that the American Diabetes Association encourages people with diabetes to aim for an A1C or 6.5 or lower. It has been found that chronically high blood glucose levels is linked with heart, kidney, and eye damage, as well as, stroke and lower brain function (Blood Sugar Management: Testing, 2010; DCCT and EDIC: The Diabetes Control and Complications Trial and Follow-up Study, 2008). It has also been found that for every point the A1C level is lowered, the lower the risk of developing a variety of complications: eye disease risk is reduced by 76%; kidney disease risk is reduced by 50%; nerve disease risk is reduced by 60%; any cardiovascular disease event risk is reduced by 42%; nonfatal heart attack, stroke, or risk of death from cardiovascular causes is reduced by 57% (DCCT and EDIC: The Diabetes Control and Complications Trial and Follow-up Study, 2008).

Twenty-five physicians working with persons with poorly controlled diabetes and the general family practice population were solicited for the study. Physicians included were both medical residents and faculty. Those selected were from a pool of physicians recruited from Eastern Virginian Medical School (EVMS). This medical school partners with local clinics, hospitals, and physicians in the neighboring region.

Instrumentation

There were three quantitative instruments administered to the patients: Diabetes Self-Efficacy Scale (DSE), Diabetes Self-Management Assessment Tool (D-SMART), and the Patient Assessment of Chronic Illness Care (PACIC). The Patient Assessment of Chronic Illness Care was adapted and given to the participating physicians to assess their perception of care given by their health care team. The fourth assessment tool was the Diabetes Scorecard. The scorecard was created for patients based on information generated from their electronic health record. The data collected for the scorecard were the patients' weight, blood pressure, smoking status, hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations. These assessments were administered to clients prior to the start of the intervention and again following the treatment, and were scored by the counselors.

Method

The treatment intervention was provided by master's and doctoral level counselors. During the first session, counselors facilitated a structured interview (Appendix B) to discuss outcomes and implications of the results of the assessments. During that session, the counselors and patients collaborated to develop a care plan (Appendix C) for the remainder of the intervention. Follow-up sessions were held weekly during which the counselors and patients discussed topics such as: Feelings surrounding management of diabetes, scheduling routine lab

work (i.e. glucose and cholesterol checks), making lifestyle changes (i.e. exercise, diet, stress management) and, scheduling screenings (i.e. eye and foot exams) and vaccinations (i.e. flu, pneumonia). To conclude the program, counselors re-administered the three assessments to evaluate whether the patients' scores had been affected by the intervention. A new Diabetes Scorecard was also developed to measure whether the patients improved in their weight management, blood pressure, smoking status (if applicable), hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations. Throughout the entire program, counselors engaged the patients during sessions based on the Motivational Interviewing Model.

Notice of approval for this study was received July 21, 2009 from the Eastern Virginia Medical School Subjects Review Board allowing for the commencement of data collection period.

Data Analysis

A repeated-measures t-test was used to evaluate whether there was a significant difference of means between the pre- and post-intervention assessments.

As a result of the small sample size and to ensure the appropriateness of the selected statistical analysis, Kolmogorov-Smirnov tests were calculated on the calculated mean difference scores. That test revealed whether the differences in patients' pre- and post-intervention mean scores were normally distributed in the population. These steps were necessary because the condition of normality of the sample distribution must be satisfied in order to achieve valid repeated measures t-test results (Green & Salkind, 2008). All analyses were conducted using version 18 of the Software Package for Statistical Analysis (SPSS).

RESULTS

There were 12 patients who completed the entire program. Those participants' data were included in the data analysis detailed below. Of the 21 who started, 17 were female, 4 were male, and they ranged in age from 28-79. There were 12 African Americans, and nine Caucasians. Regarding education, 15 completed high school, and 12 reported having completed some college. Of 12 who completed the program, two were males and 10 were females. Four were Caucasian, eight were African American, they ranged in age from 36-79, and all had completed high school. The demographics of the sample in this study are parallel to the demographics of patients with diabetes presented previously, which were based on the data released by the Centers for Disease Control and Prevention (2007). There is a greater prevalence of diabetes among the elderly and among minorities. In essence, the following presentation of results could be generalized to the larger population of persons with diabetes.

Physician and Patient Perception of Care. The perception of care of the diabetes patients who participated in the study was evaluated using the Patient Assessment of the Chronic Illness Care (PACIC) instrument. There were two research questions posed pertaining to patients' perception of the care they received. The first question was: Is there a significant difference in patients' and physicians' perceptions of care as measured by the Patient Assessment of Chronic Illness Care (PACIC)? To answer this research question, a paired samples t-test was completed for the overall pre-PACIC and the DACIC, and it revealed that there was not a significant difference of means, $n = 15$, $t\ (14) = -.949$, $p = .359$, $d = .24505$. Pre-intervention PACIC scores revealed that patients ($M = 68.0$, $SD = 22.8$) perceived a slightly higher level of care from physicians than physicians ($M = 61.8$, $SD = 6.4$) reported delivering. Non-significant scores suggest that, prior to the intervention, physicians and patients had similar

perceptions regarding the care provided by the practice and its adherence to the Chronic Care Model.

A paired-samples t-test was also completed for the overall post-PACIC and the DACIC. It showed that there was a significant difference of means, $n = 10$, $t\ (9) = -5.283$, $p = .001$, d = 1.67053. The mean of the patients' perceptions of care following the intervention ($M = 88.7$, $SD = 14.1$) was higher than doctors' perceptions of care ($M = 63.0$, $SD = 6.22$). These results suggest that, after the intervention, patients' perceptions of the care they received were significantly higher than the care physicians reported providing. Patients believed the care they had been provided was more positive than the care the physicians believed had been provided to their patients. Physicians reported delivering care that configured less to the Chronic Care Model than the persons with poorly controlled diabetes reported receiving.

These findings are important in that they suggest that patients and their physicians do not have the same perceptions of the quality of care provided. Surprisingly, patients reported that that quality of care they were being provided was higher than physicians believed was being provided to patients, both prior to and after the intervention. Following the intervention, however, patients' perceptions of care was substantially higher than prior to the intervention, though physicians' perceptions of the care they provided did not change. Perhaps the counselors who served as care managers in this study communicated to patients that they were being provided high quality care. The belief that precipitated this study was that poorly performing patients would improve if counselors who acted as care managers interacted with them on a weekly basis and encouraged them to improve behaviors that would be beneficial to them and help control their diabetes. Whether patients' actual behaviors improved as a result of interacting with counselors serving as care managers is explored in later hypothesis, but it is

important to note that patients believed their care was better than their physicians believed care was being provided to them. Pre- and post-intervention means and t-test results for the overall test and for all scales are depicted in Tables 3 and 4.

Table 3.
Doctor and Patient Assessment of Chronic Illness Care—Pre-Intervention

	n	*M*	*SD*	*t*	*p*
DACIC	15	61.80	6.39		
				-.949	.359
Pre-PACIC	15	68.00	22.79		

Table 4.
Doctor and Patient Assessment of Chronic Illness Care—Post-Intervention

	n	*M*	*SD*	*t*	*p*
DACIC	10	63.00	6.22		
				-5.283	.001
Post-PACIC	10	88.70	14.10		

Patient Perception of Care. The second question was: Is there a significant difference in patients' perception of care, as measured by the PACIC, after completing the Motivational Interviewing intervention? To answer this research question, a repeated measures t-test was completed for the overall pre-PACIC and the overall post-PACIC, and it revealed that there was a significant difference between the pre- and post-test scores (t (10) = 3.349, p = .007, d = 1.00976). The post-PACIC mean scores (M = 89.3, SD = 13.5) were higher than the pre-PACIC mean scores (M = 67.73, SD = 21.6). Based on the significant results of the t-test and the increase in the means from pre-test to post-test, the third hypothesis of the study was confirmed. Pre- and post-intervention means and t-test results for the overall test and for all scales are depicted in Table 5.

Table 5.

Patient Assessment of Chronic Illness Care

Scales	*N*	Pre-test *M*	Post-test *M*	*t*	*p*
Overall	11	67.73	89.23	3.35	.007
Activation	12	11.25	13.25	1.82	.097
Delivery	12	10.33	14.00	3.604	.004
Goals	12	14.67	23.00	4.71	.001
Problem-Solving	11	13.55	18.18	3.54	.005
Follow-up	21	17.00	17.00	N/A	N/A

The patients' perceived that the quality of care they received from the practice increased after they completed the study. The MI study was patterned after the CCM. Counselors serving as care managers joined efforts with the medical practice to combat the traditional acute care system described by Bringewatt (2003). The MI program serviced the multidimensional needs of the patient rather than solely addressing medical issues. The counselors who served as care managers in the program served as a liaison between the patients and diabetes management programs and other necessary agencies. As a result of their interdisciplinary training, patients were able to organize their services to offer foundational knowledge and resources for obtaining prescriptions, diet plans, and weight loss programs, as well as understanding the roles of mental health, social work, and diabetes professionals. Being aware and being able to access such resources allowed the patients to be proactive in their maintenance procedures rather than merely being reactive and ill equipped when responding to crises events. These aspects of the MI program may have led patients to perceive a better quality of care from their team following the intervention.

