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Illness Representations, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Patient Outcomes for Type 2 Diabetes

Patricia Lynn Hart

ACCEPTANCE

This dissertation, ILLNESS REPRESENTATIONS, EMOTIONAL DISTRESS, COPING STRATEGIES, AND COPING EFFICACY AS PREDICTORS OF PATIENT OUTCOMES IN TYPE 2 DIABETES BY Patricia L. Hart was prepared under the direction of the candidate's dissertation committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Nursing in the Byrdine F. Lewis School of Nursing in the College of Health and Human Sciences, Georgia State University.

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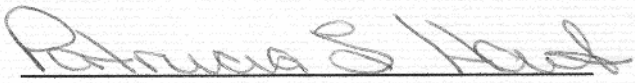

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ABSTRACT

ILLNESS REPRESENTATIONS, EMOTIONAL DISTRESS, COPING STRATEGIES, AND COPING EFFICACY AS PREDICTORS OF PATIENT OUTCOMES IN TYPE 2 DIABETES

by

PATRICIA L. HART

Diabetes mellitus affects 20.8 million Americans in the United States and is the fifth leading cause of death in the United States. Acute and chronic disease-related complications can have a devastating effect on the life of individuals with Type 2 diabetes. Reduction in acute and chronic complications can be best achieved by individuals' adhering to appropriate lifestyle changes and maintaining tight glycemic control through a process of self-regulation. Self-regulation treatment decisions and lifestyle behavioral changes can be influenced by physiological and psychosocial factors.

The purpose of this study was to examine the relationship between illness representations, emotional distress, coping strategies, and coping efficacy as predictors of outcomes (self-care behavior and A1c levels) in individuals with type 2 diabetes.

A descriptive, correlational design was used to examine the relationship between illness representations, emotional distress, coping strategies, and coping efficacy as predictors of outcomes for self-care behavior and metabolic control in individuals with Type 2 diabetes as it relates to diabetes management.

A convenience sample of 119 men (46.2%) and women (53.8%) between the ages of 22 and 93 years of age living in two urban cities located in a southeastern state with documented type 2 diabetes were recruited. Participants were recruited from four endocrinology offices, one internal medicine office, two medical clinics, and three diabetes education centers. The majority of the participants were caucasian (74.8%). Inclusion criteria were that participants (a) had been diagnosed with type 2 diabetes for at least 1 year or more, (b) were able to read and write in English, (c) were 18 years of age or older, and (d) had an A1c level drawn within the past 30 days. Questionnaire booklets were mailed to participants. Participants' A1c levels were obtained from their medical records.

Data were analyzed with descriptive and inferential statistics including frequencies, percentages, means, standard deviations, bivariate correlations, multiple linear regressions, and hierarchical multiple linear regressions. Participants perceived their diabetes to be a chronic, moderately cyclical condition with negative consequences and with moderate amounts of symptomatology that greatly influenced their emotional status. Hierarchical multiple linear regression analysis revealed that coping efficacy uniquely accounted for 9% of the variance in self-care behavior. Perceptions of higher coping efficacy were associated with higher beliefs of personal control and treatment control, a greater understanding of diabetes, engagement in higher levels of self-care behavior, and lower A1c levels. In addition, hierarchical multiple linear regression analysis revealed illness representations, particularly timeline cyclical, accounted for 12% of the variance in A1c levels. Perceptions of

a more cyclical disease course were predicted of higher A1c levels. Interestingly, a perception of diabetes being a less chronic illness was associated with higher self-care behavior.

This study affirms the importance of how illness representations and coping efficacy influence self-care behavior and A1c levels. The findings from this study have important implications for nursing practice in the areas of assessment, diabetes management, coping skills training, behavior modification, motivational interviewing, and diabetes education. Further research is needed to expand the knowledge base and develop targeted interventions related to illness representations, especially timeline cyclical, and coping efficacy in the diabetes population.

ILLNESS REPRESENTATIONS, EMOTIONAL DISTRESS, COPING STRATEGIES, AND COPING EFFICACY AS PREDICTORS OF PATIENT OUTCOMES IN TYPE 2 DIABETES

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Patricia L. Hart

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“To accomplish great things, we must not only act, but also dream; not only plan, but also believe.” …Anatole France

To my loving daughter Amy, you are an inspiration in my life. You are such a giving and loving spirit that embraces life. I am so thankful I have a daughter with such impeccable character and integrity. I am both amazed and delighted at the woman you have become.

"The best and most beautiful things in this world cannot be seen or even heard, but must be felt with the heart." …Helen Keller

I owe special gratitude to my parents, who instilled in me the idea that I could accomplish anything I set my mind to. For giving me the drive to strike forward in life and explore all that life has to offer.

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their time to participate in the research study to help me and other healthcare providers understand what it is like to live with a chronic illness such as diabetes.

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ABBREVIATIONS

A1c	Glycosylated Hemoglobin
ADA	American Diabetes Association
BMI	Body Mass Index
CBT	Cognitive Behavioral Therapy
CDC	Centers for Disease Control and Prevention
CES	Coping Efficacy Scale
COPD	Chronic Obstructive Pulmonary Disease
CSM	Common Sense Model
DM	Diabetes Mellitus
IPQ-R	Illness Perception Questionnaire-Revised
IRB	Institutional Review Board
MI	Motivational Interviewing
PASS	Power Analysis and Sample Size
SDSCA	Summary of Diabetes Self-Care Activities
SPSS	Statistical Package for the Social Sciences
UKPDS	United Kingdom Prospective Diabetes Study
WCQ-R	Ways of Coping Questionnaire-Revised

CHAPTER I

INTRODUCTION

Diabetes mellitus (DM) affects 20.8 million Americans in the United States (Centers for Disease Control and Prevention [CDC], 2005). Diabetes mellitus is a chronic condition that can be life threatening with serious personal and economic costs to individuals from complications such as blindness, heart disease, kidney failure, and limb amputation (Williams & Bond, 2002). Diabetes mellitus is the fifth leading cause of death in the United States (American Diabetes Association [ADA], 2003).

Acute and chronic disease-related complications can have a devastating effect on the life of individuals with type 2 diabetes. Reduction in acute and chronic complications can be best achieved by individuals' adhering to appropriate lifestyle changes and maintaining tight glycemic control. The United Kingdom Prospective Diabetes Study (UKPDS) (1998), a landmark study conducted from 1977 to 1997, examined the effects of tight glycemic control for more than 5,000 people with type 2 diabetes. The UKPDS demonstrated that tight control of blood glucose resulted in a 12% risk reduction for any diabetes-related event. The UKPDS also found that lowering blood glucose levels reduced the risk of retinopathy and nephropathy by 21% and 33%, respectively. In addition, individuals with type 2 diabetes and hypertension who lowered their blood pressure reduced their risk of myocardial infarction by 16%. Overall, the

study demonstrated that for every 1% decrease in glycosylated hemoglobin level (A1c), there was a 35% risk reduction for complications.

A review of the literature conducted by Hentinen (1987) concluded that adherence rates vary from 30% to 80%. Unfortunately, data suggest that individuals with diabetes mellitus do not participate in self-care behavior and do not have tight glycemic control. Therefore, understanding the degree of influence these psychosocial factors have on individuals' decisions to perform self-regulation activities may inform healthcare providers on strategies to encourage better decision-making in individuals with diabetes to prevent acute and chronic complications.

Statement of Problem

Self-regulation in diabetes requires adherence to the prescribed treatment regimen as well as lifestyle behavioral changes. For individuals to take responsibility for their diabetes, they must understand diabetes and its treatment and incorporate their own values, needs, and goals in decisions related to their diabetes (Feste, 1992). Self-regulation treatment decisions and lifestyle behavioral changes can be influenced by physiological and psychosocial factors. Psychosocial factors such as illness representations (Baumann, Han, & Love, 1997; Edgar & Skinner, 2003; Glasgow, Hampson, Stryker, & Ruggiero, 1997; Griva, Myers, & Newman, 2000; Leventhal, Meyer, & Nerenz, 1980; O'Neill, 2002), emotional distress (Grisby, Anderson, Freedland, Clouse, & Lustman, 2002; Karlsen, Bru, & Hanestad, 2002; Roy & Roy, 2001; Thomas, Jones, Scarinci, & Brantley, 2003), coping strategies (Karlsen & Bru, 2002; Lundman, &

Norberg, 1993; Peyrot, McMurray, & Kruger, 1999; Smari & Valtysdottir, 1997; White, Richter, & Fry, 1992), and coping efficacy (Aldwin, Sutton, Chiara, & Spiro, 1996; Gignac, Cott, & Badley, 2000; Keefe et al., 2001; Lefebvre et al., 1999) have been reported to influence self-regulation behavior of individuals with chronic illness. Understanding how psychological factors influence individuals' decisions is vital to assist individuals in caring for their diabetes.