Self-Management. Patients' self-management of their diabetes was measured by the DSMART. The third research question addressed this variable: Is there a significant difference in patients' diabetes self-management, as measured by the DSMART, after completing the Motivational Interviewing intervention? To answer this research question, a repeated-measures t-test was completed for the overall pre-DSMART and the post-DSMART, and it revealed that that there was not a significant difference between the pre- and post-test scores ($n = 8$, $t\ (7) = .603$, $p = .566$, d=.21309). The post-intervention mean scores on the DSMART ($M = 245.3$, $SD = 24.3$) were higher than the pre-intervention mean scores on the DSMART ($M = 241.4$, $SD = 17.9$). These results revealed that the intervention was moving toward increasing participating

patients' positive overall self-management behaviors, but did not rise to the level of statistical significance

Due to the small sample size, there is an increased chance that there was a Type 2 error in that there may have been a real difference even though for the sample population in this study no statistically significant difference between patients' pre- and post- status of diabetes management was detected. In attempting to confirm the hypothesis, the mean scores of the overall pre and post DSMART test scales were analyzed. The repeated measures t-test results resulted in the rejection of the hypothesis that patients' management of their diabetes would significantly increase as a result of the MI program. However, the change in mean scores of the overall scale and in five of the seven subscales revealed that there were improvements in management behaviors between pre- and post-test administrations. Particularly, there was progress in patients' exercising habits, skill in problem-solving high and low blood glucose levels, monitoring of glucose levels, and ability to manage their diabetes despite life's disruptions. Pre- and post-intervention means and t-test results for the overall test and for all scales are depicted in Table 6.

Table 6.
Diabetes Self-Management Assessment Report Tool

Scales	*n*	Pre-test *M*	Post-test *M*	*t*	*p*
Overall	8	241.37	245.25	.603	.566
Eating	10	20.60	20.10	-.711	.495
Exercising	9	21.11	23.56	1.63	.142
Medication	10	20.30	19.20	-.390	.706
Problem-Solve-High	10	25.20	26.90	1.61	.141
Problem-Solve-Low	10	26.90	28.20	.614	.555
Monitoring	10	20.50	22.80	.955	.365
Living	9	107.67	95.44	-1.521	.167

Self-Efficacy. The Diabetes Self-Efficacy Scale (DSE) measured the self-efficacy of the patients in managing their chronic illness. The research question that addressed this variable was: Is there a significant difference in patients' level of diabetes self-efficacy, as measured by the DSE, after completing the Motivational Interviewing intervention? To answer this research question, a repeated-measures t-test was completed for the overall pre-DSE and the post-DSE scores, and it revealed that there was not a significant difference between the pre- and post-test scores ($n = 12$, $t\ (11) = 1.662$, $p = .125$, $d = .48007$). However, the mean scores increased after the intervention; the mean of the patients' pre-DSE was 81.83 and the mean of patient's post-DSE was 90.58. These results suggest that, although the change in diabetes self-efficacy was not significant, patients' participation in the intervention was moving toward having a positive impact on patients' positive level of diabetes self-efficacy.

Due to the small sample size, there is an increased chance that there was a Type 2 error for this hypothesis in that real difference may not have been statistically detected. In attempting to confirm the hypothesis, the researcher analyzed the mean scores of the overall pre- and post-DSE test scales. The repeated-measures t-test results disproved the hypothesis that patients' diabetes self-efficacy will increase as a result of the MI program. However, the change in mean scores of the overall scale and in three of the five subscales revealed that there were improvements in patients' beliefs in their ability to maintain self-care between pre- and post-test administrations. Particularly, there was progress in patients' belief in their ability to adhere to their diet, to self-treat, and in their level of certainty. Pre- and post-intervention means and t-test results for the overall test and for all scales are depicted in Table 7.

Table 7.

Diabetes Self-Efficacy

Scales	*n*	Pre-test *M*	Post-test *M*	*t*	*p*
Overall	12	81.83	90.58	1.663	.125
Diet	12	12.91	13.58	.665	.520
Exercise	12	8.17	7.42	-.799	.441
Self-Treat	12	24.00	28.92	2.152	.054
Routine	12	4.83	3.08	-1.969	.075
Certainty	12	17.75	18.92	.532	.606

Physiological Variables. Physiological variables consisted of the patients' weight, blood pressure, smoking status, hemoglobin A1C, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations. These data were measured using the Diabetes Scorecard, with higher scores indicating positive management behaviors. Results for the physiological variables assessed for the Diabetes Scorecard are depicted in Table 8.

Table 8.
Diabetes Scorecard Results

Score Measures	Threshold (% of patients in sample)	Weight	Pre	Post
HbA1c Control > 9.0 %*	≤ 15%	12.0	52%	52%
HbA1c Control < 8.0 %	60%	8.0	24%	29%
HbA1c Control < 7.0 %	40%	5.0	4.8%	9.5%
Blood pressure ≥ 140/90 mm Hg*	≤ 35%	15.0	43%	45%
Blood pressure < 130/80 mm Hg	25%	10.0	38%	9.5%
LDL Control ≥ 130 mg/dl*	≤ 37%	10.0	19%	33%
LDL Control < 130 mg/dl	36%	10.0	43%	43%
Eye Examination	60%	10.0	48%	28%
Foot Examination	80%	5.0	76%	62%
Smoking Status	80%	10.0	71%	81%

* a measure poor control

Total scores were calculated based on whether each variable met the threshold weight, the required number of patients to gain the total points for that particular variable. If the total sample (all participants) met the criteria, then they were given the points; if they did not meet the threshold weight, points were deducted. Results of the total samples outcome on the Diabetes Scorecard indicate that the pre and post overall scores stayed the same, 35 out of 100 possible points. There were 52% of patients with an A1C greater than 9 at the start of the study, and it remained the same percentage after the study was complete. There was a 5% increase in patients that had an A1C of less than 8, and a 4.7% increase in patients that had an A1C of 7 or less. The NCQA describes poor blood pressure as a systolic and diastolic reading of 140/90 or greater; 43% of the patients had 'poor' blood pressure at the start of this study and 45% measured poorly following completion of the study. Thirty-eight percent of the patients met the recommended blood pressure reading for people with diabetes before the study and 9.5% met the recommendations after the study (American Diabetes Association, 2010). Participants with poor cholesterol control (greater than or equal to 130) went from 19% to 33% and patients with good control (less than 100) stayed at 43%. There was a decrease in rates for eye and foot examintions; a 20% drop in eye exams and a 14% drop in foot exams. However, there was a 10% increase in addresing smoking status assessment, offering cessation advice, and treatment.

Of particular interest on the Scorecard was the hemoglobin A1C. Higher scores indicate poor control of blood sugar levels. Pre- and post-intervention means and repeated-measures t-test results are depicted in Table 9.

Table 9.
Hemoglobin A1C t-test results

	n	*M*	*t*	*p*
Pre	13	9.36		
			.337	.742
Post	13	9.52		

The Kolmogorov-Smirnov test revealed that the sample of the mean difference scores for the A1C followed a normal distribution (p = .641). Therefore, the t-test was completed to determine if there was a significant difference in the pre- and post-test scores. Missing values were excluded case-by-case. The repeated-measures t-test revealed that there was not a significant difference between the pre- and post-test scores (n = 13, t (12) = .337, p = .742, d = .90353). The mean score for the pre-test was 9.36 and post-test was 9.52, revealing that the intervention did not impact participating patients' positive management of their hemoglobin A1C levels.

IMPLICATIONS FOR COUNSELING, DIABETES CARE, AND CHRONIC CARE MANAGEMENT

This research project was concerned with the personal struggles of patients and their families who attempt to manage diabetes, and the devastating results of poorly managing the illness. Over the past six months, the study utilized the framework set out by the diabetes researchers. Despite the lack of statistical significance in many areas, the results of the intervention hold promise that progress was made in aiding patients to attend to and modify the influential behaviors that affect their chronic illness.

Helping patients increase their confidence to carry out tasks specific to diabetes management as a way to increase the health of diabetes patients was a concept proposed by Rapley, Passmore, and Phillips (2004). Having the knowledge gathered in this study that using counselors as care managers may increase patients' level of self efficacy is valuable to primary care physicians and other diabetes specialists. Results from the study should inform physicians of the areas of concerns patients have in being able to succeed in complying to recommended treatment regimens. The results of this study could also be used to educate health care professionals as to where patients need additional support and encouragement to improve

chances of increasing both confidence and adherence. Once patients feel competent, they will be better self advocates and less likely to fall short in maintaining their wellness.

For the benefit of training novice and veteran counselors, Coldridge (2005) encouraged counselors to expand their professional identity and explore the other aspects of the healthcare system as done in this study. Coldridge purported that "further key areas central to continuing professional development include knowledge and awareness of assessment issues, time-limited therapies, pharmacological interventions, chronic illness and its relationship to mental health, evidence-based practice and research skills" (2005, para. 1).

The professional literature suggests that a change or modification of behaviors in management of a debilitating disease is noteworthy. For instance, it has been suggested that patients' distress resulting from managing a chronic illness is attributed to the constant threat of death, reduced life expectancy, decreasing physical strength, and an intrusive medical regime that robs patients of their autonomy (Gilbar, Or-Han, & Plivazky, 2005). These scholars suggested that patients battling such struggles are also often plagued with depression. The effects of chronic illness are not solely felt by the patient; reports from the Centers for Disease Control and prevention reveal that the residuals are national (2008). The leading causes of death and disability in the United States are chronic illnesses such as heart disease, cancer, and diabetes, and account for 70% of all deaths, or nearly 1.7 million each year (Centers for Disease Control, 2008). Of the trillion dollars spent on healthcare annually, 70% goes to financing the cost of chronic illnesses (Centers for Disease Control, 2004). The total direct and indirect cost of treating and preventing diabetes in the U.S. was $174 billion in 2007 (Centers for Disease Control, 2007). To combat such adverse effects and increase successful management of diabetes, the Self-Care Behaviors Framework was developed by the American Association of Diabetes

Educators and implemented by medical professionals with their Patient Centered Medical Home initiative. This framework calls for changes in eating, being active, monitoring, taking medication, problem solving, reducing risks, and health coping (AADE, 2009). This framework is applicable considering the statistics and risks that people with diabetes face. For instance, the Centers for Disease Control and Prevention (2007) reported that the most common complications of diabetes are heart disease and stroke, hypertension, blindness, kidney disease, nervous system disease, amputations, dental disease, and difficulties in pregnancy.

Previous studies aided in the development of implications for this study in regards to the chronic care management aspect that was investigated. There was an experimental study performed with a similar research design, utilizing master's level counselors to implement a MI and CCM-based intervention for patients suffering with obesity (Ely et al., 2008). Their outcomes supported the efforts and results found for this investigation; participants in the intervention group were benefited by the program. The experimental group lost more weight, increased self-advocacy behaviors, and was motivated to change weight control behaviors. Another study that supports this researcher's outcomes, found that their CCM grounded intervention prepared the clients to be resourceful and better self-managers on their road to recovering from alcohol addiction (Cacciola et al., 2008). It is suggested that future investigators follow-up on the progress of their participants to assess the retention of positive behaviors learned from the intervention as did Cacciola et al. (2008). The trend of this study's results, although not statistically significant, followed the pattern found in the study conducted by Szecsenyi et al. (2008) in which patients participated in a Chronic Care Model-based program, after which they reported having received better care on the subscales such as goal setting, problem-solving, and contextual counseling.

CONCLUSIONS

Patients with chronic illnesses are forced to manage their diabetes in conjunction with life's daily routines and uncertainties. With both anticipated and unexpected obligations and circumstances, patients with diabetes are often ill-equipped to effectively balance all necessary components of life, be they mental, physical, emotional, social, intellectual, or spiritual.

The use of counselors serving as care managers added a care team member with skills that are unique and distinctive from the skills of other health professionals. As described by Alterkruse, Harris, and Brandt (2001), the counselor's role in a professional relationship with individuals, groups of individuals, or members of a family is to walk along side them as they attempt to gain an understanding of self and others that will make way for effectively solving problems and resolving conflicts in their daily lives. The preparation programs of professional counselors emphasize the importance of broaching, managing, and sublimating cultural differences. The skills of professional counselors are supplemented with the theory and practice of rolling with resistance and examining and resolving ambivalence, which is emphasized in the Motivational Interviewing Model. Such a quality is necessary when facilitating change in an individual perplexed with managing a dynamic and temperamental chronic illness.

Other studies have examined nursing, certified diabetes educators, pharmacists, and other medical staff as care managers for patients with diabetes (Herrin, Cangialose, Nicewander, & Ballard, 2007; Krien et. al., 2004; Loveman, Royle, & Waugh, 2003; Middleton, 2003). Some of these studies have shown improvement in the care of the chronic disease. Perceived problems include, expense of higher-level nurses such as diabetes educators, and a shortage in supply of this and other nursing professionals (Davidson, 2007). Additionally, the cost for a typical primary care practice of hiring a registered nurse or certified diabetes educator to help manage

the care of poorly controlled diabetes patients may be prohibitive (Mercer, 2009). Student counselors are a more affordable and accessible professional with the skills necessary in eliciting and empowering behavioral change in patients suffering with depression, lack of adaptive coping mechanisms, and depleted motivation commonly found among patients suffering with chronic illness, specifically diabetes.

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Appendices

Appendix A
Intervention Plan

1. Research coordinator will identify patients of Portsmouth Family Medicine by querying the site's electronic health record database. Patients of interest are those with a diagnosis of diabetes and a hemoglobin A1C greater than or equal to nine.
2. Research coordinator will contact these patients to ascertain interest in participating in a study.
3. Counselors/care managers will obtain consent from the patients and randomly assign them to control and intervention groups. Counselors will also obtain consent from interested physicians who have patients with hemoglobin A1C's equal to or great than nine
4. Medical staff of the primary care practice will calculate the Diabetes Scorecard value (based upon NCQA weighting of measures) for patients participating in the study. Scorecards will consist of patients' weight, blood pressure, smoking status, cholesterol, micro albumin testing, and completion of annual eye and foot exams and vaccinations.
5. Medical staff will perform hemoglobin A1C lab test and add results on the Diabetes Scorecard.
6. Counselors will meet with patients and administer paper and pencil instruments to the intervention and control groups (D*SMART; Assessment of Care for Chronic Conditions; Diabetes Self-Efficacy Scale, distribute Individual Diabetes Scorecard). Counselors will also send out the instrument adapted from the PACIC for participating physicians, the Physician Assessment of Care.
7. Counselors will review and report patients' scorecard and results of the assessments.

8. C managers will co-develop patients' goals and a plan of care for study period (standardized intake session across care managers).
9. Follow-Up Sessions: On a weekly basis counselors will contact patients either in their home or telephonically. Counselors will assess progress on goals from intake and assess for referral needs. Counselors and patients will discuss topics such as:
    - feelings surrounding management of diabetes,
    - scheduling routine lab work (i.e. glucose and cholesterol checks),
    - making lifestyle changes (i.e. exercise, diet, stress management),
    - scheduling screenings (i.e. eye and foot exams), and
    - vaccinations (i.e. flu, pneumonia).
10. Closing Session: Counselors will assess progress on goals from intake and subsequent visits.
11. The counselors will administer paper-and-pencil instruments (D*SMART; Assessment of Care for Chronic Conditions; Chronic Illness Resource Survey)
12. Counselors will score and submit results of the instruments to the patients and the research coordinator for analysis. The medical staff will calculates Diabetes scorecard value for participating subjects and will perform hemoglobin A1C lab test and add results onto the Diabetes Scorecard. The medical staff will also submit results to research coordinator for analysis.

Appendix B
Interview Protocol

Review of Diabetes Scorecard

We most certainly appreciate your willingness to participate in this study. It is my goal to serve as your case manager for the next eight months. I plan to be a resource that will assist you in obtaining care and developing skills to be a better manager of your diabetes.

How does that sound to you?

Do you have any questions so far?

To begin this process, let discuss your Diabetes Report Card. Do you know what is on this card?

Basically, this card gives a report of your current stance on several items. It shows here your current weight, blood pressure, Hemoglobin A1C, smoking status, and level of bad cholesterol. It also tells whether you have had you your yearly eye, foot and urine protein exams, and if you have received your flu and pneumonia vaccinations.

Would you like for me to further explain any of these items?

For instance, your Hemoglobin A1C is a lab test that gives you a picture of your average blood glucose control for the past 2 to 3 months. As for the LDL, level of bad cholesterol, the higher the level of bad cholesterol, the greater the chance you have of getting heart disease.

Are there any questions you would like for me to answer about A1C or LDL?

Now, your exams are given to check for other factors that work against managing diabetes. Urine screenings looks for a type of protein called microalbumin. Eye exams are given to check for retinopathy and foot exams gives your physician a chance to see if you have any foot injuries that may be made worse by your diabetes.

How do you feel about this information thus far? Do you need me to talk more about any part of the report card?

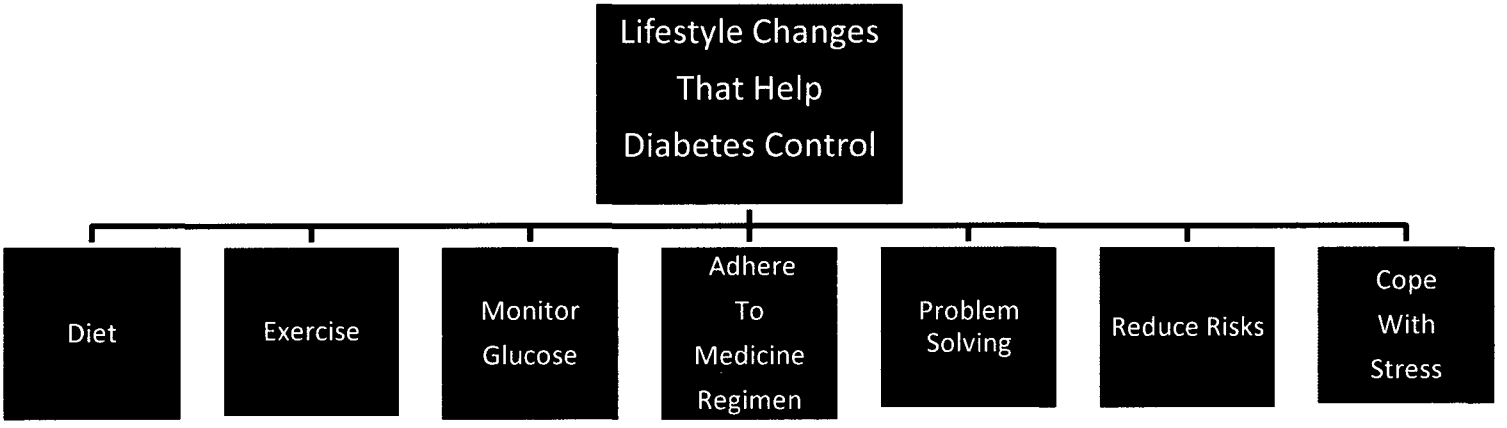
Would you like to take a look at how you scored on these items and compare them to the goal average?