Purpose of Study

The purpose of this study was to examine the relationship between illness representations, emotional distress, coping strategies, and coping efficacy as predictors of outcomes for self-care behavior and metabolic control in individuals with type 2 diabetes.

Significance of the Study

This research was relevant because it expanded the knowledge base in understanding the influences of selected psychosocial factors on the decision-making of individuals to perform self-regulation behavior and the influence of their decisions on metabolic control. The goal of this research was to assist healthcare providers in identifying strategies to help motivate individuals to take responsibility for their diabetes and make informed decisions about choices in self-regulation activities. Motivating individuals to perform self-regulating activities will significantly reduce acute and chronic complications of diabetes, leading to an improved quality of life.

Research Hypotheses

The research hypotheses for the study were based on the theoretical framework of Self-Regulation theory by Leventhal et al. (1980). The hypotheses examined the relationship between illness representations, emotional distress, coping strategies, and coping efficacy as predictors of outcomes (self-care behavior and A1c levels) in individuals with type 2 diabetes, controlling for age and duration of diabetes mellitus.

Main Hypothesis 1: Age, duration of diabetes, illness representations, coping strategies, and coping efficacy will account for a significant amount of the variance in A1c levels in individuals with type 2 diabetes mellitus.

Hypothesis 1A: Illness representations will account for a significant amount of the unique variance in A1c levels over and above coping strategies and coping efficacy, after controlling for age and duration of diabetes.

Hypothesis 1B: Coping strategies will account for a significant amount of the unique variance in A1c levels over and above illness representations and coping efficacy, after controlling for age and duration of diabetes.

Hypothesis 1C: Coping efficacy will account for a significant amount of the unique variance in A1c levels over and above illness representations and coping strategies, after controlling for age and duration of diabetes.

Main Hypothesis 2: Age, duration of diabetes, illness representations, coping strategies, and coping efficacy will account for a significant amount of the variance in self-care behavior in individuals with type 2 diabetes mellitus.

Hypothesis 2A: Illness representations will account for a significant amount of the unique variance in self-care behavior over and above coping strategies and coping efficacy, after controlling for age and duration of diabetes.

Hypothesis 2B: Coping strategies will account for a significant amount of the unique variance in self-care behavior over and above illness representations and coping efficacy, after controlling for age and duration of diabetes.

Hypothesis 2C: Coping efficacy will account for a significant amount of the unique variance in self-care behavior over and above illness representations and coping strategies, after controlling for age and duration of diabetes.

Theoretical Framework

The self-regulation theory by Leventhal et al. (1980) provides a framework to understand factors that influence how people perceive threats of illness and how these perceptions influence their decisions to perform self-regulation behavior and health outcomes. The self-regulation model (see Figure 1) is also known as the common sense model (CSM). Leventhal and colleagues (1980) propose that individuals are problem solvers who strive to achieve and maintain an ideal state of health. Individuals try to make ‘common sense’ of their illness

threats to help manage and solve illness-related problems. The model proposes that during illness two parallel pathways occur. The cognition pathway is the objective interpretation of the illness threat. The emotional pathway is a subjective reaction to the illness threat. The two pathways interact with one another as the individual adapts to the changing situation. According to Leventhal (1980) and colleagues, each parallel pathway has three components: (a) cognitive/emotional representation, (b) coping, and (c) appraisal.