Formulation of Plan of Care

Now that we have explored your current medical status in regards to your diabetes, we can focus on changes that can be made in your lifestyle that will help you become a stronger self-manager of your diabetes.

From the Diabetes Self-Management Assessment Tool, we were able to gather a lot of information on how you are currently managing your diabetes, what you feel are areas of concern, and how strongly you feel you will be able to work on improving those areas.

How do you feel about exploring these areas more thoroughly?
There are seven dimensions of your lifestyle, which directly affects the management of your diabetes.



From the DSMART we can see that you feel that the following _____ areas are well managed and under control. You also express that you feel strongly about be able to continue being successful in those aspects of your lifestyle.

Would you agree with what showed up on the assessment?

And then there are these areas (x,y,z) that are not as well managed or controlled. It also appears that you do not feel as confident in being able to turn these areas into successful areas.

Would you like to discuss what has been a barrier in this aspect of your lifestyle and diabetes management?

OR

And then there are these areas (x,y,z) that are not as well managed or controlled. It also appears that you do; however, feel confident that you will be able to make changes in this part of your lifestyle to become a better self-manager.

Would you like to brainstorm ways to improve those areas and set up your care plan to organize a way to put your ideas into action?

Appendix C
Care Plan

Patient Name: _____ ID #_____Date: _____

	Last Done	Next Due	Plan	Notes
Lab Work: • A1C				
• Lipid Profile (fasting)				
• Urine Microalbumin				

	Last Done	Proposed Date	Completion Date	Notes
Eye Exam				
Flu Vaccine				
Pneumonia Vaccine				
Foot Exam				
Diabetes Educator				
Social Worker				
Other Specialist [ ]				
Other Specialist [ ]				

This plan has been discussed and developed in collaboration with _____ who agrees to its implementation ***ID#***

_____ _____
Patient **Date**

_____ _____
Care Manager **Date**

Plan for Making Lifestyle Changes:

Patient Name: _____ ID #_____Date: _____

I would like to work on the following areas:

_____ Exercise

_____ Eating

_____ Taking medications properly

_____ Monitoring blood sugars

_____ Problem-solving

_____ Reducing risks of complications from diabetes

_____ Reducing stress/living with diabetes

Goals set: 1. _____ Date: _____

2. _____Date: _____

3. _____ Date: _____

Progress on Goals:

Goals	Progress	Comments

This plan has been discussed and developed in collaboration with _____who agrees to its implementation ***ID#***

_____ _____

Patient **Date**

_____ _____

Care Manager **Date**

Care Plan Summary

Patient Name: _____ ID # _____ Date: ___

Written in first person

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

This plan has been discussed and developed in collaboration with _____ who agrees to its implementation ***ID#***

_____ _____

Patient **Date**

_____ _____

Care Manager **Date**

Appendix D
Recruitment Letter

Greetings

My name is Ularisi Green, and I am a student at Old Dominion University in the Counselor Education doctoral program.

In effort to complete my dissertation, I have partnered with Eastern Virginia Medical School and Portsmouth Family Practice to study the effects of counseling people with poorly controlled diabetes. To implement the project, which will take place August 2009 to March 2010, I am requesting your participation.

As a participating Care Manager, **you would be allowed to count all hours collected in this study toward your practicum/ internship requirements**.

You would be given the opportunity to be supervised and trained by a team of health care professionals (medical doctors, psychologists, registered nurses, and diabetes educators, pharmacists, and counselors). The project offers:

- Training in Motivational Interviewing tailored to counseling people with poorly controlled diabetes
- Education on diabetes, its effects, and successful management practices
- Approximately 20 of direct and indirect hours per month for the duration of the program
- Networking and collaboration on treatment strategies with primary care staff (i.e. physicians and nurses) and diabetes management professionals (nutritionists, diabetes educators, fitness specialists)

All training, support, and supervision is provided by the project team; therefore, no prior experience with this population or intervention method is required.

If you are interested in being a part of this opportunity, please contact me via the information listed below.

Thank you in advance for your consideration,

Ularisi Green, M.A.
757-535-1671
ugreen@odu.edu

Advertising approved by the EVMS IRB. 09-06-EX-0127

Appendix E
Protocol for Recruitment Calls

Good (Morning/Afternoon/Evening) Mr./Ms. _____

My name is _____, and I am calling from ____. I am working your primary care physician, Dr. _____. S/He suggested that I call to see if you are interested in a program we are starting to help patients manage their diabetes more effectively.

If you decide to be a participant, you will receive two free A1C lab tests and would have a chance at being assigned a counselor who will be your care manager and will assist you with topics such as:

- Your feelings surrounding management of diabetes,
- scheduling routine lab work (i.e. glucose and cholesterol checks),
- making lifestyle changes (i.e. exercise, diet, stress management),
- scheduling screenings (i.e. eye and foot exams), and
- vaccinations (i.e. flu, pneumonia).

You will be asked to fill out 3 surveys at the beginning and end of the program. One to see how you are currently managing your diabetes, one to examine how you feel about the care your physician's offices gives, and the last one measures whether you feel you are able to manage your diabetes.

The program will last 6 months. During that time, you will have contact with you care manager on a weekly basis. They will either meet with you at the office, in your home or keep in contact with you by the phone.

Do you think you would like to be a participant in this program?

According to response

(If Patient Agrees) Great! We will begin the initial session at ____ on DATE. It will take approximately 1 hour to get your lab work and complete the assessments. What day and at what time would you be available?

Proceed to gather contact information

(If Patient Denies) Well, Mr./Ms. _____ I certainly appreciate you talking with me. If you happen to reconsider, please feel free to contact your physician. I wish you well.

Voicemail

Good (Morning/Afternoon/Evening) Mr./Ms. _____

My name is _____, and I am calling from _____. I am working your primary care physician, Dr. _____. S/He suggested that I call to see if you are interested in a program we are starting to help patients manage their diabetes more effectively.

When you are able, please feel free to give me a call back at (your number). I look forward to hearing from you soon!

Appendix F

Physicians' Assessment of Chronic Illness Care

We would like to learn about the type of care provided by your health care team to patients with Chronic Conditions. Please read the questions below and answer them based on the services provided over the past 6 months. All answers will be kept confidential as outlined in your consent form.

PHYSICIANS' ASSESSMENT OF CARE FOR CHRONIC ILLNESS CARE

Over the past 6 months, when our health care team provided care for my patient, we:

1. Asked for patients' ideas when we made treatment plans.

   ○None of the time ○A little of the time ○Some of the time ○Most of the Time ○Always

2. Gave choices about treatment to think about.

   ○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

3. Asked to talk about any problems with medications or their side effects.

   ○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

4. Gave a written list of things to be done to improve health.

   ○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

5. Satisfied that the care provided was organized.

   ○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

6. Showed patients how what they did to take care of themselves influenced their condition.

   ○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

7. Asked to talk about patients' goals in caring for their condition.

   ○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

8. Helped patient to set specific goals to improve their eating or exercise.

   ○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

9. Gave patients a copy of their treatment plans.

   ○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

10. Encouraged patient to go to specific groups or class to help them cope with their condition.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

11. Asked patients questions, either directly or on a survey, about their health habits.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

12. Thought about patients' values, beliefs, and traditions when recommending treatments.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

13. Helped patient make a treatment plan that they could carry out in their daily lives.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

14. Helped patient plan ahead so they could take care of their condition even in hard times.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

15. Asked how patients' chronic condition affects their life.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

16. Contacted patients after a visit to see how things were going.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

17. Encouraged patients to attend programs in the community that could help them.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

18. Referred patients' to a dietician, health educator, or counselor.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

19. Told patients' how their visits with other types of doctors, like an eye doctor or surgeon, helped their treatment.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

20. Asked patients' how their visits with other doctors were going.

○None of the time ○A little of the time ○Some of the time ○Most of the time ○Always

---

*Adapted from McColl Institute for Healthcare Innovation, Group Health Cooperative, 2004

Appendix G

Assessment of Care for Chronic Conditions

Staying healthy can be difficult when you have a chronic condition. We would like to learn about the type of help with your condition you get from your health care team. This might include your regular doctor, his or her nurse, or physician's assistant who treats your illness. Your answers will be kept confidential and will not be shared with your physician or clinic.