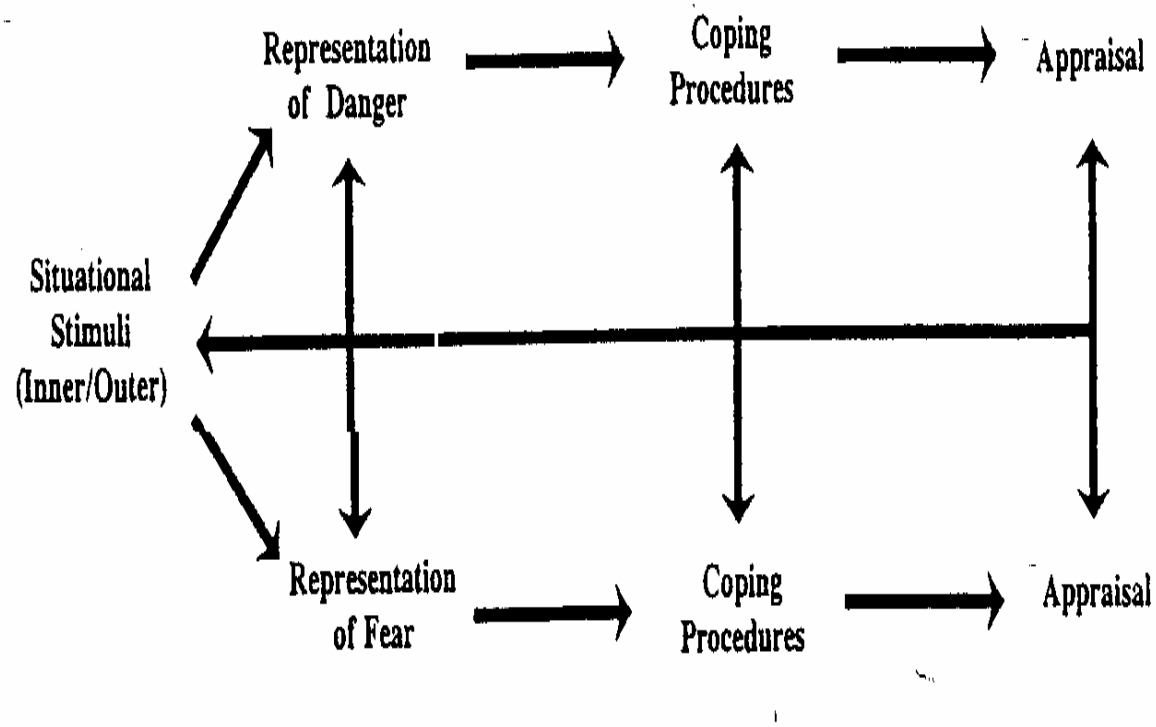

Figure 1. Leventhal's Self-Regulation Model of Illness Appraisal

Cognitive representation is the first component and is conceptually defined as the perception of the illness threat to health based on body sensations or symptoms (Leventhal et al., 1980). Perceptions are constructed on information received from three sources. The first source of information is the acquisition of

‘lay’ information from previous social conversations or cultural knowledge and influences of the illness. The second source of information is generated from significant others or authoritative figures such as nurses and doctors. The third source of information is acquired from the individual’s previous experiences with the illness as well as their current experience with the illness.

Leventhal et al. (1980) describes five themes or dimensions that construct an illness (cognitive) representation. These dimensions are cause, consequences, identity, timeline, and cure/controllability. The cause dimension represents the beliefs of the biological or psychological factors that are responsible for causing the illness or disease. The consequence dimension of the illness is the individual’s beliefs about the impact the illness or disease will have on their quality of life. Identity dimension refers to the concrete and abstract concepts the individual uses to form a label for their illness or disease. Timeline dimension refers to the length of time the individual believes the illness or disease will affect their life. Cure and controllability dimension refers to the ability of the individual to cure or control their illness on their own or with help from others.

A person’s reaction to the internal and external information develops the parallel emotional representation pathway process. The analysis of the information allows the individual to construct a plan for managing the emotional response to the illness (Leventhal et al., 1980; Leventhal, Nerenz, & Steele, 1984).

The next component consists of coping strategies (Leventhal et al., 1980; Leventhal et al., 1984). Individuals engage in coping strategies as an active process in self-regulation of behavior. Coping strategies aim to reduce or prevent the negative aspects of the illness or disease. The feedback loop in the model provides for continued processing of the meaning of the internal and external information to formulate a coping strategy. Coping strategies are influenced by the individual's illness representation and the continuous appraisal of the effectiveness of the coping strategy.

The third component, appraisal, is when the individual evaluates the effectiveness of coping strategies used in the cognitive and emotional pathways. The appraisal component of the model evaluates whether the coping strategies have moved the individual towards or further away from the illness representation (Leventhal et al., 1980; Leventhal et al., 1984).