Over the past 6 months, when I received care for my chronic conditions, I was:

	None of the time	A Little of the Time	Some of the Time	Most of the Time	Always
1. Asked for my ideas when we made a treatment plan.	☐1	☐2	☐3	☐4	☐5
2. Given choices about treatment to think about.	☐1	☐2	☐3	☐4	☐5
3. Asked to talk about any problems with my medicines or their effects.	☐1	☐2	☐3	☐4	☐5
4. Given a written list of things I should do to improve my health.	☐1	☐2	☐3	☐4	☐5
5. Satisfied that my care was well organized.	☐1	☐2	☐3	☐4	☐5
6. Shown how what I did to take care of myself influenced my condition.	☐1	☐2	☐3	☐4	☐5
7. Asked to talk about my goals in caring for my condition.	☐1	☐2	☐3	☐4	☐5
8. Helped to set specific goals to improve my eating or exercise.	☐1	☐2	☐3	☐4	☐5
9. Given a copy of my treatment plan.	☐1	☐2	☐3	☐4	☐5
10. Encouraged to go to a specific group or class to help me cope with my chronic condition.	☐1	☐2	☐3	☐4	☐5
11. Asked questions, either directly or on a survey, about my health habits.	☐1	☐2	☐3	☐4	☐5

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Over the past 6 months, when I received care for my chronic conditions, I was:

	None of the time	A Little of the Time	Some of the Time	Most of the Time	Always
12. Sure that my doctor or nurse thought about my values, beliefs, and traditions when they recommended treatments to me.	☐1	☐2	☐3	☐4	☐5
13. Helped to make a treatment plan that I could carry out in my daily life.	☐1	☐2	☐3	☐4	☐5
14. Helped to plan ahead so I could take care of my condition even in hard times.	☐1	☐2	☐3	☐4	☐5
15. Asked how my chronic condition affects my life.	☐1	☐2	☐3	☐4	☐5
16. Contacted after a visit to see how things were going.	☐1	☐2	☐3	☐4	☐5
17. Encouraged to attend programs in the community that could help me.	☐1	☐2	☐3	☐4	☐5
18. Referred to a dietitian, health educator, or counselor.	☐1	☐2	☐3	☐4	☐5
19. Told how my visits with other types of doctors, like an eye doctor or surgeon, helped my treatment.	☐1	☐2	☐3	☐4	☐5
20. Asked how my visits with other doctors were going.	☐1	☐2	☐3	☐4	☐5

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Appendix H

D-SMART Overview

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D-SMART Overview

Last Update: 3/19/2006

Demographic Information

Health History

Diabetes Health Status

Risk Factor Reduction

Past Three Months

- Exercise / Physical Activity
- Eating
- Medication
- Problem Solving High Blood Sugar
- Problem Solving Low Blood Sugar
- Monitoring
- Problem Solving Sick Days
- Living with Diabetes
- Making Changes Part 1
- Making Changes Part 2

Miscellaneous

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D-SMART Version 2.0 Test 3/19/07

Demographic Information

What is your race? (check all that apply)

- ☐ American Indian or Alaskan Native
- ☐ Asian/Chinese/Japanese/Korean/ Pacific Islander
- ☐ Black/African American
- ☐ Hispanic/Chicano/Cuban/Mexican/ Puerto Rican/Latino
- ☐ White/Caucasian
- ☐ Other
- ☐ Don't Know
- ☐ None of the above

Education (mark highest level completed)

- ☐ Elementary school
- ☐ Some high school
- ☐ High school degree
- ☐ Some college
- ☐ College degree
- ☐ Post graduate

What is your occupation? (mark only one)

- ☐ Clerical
- ☐ Homemaker
- ☐ Sales
- ☐ Professional / Managerial
- ☐ Skilled labor
- ☐ Other labor
- ☐ Student
- ☐ Unemployed
- ☐ Retired
- ☐ Disabled
- ☐ Other

Do you have any physical limitations? (check all that apply)

- ☐ Hearing problems
- ☐ Vision loss (not corrected by glasses or contacts)
- ☐ Problems with use of hands
- ☐ Problems with use of feet
- ☐ None of the above

Health History

Have you ever been diagnosed, ever been told, or have you had problems with the following (check all that apply)

- ☐ High Blood Pressure
- ☐ Heart Disease/Chest Pain
- ☐ Stroke
- ☐ High Cholesterol
- ☐ Thyroid Disease
- ☐ Problems with sexual function
- ☐ Kidney/Bladder problems
- ☐ Asthma
- ☐ Shortness of Breath
- ☐ Eye or vision problems
- ☐ Numbness/pain/tingling of hands/ feet
- ☐ Other foot problems
- ☐ Frequent nausea, vomiting, constipation, diarrhea
- ☐ Depression or anxiety
- ☐ Other health problems
- ☐ Surgery in the last 5 years
- ☐ Drug Allergies
- ☐ None of the above

What is your height? ____ feet ____ inches

What is your weight? ____

Do you currently smoke cigarettes, cigars, or use tobacco?

- ☐ Every day
- ☐ Some days
- ☐ Not at all

Have you smoked within the last 6 months?

- ☐ Yes
- ☐ No

How often do you drink alcohol?

- ☐ Never
- ☐ Less than once a week
- ☐ Once a week
- ☐ Once a day
- ☐ Two or more drinks every day

Women's Health (check all that apply)

- ☐ Using birth control
- ☐ Planning pregnancy
- ☐ Fertility drugs
- ☐ Pregnant
- ☐ Sexually inactive
- ☐ Infertile
- ☐ Menopause
- ☐ History of gestational diabetes

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Other

None of the above

Had counseling about what to do before getting pregnant

Diabetes Health Status

Have you had diabetes education? Yes No

What year were you told you had diabetes?

Number of emergency room visits or 911 calls to paramedics for high or low blood sugar within the last 3 months?

Number of days missed from work, school or usual routine because of diabetes within the last 3 months?

Number of hospital admissions for diabetes within the last 3 months?

Risk Factor Reduction

How often do you closely examine or look at your feet with your socks off? Daily Several times a week A few times a month Once in a while Never

When was the last time you had the following health services to prevent problems? (mark all that apply)

Saw a diabetes educator Never Last 6 months Last year Over a year ago Don't know

Saw a health care provider (doctor, nurse practitioner, physician's assistant) Never Last 6 months Last year Over a year ago Don't know

Saw a dentist Never Last 6 months Last year Over a year ago Don't know

Saw a dietitian Never Last 6 months Last year Over a year ago Don't know

Had my eyes checked by an eye doctor Never Last 6 months Last year Over a year ago Don't know

Had my feet checked by a health care provider Never Last 6 months Last year Over a year ago Don't know

Had my cholesterol checked Never Last 6 months Last year Over a year ago Don't know

Results: Total

Results: HDL

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Results: LDL

Had my triglycerides checked
- ☐ Never
- ☐ Last year
- ☐ Don't know
- ☐ Last 6 months
- ☐ Over a year ago

Result given to you by the health care provider

Had my blood pressure checked
- ☐ Never
- ☐ Last year
- ☐ Don't know
- ☐ Last 6 months
- ☐ Over a year ago

Result given to you by the health care provider

OVER

Had an A1C test
- ☐ Never
- ☐ Last year
- ☐ Don't know
- ☐ Last 6 months
- ☐ Over a year ago

Result given to you by the health care provider

Had my urine checked for protein
- ☐ Never
- ☐ Last year
- ☐ Don't know
- ☐ Last 6 months
- ☐ Over a year ago

Had a flu vaccine
- ☐ Never
- ☐ Last year
- ☐ Don't know
- ☐ Last 6 months
- ☐ Over a year ago

Had a pneumonia vaccine
- ☐ Never
- ☐ Last year
- ☐ Don't know
- ☐ Last 6 months
- ☐ Over a year ago

Had counseling about what to do before getting pregnant (if female and able to get pregnant)
- ☐ Never
- ☐ Last year
- ☐ Don't know
- ☐ Last 6 months
- ☐ Over a year ago

Had a complete physical exam
- ☐ Never
- ☐ Last year
- ☐ Don't know
- ☐ Last 6 months
- ☐ Over a year ago

Past Three Months

Exercise / Physical Activity

During a week, how many days do you exercise?
☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

How long do you usually exercise?
- ☐ 1-15 minutes
- ☐ 31-45 minutes
- ☐ More than an hour
- ☐ 16-30 minutes
- ☐ 46-60 minutes

Type of Exercise (check all that apply)
- ☐ Walking
- ☐ Swimming
- ☐ Dancing
- ☐ Tennis
- ☐ Weight lifting/Strength training
- ☐ Other
- ☐ Running
- ☐ Golfing
- ☐ Bike riding
- ☐ Sports (basketball, softball, etc.)
- ☐ Aerobics
- ☐ None of the above

Eating

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How often do you miss or skip a meal or scheduled snack?	Daily	Several times a week
	A few times a month	Once in a while
	Never	
How often do you eat foods high in fat, like fried foods or lots of butter?	Daily	Several times a week
	A few times a month	Once in a while
	Never	
How often do you eat more then you think you should?	Daily	Several times a week
	A few times a month	Once in a while
	Never	

Medication

Do you take diabetes medication?	Don't take medication	Pills only
	Pills and insulin	Insulin only
How often do you miss or skip a dose of your diabetes medication?	Daily	Several times a week
	A few times a month	Once in a while
	Never	
How often do you take your diabetes medication later than planned?	Daily	Several times a week
	A few times a month	Once in a while
	Never	
Do you take aspirin daily, or every other day?	Yes	No
Do you have glucagon?	Yes	No

Problem Solving High Blood Sugar

Do you check your blood sugar?	Yes	No
When you check your blood sugar, what blood sugar level do you consider too high?	I don't know	Over 100
	Over 125	Over 150
	Over 175	Over 200
	Over 250	
How often do you have high blood sugar?	Daily	Several times a week
	A few times a month	Once in a while
	Never	Don't know
When your blood sugar is too high, what do you usually do? (check all that apply)	Change diet	Change exercise
	Increase diabetes medication	Check meter / strips
	Call my health care provider	Test my ketones
	Not Sure	None of the above
When your blood sugar is high, how often are you able to get it back down to where you want it?	Every Time	Most Times
	Some Times	Never

Problem Solving Low Blood Sugar

When you check your blood sugar, what blood sugar level do you consider too low?	I don't know	Under 100
	Under 90	Under 80
	Under 70	Under 60
	Under 50	(I don't check my sugar)
How often do you have low blood sugar?	Daily	Several times a week
	A few times a month	Once in a while
	Never	Don't know

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Do you wear a bracelet to or keepsomething with you to identify that you have diabetes?