The components of the self-regulation model are conceptualized as factors that influence outcomes of individuals with type 2 diabetes. Diagnosis of diabetes is the stimuli from the current and previous illness experiences of the individual. The cognitive pathway is reflected by the illness representations or perceptions of the illness by the individual. The emotional pathway is reflected by the emotional distress the individual experiences when dealing with the illness or disease. Coping is represented by the coping strategies used by the individual. Coping efficacy is reflected by the perceived beliefs that the individual has used effective coping strategies in the past and can use effective coping strategies in the future to handle diabetes-related problems. Glycosylated hemoglobin level

and participation with self-regulating activities are the outcomes for the model. Figure 2 depicts the model for the proposed study.

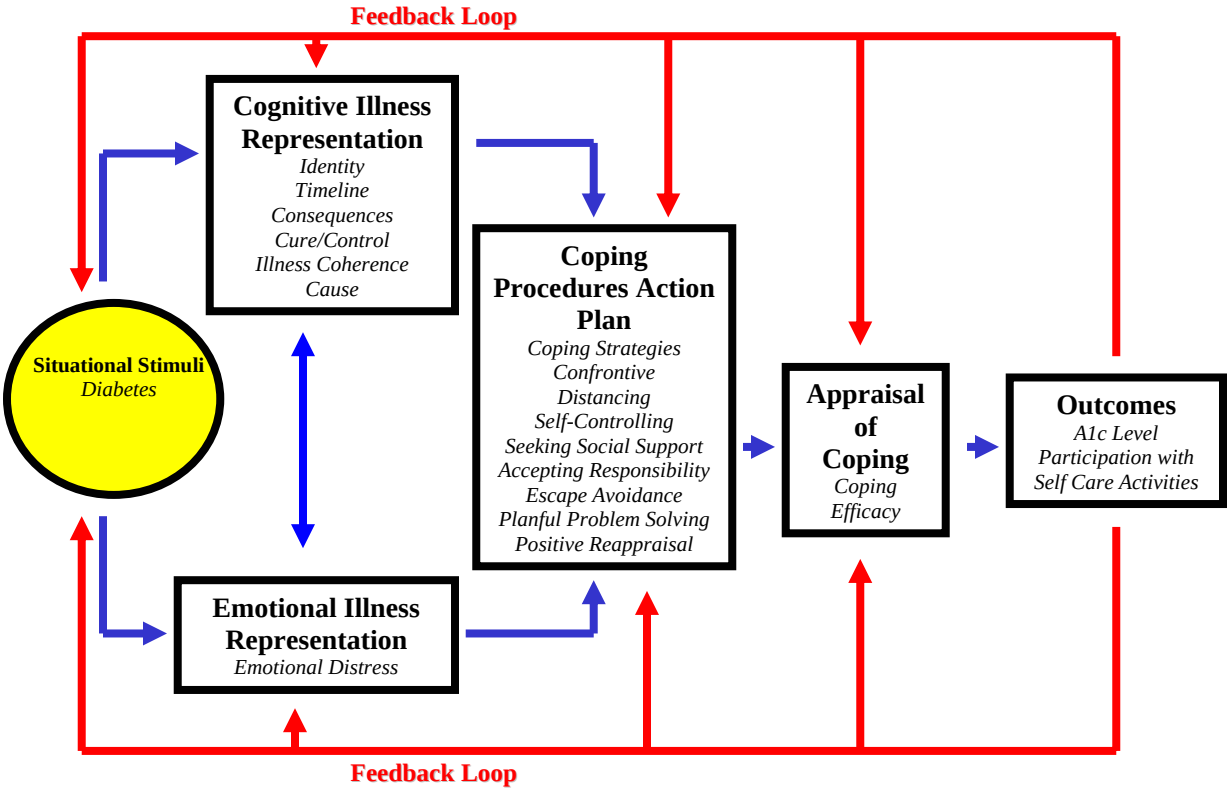

Figure 2. Investigator's Model of Self-Regulation

Theoretical Assumptions

For the purpose of this study, the researcher acknowledged the following assumptions:

1. Diabetes is a chronic illness that creates multiple demands on individuals such as following a prescribed diet, monitoring blood sugar levels, exercising, and taking medications.
2. People are problem-solvers and have the capacity to take control of their own health.