- ☐ Yes
- ☐ No

When your blood sugar is too low, what do you usually do? (check all that apply)

- ☐ Eat more
- ☐ Reduce diabetes medication
- ☐ Check meter or strips
- ☐ Not sure
- ☐ Stop exercise
- ☐ Call health care provider
- ☐ I take glucose
- ☐ None of the above

When your blood sugar is low, how often are you able to get it up to where you want it within 1/2 hour?

- ☐ Every Time
- ☐ Some Times
- ☐ Most Times
- ☐ Never

Monitoring

Do you use a meter to test your blood sugar?

- ☐ Yes
- ☐ No

How often do you usually check your blood sugar?

- ☐ 4 or more times a day
- ☐ 2 times a day
- ☐ Once a week or less
- ☐ 3 times a day
- ☐ Once a day
- ☐ Never

How often do you check your blood sugar later than planned?

- ☐ Daily
- ☐ A few times a month
- ☐ Never
- ☐ Several times a week
- ☐ Once in a while

How often do you miss or skip checking your blood sugar?

- ☐ Daily
- ☐ A few times a month
- ☐ Never
- ☐ Several times a week
- ☐ Once in a while

Problem Solving Sick Days

When you are sick or can't eat your usual foods, what do you usually do? (check all that apply)

- ☐ Replace usual food with carbohydrates or sugar
- ☐ Take diabetes medication
- ☐ Check blood sugar more often
- ☐ Not sure
- ☐ Drink more water
- ☐ Check ketone level
- ☐ Contact health care provider
- ☐ None of the above

Living with Diabetes

Please tell us how you feel about your diabetes (mark one for each question).

How sure are you that you can manage your diabetes?

- ☐ A lot
- ☐ A little
- ☐ Some
- ☐ Not at all

How much do you feel your family/friends support your efforts for diabetes control?

- ☐ A lot
- ☐ A little
- ☐ Some
- ☐ Not at all

How much do you feel your medical team supports your efforts for diabetes control?

- ☐ A lot
- ☐ A little
- ☐ Some
- ☐ Not at all

Please tell us how diabetes affects your life (mark one for each question).

How much does diabetes interfere with your job, school, or daily activities?

- ☐ A lot
- ☐ A little
- ☐ Some
- ☐ Not at all

How does diabetes reduce your well being?

- ☐ A lot
- ☐ A little
- ☐ Some
- ☐ Not at all

How much does your diabetes seem out of control?

- ☐ A lot
- ☐ A little
- ☐ Some
- ☐ Not at all

How much are you afraid you will get complications?

- ☐ A lot
- ☐ A little
- ☐ Some
- ☐ Not at all

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How often do you feel overwhelmed by your diabetes?
- ☐ A lot
- ☐ Some
- ☐ A little
- ☐ Not at all

How often do you feel depressed?
- ☐ A lot
- ☐ Some
- ☐ A little
- ☐ Not at all

How much does your diabetes interfere with sexual function?
- ☐ A lot
- ☐ Some
- ☐ A little
- ☐ Not at all

Making Changes Part 1

Having diabetes means you may need to make changes. What changes, if any, would you like to make now? (check all that apply)
- ☐ Activity
- ☐ Eating
- ☐ Medication taking
- ☐ Monitoring
- ☐ Problem solving for blood sugars and sick days
- ☐ Reducing risks of diabetes complications
- ☐ Living with diabetes
- ☐ I don't know what to change
- ☐ None of the above

Activity

Exercise more often
- ☐ I am interested in making this change

How confident are you that you can exercise more often
- ☐ Sure I can
- ☐ Think I can
- ☐ Not sure I can
- ☐ Don't think I can

Exercise longer
- ☐ I am interested in making this change

How confident are you that you can exercise longer
- ☐ Sure I can
- ☐ Think I can
- ☐ Not sure I can
- ☐ Don't think I can

Eating

Follow my eating schedule better
- ☐ I am interested in making this change

How confident are you that you can follow your eating schedule better
- ☐ Sure I can
- ☐ Think I can
- ☐ Not sure I can
- ☐ Don't think I can

Eat better food
- ☐ I am interested in making this change

How confident are you that you can eat better food
- ☐ Sure I can
- ☐ Think I can
- ☐ Not sure I can
- ☐ Don't think I can

Overeat less often
- ☐ I am interested in making this change

How confident are you that you can overeat less often
- ☐ Sure I can
- ☐ Think I can
- ☐ Not sure I can
- ☐ Don't think I can

Medication taking

Miss fewer medications
- ☐ I am interested in making this change

How confident are you that you can miss fewer medications
- ☐ Sure I can
- ☐ Think I can
- ☐ Not sure I can
- ☐ Don't think I can

Take medications on time more often
- ☐ I am interested in making this change

How confident are you that you can take medications on time more often
- ☐ Sure I can
- ☐ Think I can
- ☐ Not sure I can
- ☐ Don't think I can

Montoring

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Check my blood sugar more often	☐ I am interested in making this change	
How confident are you that you can check your blood sugar more often	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can
Miss fewer blood sugar checks	☐ I am interested in making this change	
How confident are you that you can miss fewer blood sugar checks	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can
Do my blood sugar checks on time more often	☐ I am interested in making this change	
How confident are you that you can do my blood sugar checks on time more often	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can

Problem solving for blood sugars and sick days

Prevent high blood sugars	☐ I am interested in making this change	
How confident are you that you can prevent high blood sugars	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can
Treat high blood sugars	☐ I am interested in making this change	
How confident are you that you can treat high blood sugars	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can
Prevent low blood sugars	☐ I am interested in making this change	
How confident are you that you can prevent low blood sugars	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can
Treat low blood sugars	☐ I am interested in making this change	
How confident are you that you can Treat low blood sugars	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can
Manage diabetes when sick	☐ I am interested in making this change	
How confident are you that you can manage diabetes when sick	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can

Reducing risks of diabetes complications

Get preventative help	☐ I am interested in making this change	
How confident are you that you can get preventative help	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can
Stop smoking	☐ I am interested in making this change	
How confident are you that you can stop smoking	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can
Check my feet	☐ I am interested in making this change	
How confident are you that you can check your feet	☐ Sure I can ☐ Not sure I can	☐ Think I can ☐ Don't think I can

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Lose weight	☐ I am interested in making this change	
How confident are you that you can lose weight	☐ Sure I can	☐ Think I can
	☐ Not sure I can	☐ Don't think I can
Get blood pressure under control	☐ I am interested in making this change	
How confident are you that you can get blood pressure under control	☐ Sure I can	☐ Think I can
	☐ Not sure I can	☐ Don't think I can
Learn to have a safe pregnancy	☐ I am interested in making this change	
How confident are you that you can learn to have a safe pregnancy	☐ Sure I can	☐ Think I can
	☐ Not sure I can	☐ Don't think I can

Living with diabetes

Being able to cope with diabetes	☐ I am interested in making this change	
How confident are you that you can cope with diabetes	☐ Sure I can	☐ Think I can
	☐ Not sure I can	☐ Don't think I can
Get support from my medical team	☐ I am interested in making this change	
How confident are you that you can get support from my medical team	☐ Sure I can	☐ Think I can
	☐ Not sure I can	☐ Don't think I can
Get support from family/friends	☐ I am interested in making this change	
How confident are you that you can get support from family/friends	☐ Sure I can	☐ Think I can
	☐ Not sure I can	☐ Don't think I can

Making Changes Part 2

How much do the following things keep you from making the changes you want? (mark one answer for each question)

I don't know what to do or how to do it	☐ A lot	☐ Some
	☐ A little	☐ Not at all
It's too hard	☐ A lot	☐ Some
	☐ A little	☐ Not at all
I don't have the time	☐ A lot	☐ Some
	☐ A little	☐ Not at all
My health is not good	☐ A lot	☐ Some
	☐ A little	☐ Not at all
I can't see well enough to do it	☐ A lot	☐ Some
	☐ A little	☐ Not at all
I can't afford it	☐ A lot	☐ Some
	☐ A little	☐ Not at all
No place to do it	☐ A lot	☐ Some
	☐ A little	☐ Not at all
I don't have the will power	☐ A lot	☐ Some
	☐ A little	☐ Not at all
My family / friends don't support me	☐ A lot	☐ Some

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	☐ A little	☐ Not at all
I can't remember to do it	☐ A lot ☐ A little	☐ Some ☐ Not at all
It's too uncomfortable	☐ A lot ☐ A little	☐ Some ☐ Not at all
It's not that important	☐ A lot ☐ A little	☐ Some ☐ Not at all
I don't enjoy it	☐ A lot ☐ A little	☐ Some ☐ Not at all

Miscellaneous

This form was completed by?	☐ Me	☐ Other (preferably not a health care provider)
Date completed		

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Appendix I

Diabetes Self-Efficacy Scale.