3. Psychosocial stress can influence health outcomes of individuals.
4. Diabetes is a life-long illness that impacts all aspects of an individual's life.
5. Individuals with diabetes will openly share their experiences of living with their disease.
6. Individuals with diabetes have important information to share with nurses and other healthcare providers which will enlighten approaches to improve holistic care.

Rationale for Using Theory

The self-regulation theory by Leventhal et al. (1980) provided a framework to understand factors that influence how people perceive threats of illness and how their beliefs influenced their decisions in self-regulation behavior and health outcomes. Leventhal's self-regulation theory was an appropriate theory to examine illness representations, emotional distress, coping strategies, and coping efficacy of individuals with type 2 diabetes. The concepts and theoretical relationships proposed in Leventhal's theory have been tested over the years. This theoretical framework assisted in understanding the influences of selected psychosocial factors (illness representations, emotional distress, coping strategies, and coping efficacy) on decision-making of individuals to perform self-regulation behavior and the impact on glycemic control. The results of this study may help healthcare providers identify strategies to help motivate individuals to take responsibility for their diabetes and make informed decisions about choices in self-regulation activities. Motivating individuals to perform self-regulating

activities will significantly reduce acute and chronic complications of diabetes, leading to an improved quality of life.

Although Leventhal's self-regulation theory has been used as the framework for numerous studies, most studies have only focused on the cognitive component of the theory. No studies were found that explored the cognitive and emotional components along with the coping effort component of the theory. No studies were found that examined the outcome variables of self-care behavior and A1c levels with the cognitive, emotional, and coping effort components of the theory. By addressing these variables, this study provided additional information about the utility of the theory.

The author chose Leventhal's self-regulation theory because of its' usefulness in examining the influence of selected psychosocial factors in a complex, chronic disease such as diabetes mellitus. The theory is complex but is easily understood. The theory provided an appropriate theoretical framework to explore psychosocial factors that influence self-care behavior and glycemic control in individuals with type 2 diabetes.

Limitations of Theory

Jackson, MacKenzie, and Hobfoll (2000) argue that self-regulation theories such as Leventhal's are too individualistic. They propose that self-regulation theories ignore the social context of an individual's environment such as family, organizations, and groups. This limited scope emphasizes self-contained individualism and the perception of a distinct boundary between the

individual and others. They recommend a “self–in-social-setting-regulation” approach that encompasses the social network of the individual into the theory.

Another limitation of this theory is that it reduces and limits the phenomena under study to the instruments and questions that are asked of the participants. This research approach only focuses on a small part of the human experience of living with type 2 diabetes and therefore provides a narrow focus of the phenomena under study. Human beings are complex and diverse and quantitative research tends to be inflexible and provides a “sedimented view of the world that does not fully capture the reality of human experience” (Polit & Beck, 2004, p. 16).

Since this theory is a cognitive processing theory, utilization is limited to individuals with intact cognitive functions. This theory would not be appropriate in cognitively impaired individuals such as those with severe head injury or Alzheimer’s.

Conceptual Definitions

The six variables investigated in this study were illness representations, emotional distress, coping strategies, coping efficacy, metabolic control, and participation with self-care activities. These were conceptually defined as follows:

1. Illness representations are the perceptions of the illness threat to health based on body sensations or symptoms.
2. Emotional distress is the psychological impact or degree of psychological stress one feels in dealing with the daily demands of an illness or disease.

3. Coping strategies are cognitive and behavioral efforts that are used by individuals to control, reduce, and tolerate stressors (Lazarus & Folkman, 1984).
4. Coping efficacy is the belief that an individual has dealt effectively with stressors in the past and can deal effectively with stressors in the future.
5. Metabolic control is the participant's A1c level within the past 30 days.
6. Self-care behavior is the self-regulation activities (prescribed diet regimen, monitoring blood glucose levels, exercising, foot care, medication, and smoking) individuals perform daily to manage their diabetes.

Summary

The purpose of this study was to examine the relationship between illness representations, emotional distress, coping strategies, and coping efficacy as predictors of outcomes (self-care behavior and glycosylated hemoglobin) in individuals with type 2 diabetes. This study was based on the theoretical framework of Leventhal's self-regulation theory (Leventhal et al., 1980; Leventhal et al., 1984).

CHAPTER II

REVIEW OF LITERATURE

This chapter provides a review of the literature on the following concepts: self-regulation behavior, glycemic control, illness representations, emotional distress, coping strategies, and coping efficacy. The literature review focuses on what is known about each of these concepts in relation to diabetes and concludes with a summary of findings.

Self-Regulation Behavior

Self-regulation is defined as “a systematic process involving conscious efforts to modulate thoughts, emotions, and behaviors in order to achieve goals within a changing environment” (Zeidner, Boekaerts, & Pintrich, 2000, p. 750). Adherence to diabetes self-regulation activities is essential in the prevention and delay of diabetes related complications. Findings from previous studies related to self-regulation and adherence vary widely. Hentinen’s (1987) review of literature concluded that adherence rates varied from 30% to 80% depending on the type of intervention and research methodology used. Several studies have found that people with diabetes have a more difficult time adhering to diet and exercise regimens than to insulin medication administration (Glasgow, McCaul, & Schaffer, 1997; Hentinen & Kyngas, 1992; Ruggiero et al., 1997; Toljamo & Hentinen, 2001). Barriers to medication adherence include complexity of the medication regimen, forgetting to take medication, financial burden, and

not understanding the rationale for specific medication regimens (Browne, Avery, Turner, Kerr, & Cavan, 2000; Dunning & Manias, 2005; Nagelkerk, Reick, & Meengs, 2006).

Conflicting research findings related to self-monitoring of blood glucose are documented. Peveler, Davies, Mayou, Fairburn, and Mann (1993) found that individuals with diabetes regularly adhered to blood glucose monitoring while in contrast, Richmond (1993) and Evans et al. (1999) found that individuals did not monitor their blood glucose levels on a regular basis. Barriers to glucose monitoring have been identified as pain, time constraints, financial burden, lack of skills in performing the task, and lack of knowledge related to interpreting the results (Adams et al., 2005; Karter, Ferrara, Darbinian, Ackerson, & Selby, 2000; Vincze, Barner, & Lopez, 2004). Better adherence to glucose monitoring has been linked to the use of a blood glucose monitoring diary (Moreland et al., 2006).

Swift, Armstrong, Beerman, Campbell, and Pond-Smith (1997) found that a barrier to diet adherence was the feeling of lack of control when individuals were in social situations. Individuals' feelings of pressure to accommodate others in social situations lead to diet adherence issues (Schlundt, Rea, Kline, & Pichert, 1994; Wong, Gucciardi, Li, & Grace, 2005). Nagelkerk et al. (2006) found lack of knowledge and understanding of the importance of a tailored diet regimen were predominant barriers to diet adherence. Eating in response to negative emotions, resisting temptation, and lack of support from family and friends has been linked to poor diet adherence (Schlundt et al., 1994). Vijan et al. (2004) found that

barriers to following dietary recommendations in individuals with type 2 diabetes included cost, small portion sizes, support and family issues, and quality of life issues. Additionally, Meetoo (2004) found that diet-related health actions were influenced by individual differences, social and cultural differences, and the nature and experience of living with diabetes. The researcher found that individuals who perceived a sense of control and acceptance of their diabetes were more compliant with dietary self-care behavior.

Researchers have identified that exercise non-adherence is linked to factors such as time and convenience (Glasgow et al., 1997; Swift, Armstrong, Beerman, Campbell, & Pond-Smith, 1995), fear of complications and discomfort (Swift et al., 1995), and feelings of futility (Glasgow et al., 1997). Environmental factors such as weather condition affects whether an individual will continue with an exercise program (Swift et al., 1995).

The role of social support in diabetes has demonstrated varying results. Studies have linked social support to higher health status levels (Wierenga, 1994; Wilson & Pratt, 1987), better compliance with treatment regimen (MacLean & Lo, 1998; Whittemore, Melkus, & Grey, 2005), adherence to self-care activities (Wang & Fenske, 1996; Whittemore et al., 2005), increased health related quality of life (Aalto, Uutela, & Aro, 1997), and improved psychosocial adaptation (Fisher, Lagreca, Creco, Arfken, & Schneiderman, 1997; Karlsen, Idsoe, Hanestad, Murberg, & Bru, 2004; White et al., 1992; Whittemore et al., 2005). Non-supportive family behavior can result in poorer regimen adherence for glucose testing, insulin injection, and dietary adherence in adolescents and