This survey asks you to rate your degree of confidence for being able to carry out your diabetes-related activities. **There are no right or wrong answers**. After reading each statement, circle the number that best expresses your belief.

1 = **strongly agree.** 2 = **moderately agree.** 3 = **slightly agree**
6 = **strongly disagree** 5 = **moderately disagree** 4 = **slightly disagree.**

1	I can carry out practically all of the self-care activities in my daily diabetes routine.	1	2	3	4	5	6
2	I am confident in my ability to manage my diabetes.	1	2	3	4	5	6
3	I feel unsure about having to use what I know about diabetes self-treatment every day.	1	2	3	4	5	6
4	I don't think I can follow my diabetes routine every single day.	1	2	3	4	5	6
5	I can stay on my diabetic diet when I eat in familiar places away from home (such as a friend's house).	1	2	3	4	5	6
6	I can stay on my diabetic diet when I eat in unfamiliar places.	1	2	3	4	5	6
7	I'm not sure I'll be able to stay on my diabetic diet when the people around me don't know that I have diabetes.	1	2	3	4	5	6
8	I'm not sure I'll be able to follow my diabetic diet every day.	1	2	3	4	5	6
9	When I go to parties, I can follow my diet plan.	1	2	3	4	5	6
10	I can exercise several times a week.	1	2	3	4	5	6
11	I can't exercise unless I feel like exercising.	1	2	3	4	5	6

1 = **strongly agree.** 2 = **moderately agree.** 3 = **slightly agree**
6 = **strongly disagree.** 5 = **moderately disagree.** 4 = **slightly disagree.**

12	I can figure out when to call my doctor about problems with my feet.	1	2	3	4	5	6
13	I can recognise when my blood sugar is too high.	1	2	3	4	5	6
14	When I feel sick, I can test my blood more than I routinely do.	1	2	3	4	5	6
15	I can do what was recommended to prevent low blood sugar reactions.	1	2	3	4	5	6
16	I can figure out what self-treatment to administer when my blood sugar gets higher than it should be.	1	2	3	4	5	6
17	I can fit my diabetes self-treatment routine into my usual lifestyle.	1	2	3	4	5	6
18	I think I'll be able to follow my diabetes plan even when my daily routine changes.	1	2	3	4	5	6

Thank you

Appendix J

EVMS
HEALTH SERVICES
Patient-Centered Quality Care

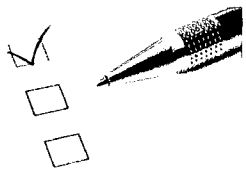
Diabetes Scorecard

MR#: Age: 73 Sex: Male

Subject	Goals	
Vital Signs		
Blood Pressure	Having your blood pressure checked regularly and taking action to reach your blood pressure target can prevent or delay diabetes problems. Goal: Less than 130/80	136 71
Weight	nearly 9 out of 10 people with newly diagnosed type 2 diabetes are overweight? If you are overweight, losing some weight could help you better manage your diabetes. Goal: Per Physician	254
Smoking Cessation	Smoking can aggravate many problems that people with diabetes already face, such as heart and blood vessel disease. Goal: Quit Smoking!	
Labs		
Hemoglobin A1c (Sugar for 3 months)	This lab test gives you a picture of your average blood glucose control for the past 2 to 3 months. Goal: 6.5 or less	7.3
LDL (Lousy or BAD Cholesterol)	The higher the LDL level in your blood, the greater chance you have of getting heart disease. Goal: Less than 70	54
Urine Protein Screening	A microalbumin urine test is done yearly to check for protein (albumin) in the urine. Goal: Less than 30 milligrams (mg) of albumin in 24 hours	
Important Yearly Activities		
Eye Examination	*Only optometrists and* ophthalmologists can detect the signs of retinopathy. Goal: See your eye care professional at least once a year for a dilated eye exam	

EVMS
HEALTH SERVICES
Patient-Centered Quality Care

Diabetes Scorecard



Foot Exam		**Inspect your feet every day, and seek care early if you do get a foot injury. Make sure your health care provider checks your feet at least once a year**	**04/22/2008**
			09/20/2007
			09/20/2007
			09/20/2007
			12/20/2007
			12/20/2007
			12/20/2007
			12/20/2007
Flu Vaccine		**Having the flu can be dangerous for anyone. But it is extra risky for people with diabetes. every person with diabetes needs a flu shot each year**	11/21/2007

Special Vaccination

Appendix K

Holiday Survival Kit!

Greetings (patient's name)

While the holidays can be the most wonderful time of the year, they can also be the most stressful. 'Tis the season for shopping, decorating, parties, and cooking. Tempting treats are everywhere. Exercise plans are put on the back burner. For anyone, these are the ingredients for diet disaster. For some, another problem is added to the mix.

Having diabetes, you know that the holidays can be an especially tricky time of year to manage your health. With some careful planning and smart choices, however, you can make sure that your holidays are both happy and healthy. Now that the season is upon us, attached are tips and resources you can use to manage your diabetes.

It has been a pleasure to work with you thus far and I am looking forward to witnessing your future successes. Remember that I am here to offer you support and resources throughout this season. If you have any questions, comments or concerns, feel free to contact me or your physician's office via the information listed below.

Thank you for your continued participation.

Be Encouraged,

Care Managers Name
Contact Information

Plan Ahead
The most important thing you can do to manage your diabetes during the holidays is to plan ahead. This way, you can be ready to manage your health in different situations that may come up. What is on your agenda? Are you going out of town? Do your plans include a lot of parties where there will be holiday goodies? If you figure out your schedule ahead of time you will be better prepared to handle each day.

Eat Right
Check your menus! A good meal plan should fit in with your schedule and eating habits. People with diabetes need to eat a variety of foods. This way, you get a balanced amount of the nutrients your body needs - carbohydrates, proteins, fats, vitamins, and minerals.

Carbohydrates (commonly called "carbs") have the biggest effect on your blood sugar. Carbs include breads, beans, fruits, vegetables, and milk - nutritious foods that are part of a healthy diet for all people. Sugar is also a carb. The truth is that sugar has gotten a bad reputation. In 1999, the American Diabetes Association (ADA) reported that sugar could be part of the diet for someone with diabetes. Sugar becomes glucose in your body, but so do the other foods mentioned above. With sugary foods, the rule is *moderation*. Eat too much and your glucose level will go up higher than you expected!

- When going to a party, decide ahead of time what and how much you will eat.
- Have a healthy snack before going out so you don't give in to cravings.
- Decide what foods you want to splurge on. Avoid the other foods that you don't really want or need.
- Fill your plate will healthy things like fruits and veggies. Holiday favorites like pumpkin and turkey are also nutritious and delicious!
- Share a dessert, have only a small amount, or skip the whipped-cream topping.
- Eating healthy is good for everyone, not just diabetics. Bring a low-fat or sugar-free dish at the next holiday party you attend.
- Make your traditional holiday foods healthier. There are plenty of ways to cut sugar, carbs, and fat, while still keeping the taste you love. Some suggestions:
    - Substitute fat-free or light ingredients for regular.
    - Steam vegetables instead of sautéing in butter.
    - When baking, use less sugar in a recipe and increase the use of cinnamon, nutmeg, vanilla, and other sweet-tasting spices and flavorings.
    - Use sugar substitutes to cut carbs and calories
- When you're out shopping, bring along healthy snacks like apples, carrot sticks, or nuts and avoid the food court.

Don't overdo the spirits of the season.
Check with your doctor about drinking alcohol. If your doctor has told you it's OK for you to have an occasional drink, make sure you have food with it and stick to one serving of alcohol. Too much alcohol is bad for you at any time of year. This is because alcohol can cause your blood sugar to drop. This can make you feel sleepy, dizzy, or confused. Alcohol may cause these symptoms shortly after drinking and for 8-12 hours after drinking. If you are going to drink

check your blood glucose first to make sure it is not low. You should also check your blood glucose before you go to bed to make sure it is at a safe level -- between 100 and 140 mg/dL.

Exercise
This is not the time to take a holiday from your daily exercise routine. Being more active helps lower your blood sugar, blood pressure and cholesterol. Exercise is also a great way to beat stress! Although it may be hard to find time for your regular workout, there are a number of ways to stay active:

- Walk
    - Park your car at the far end of the lot
    - Power walk while shopping the mall
    - Take a twilight stroll around your neighborhood to admire the holiday lights
- Try a seasonal activity
    - Snow shoe
    - Ski
    - Build a snowman

Beat Stress
You eat right and exercise, but another holiday problem can cause your blood sugar to soar - stress! With so much to do and so little time, stress is very common. Help yourself to be more relaxed:

- Plan your gift-giving list and shop before Thanksgiving to beat the crowds.
- Save time by shopping online or ordering from catalogs.
- Don't always cook from scratch. Use some mixes, ready-made dough, or pre-cut ingredients to save some time.
- Say no! You don't have to accept every holiday invitation.
- Find some quiet time for yourself every day- listen to favorite carols, have some hot tea, or just sit and watch the snowfall.

Check your blood sugar
It is very important to check your blood sugar regularly during the holiday season. According to the ADA, the ideal blood sugar goals at any time of year are 90-130 mg/dl before eating (fasting values) and less than 180mg/dl two hours after eating. Check with your doctor to find out if your goals are the same. Higher blood sugar readings may indicate that there is a little too much holiday cheer going on!

Tips for Travelers
If you are going away for the holidays, don't forget that diabetes travels with you. Planning ahead for travel is especially important for people with diabetes.

General:

- Remember to get all of your diabetes prescriptions refilled before you go. Make sure to take enough medicines and supplies for the entire trip. If possible, take some extras just

in case. Getting extra diabetes supplies when you're away from home can be difficult. The following checklist may be helpful:
    - Prescription medicines (insulin, pills) for diabetes and other medical conditions.
    - Two blood glucose monitoring devices with extra batteries.
    - Syringes, lancets, and test strips.
    - For insulin pump users: pump supplies, extra batteries, insulin and syringes in case of pump failure.
    - Fast acting sugar such as glucose tablets/gel or candy.
    - Complex carbohydrates (crackers, granola bar, trail mix) in case meals are delayed.
    - Glucagon emergency kit in case of hypoglycemia.
- Always wear or carry some form of medical identification, such as a bracelet. This will tell others you have diabetes in case of an emergency.
- Monitor blood sugars regularly (every 4 hours is recommended).
- Store medicines and supplies near you in a safe place, away from very hot or cold temperatures or direct sunlight. Extreme temperatures can cause damage to diabetes equipment and medicines. This means they may not work as well as they should. This is especially true for insulin.
- Remember your basic rules of foot care. Don't wear new shoes on vacation since you may get blisters. Never go barefoot. Check your feet daily and take care of any cuts or blisters immediately.
- Get up and move around every one to two hours to increase comfort and reduce risk for blood clots.

Air Travel:

- Carry all medicines and equipment with you on the plane. Check-in bags may get lost. Suitcases stored in cargo holds may get very hot or cold.
- Tell the flight attendant that you have diabetes, especially if you are traveling alone. If you are traveling by plane, notify the airline 24 hours in advance for a special diet order.
- Ask for an aisle seat if you will use the restroom for insulin injections.
- Dehydration is common. Drink plenty of non-alcoholic, caffeine-free beverages throughout the flight.
- Because of problems with increased security at airports, get a letter from your doctor explaining your diabetes medicines and supplies. You should also bring the original containers because they usually have a label and pharmacy instructions.
- Make sure someone you travel with knows about your diabetes and how to help you if you have a diabetic emergency.
- Crossing time zones can confuse your insulin schedule. You may want to have a watch that displays two time zones, so you can keep one set at home base time. You may need to adjust your total daily insulin dose and/or to make a new plan for timing your insulin injections.

Enjoy Yourself!

You don't have to let diabetes spoil your celebrations. With a little bit of planning, the holidays can be enjoyed by all. Get caught up in the festivities. Savor time with loved ones. Remember

that a little bit of self-control can help make sure that there are many more happy holidays to come for diabetics and their families.

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http://www.consumer-health.com/services/cons_take45.htm

Resources for Persons with Diabetes and Their Caretakers

Websites

Virginia Chronic Disease and Mental Health Information Center
http://www.vahealth.org/cdpc/Depression/index.htm

American Association of Diabetes Educators: Find a diabetes educator
http://www.diabeteseducator.org/DiabetesEducation/Find.html

National Diabetes Education Program
http://www.ndep.nih.gov/index.htm

American Diabetes Associations
www.diabetes.org

Jewish Diabetes Associations
http://www.jewishdiabetes.org/

Hospitals

Bon Secours Hampton Roads Health System
Diabetes Support Group
Diabetes (MMC)
Every Thursday, 3:30 - 4:30 P.M.
Caridac Wellness & Rehabilitation
Ireton Hall, First Floor - Patient Education Room

"Let's Get Real" Program
Was created by Bon Secours Hampton Roads in response to a recent epidemiology report that revealed above average rates of high blood pressure, diabetes and obesity in Hampton Roads

Sentara
http://www.sentara.com/Sentara/Services/Diabetes/

Diabetes Self-Management Training
Please call 1-800-SENTARA for the "Healthy Living with Diabetes" class schedule information or to register for Sentara Norfolk General, Sentara CarePlex or Leigh Hospitals.

Please call (757) 259-4233 for the "Healthy Living with Diabetes" class schedule information or to register for Sentara Williamsburg Regional Medical Center.

Please call (757) 395-8836 for the "Diabetes and You"

Diabetes Educators
The Sentara Diabetes Program has Diabetes Educators who serve as a resource for the Sentara hospitals as well as coordinate and implement the Diabetes Self-Management Training programs:

Sentara Bayside Hospital Diabetes Educator - Diane Snyder, RD, CDE, (757) 363-6834.	Sentara Norfolk General Hospital Diabetes Educators - Linda Johnson, (757) 388-2639 and Hope Hickam, (757) 388-1950.	Sentara CarePlex Hospital Diabetes Educators –Jackie Wilton, RN, MSN, CDE (757) 827-2160
Sentara Leigh Hospital Diabetes Educator - Deb Nicolosi, RD, CDE (757) 466-6981.	Sentara Hospitals Diabetes Program Manager –Stephanie Jackson, (757) 388-2484.	Sentara Virginia Beach General Hospital Team
Coordinator - Marion Butsavage, RD, CDE, (757) 395-8828 and Diabetes Educators Renee Freeman, RN, BS, CDE (757) 395-8838 and Diane Norwood, CDE (757) 395-8837	Sentara Williamsburg Regional Medical Center Diabetes Educator - Sharon Morgan, RN, CDE (757) 259-4233.	

Community Programs

American Diabetes Association - Greater Hampton Roads
870 Greenbrier Circle, Suite 404, Chesapeake, VA 23320
Christina Borst
(757) 424-6662
(757) 420-0490
Mission Statement: To prevent and cure diabetes and to improve the lives of all people affected by diabetes.

Description: To serve the public with research, information and advocacy as well as to organize fundraising events to support the mission while serving the nearly 120,000 people in Hampton Roads with diabetes and their families.

Appendix L

Contact Letter

Date

Greetings Mr./Ms.

To reintroduce myself, my name is _____, and I am your Care Manager from the Diabetes Program. We appreciated your initial interest and participation in our project; however, I have been unsuccessful at reaching you by the phone number listed in our records.

The Diabetes Management Program does not replace the care you receive from your health care provider. We would like to reconnect with you and with your primary care physician to assist you in better managing your diabetes. Our goal is to help make living with diabetes easier for you.

If you would like to make an appointment that would best fit your schedule, or request a different type of contact (i.e. office visit or phone session), you can reach me at the information listed below. When leaving a voicemail, please feel free to leave your name and phone number where I can best reach you during the day, and I will return your call as soon as I can.

I look forward to hearing from you soon.

In good health,

Diabetes Care Manager

APPENDIX M

Kolmogorov-Smirnov Test Results

Test	Scale	*p*
PACIC		
	Overall	.775
	Activation	.550
	Delivery	.865
	Goals	.991
	Problem-Solving	.799
	Follow-Up	Unable to compute
DSE		
	Overall	.684
	Diet	.996
	Self-treat	.709
	Routine	.227
	Certainty	.641
	Exercise	.778
DSMART		
	Overall	.895
	Eating	.559
	Exercise	.840
	Medication	.272
	Problem-High	.634

	Problem-Low	.853
	Monitoring	.992
	Living	.535
DACIC	Overall	.646
PACIC—pre	Overall	.420
PACIC—post	Overall	.653
Scorecard	Overall	.641
Scorecard	Overall	.641

VITA

Ularisi Rebecca Green was a summa cum laude graduate from Norfolk State University in 2005. She completed the four year Bachelor's Degree in Psychology in three years and received recognition as a Parson's Presidential Scholar. She earned a Master's Degree in Community Counseling from Regent University in 2007.

Ms. Green is a member of the American Counseling Association and the Association for Counselor Education and Supervision. She has attended and presented at national and international conferences. She has collaborated on and coordinated research and writing projects covering topics such as complementary, alternative, and integrative therapies, coping with chronic illness, and experiences of a novice professional.

Ms. Green has served as a student counselor in a variety of settings including primary care physician offices, a domestic violence facility, a pregnancy shelter for teen mothers, and an in-home counseling agency. While attending Old Dominion University's Counseling Ph.D. program, she was awarded a 3-year Ph.D. assistantship. She has taught master's level counseling courses, undergraduate human services courses, and classes for community college students. Ms. Green has also served as an advisor for undergraduate students majoring in Human Services, and as a supervisor to counseling students completing their practicum and internship field experience.