adults (Schafer, McCaul, & Glasgow, 1986). Persons with diabetes did not accept offers of help positively when the help was perceived to be more than the person desired (Connell, 1991). Bailey and Kahn (1993) found satisfaction and acceptability of spousal help was based on the perception of the motivation of the spouse offering assistance. The support recipient accepted assistance if the assistance was viewed as coming from a caring and concerned perspective. Marital quality and intimacy have been linked to better dietary and exercise self-care behavior as well as better adherence to following physician recommendations (Trief, Ploutz-Snyder, Britton, & Weinstock, 2004).

Empowerment centers on self-awareness, personal responsibility, informed choices, and quality of life. Several studies have explored the concept of empowerment in individuals with diabetes (Anderson et al., 1995; Anderson et al., 2005; DeCoster & George, 2005, Greenfield, Kaplan, Ware, Yano, & Frank, 1988; Kyngas, Hentinen, & Barlow, 1998; Pibernik-Okanovic, Prasek, Poljicanin-Filipovic, Pavlic-Renar, & Meteklo, 2004; Rost, 1989; Street et al., 1993; Williams, Freedman, & Deci, 1998). Studies have supported that empowerment focused education programs were linked to significant improvements in diabetes self-efficacy, self-care behaviors, and reduction in A1c levels (Anderson et al., 1995; Anderson et al, 2005; DeCoster & George, 2005; & Pibernick-Okanovic et al., 2004). Greenfield et al. (1988) found individuals who were encouraged to use their medical information to negotiate medical decisions about their care showed significant improvement in glycosylated hemoglobin levels and self-care behavior. A strong relationship between an individual’s participation and

expression of their views has been linked to better adherence to self-care activities (Rost, 1989). Interactions with nurses who were controlling and directive in their communication resulted in poorer metabolic control (Street et al., 1993). Kyngas et al. (1998) found adolescents' perceptions of their health care professional greatly impacted compliance to the treatment regimen. In this study, health care professionals, who were described as motivating, empowered the adolescents to have better compliance and better metabolic control. Williams et al. (1998) demonstrated that when the health care climate is seen as abounding with provision of choice, information about the problem, acknowledgement of individuals' emotions, and minimal pressure to behave in a particular way, individuals exhibited improved physiological outcomes. Individuals who experienced a more autonomous supportive health care climate reported more autonomous motivation to perform self-care behavior. Nagelkerk et al. (2006) identified lack of information and a poorly developed plan of care from healthcare providers were barriers to self-management behavior.

Glycemic Control

Glycemic control can be assessed by glycosylated hemoglobin levels. Glycosylated hemoglobin levels also known as A1c levels indicate individuals' blood glucose control over the preceding 2 to 3 months. Glycosylated hemoglobin is formed when glucose in the blood binds irreversibly to the hemoglobin in the blood. The American Diabetes Association defines glycemic control as an A1c level below 7% (ADA, 2006).

Brown and Hedges (1994) concluded there was a positive relationship between perceived social support and improved metabolic control. In contrast, Murphy, Williamson, and Nease (1994) found no relationship between the presence or absence of a family health monitor or a helper and the level of metabolic control as measured by glycosylated hemoglobin levels. Toljamo and Hentinen (2001) found that individuals who were adherent to self-care activities had better metabolic control than those who neglected self-care activities. They also found that poor metabolic control, smoking, and living alone were associated with neglect of self-care activities. Higher A1c levels have been associated with younger age, more days with a high fat diet, lower general education, higher number of diabetes complications, increased concerns about medications, and increased barriers to diet and exercise (Aburuz, McElnay, Millership, Andrews, & Smyth, 2002). Nichols, Hillier, Javor, and Brown (2000) identified younger age, lower body mass index (BMI), and increased emotional distress about diabetes were significant predictors of poor glycemic control. Metsch, Tillil, Kobberling, and Sartory (1995) found individuals who frequently checked their blood glucose levels had significantly lower A1c levels compared to those who did not.

Several studies have shown a strong correlation between diabetes self-efficacy and A1c levels (Aikens, Wallander, Bell, & Cole, 1992; Schafer, Glasgow, McCaul, & Dreher, 1983; Wilson et al., 1986). In contrast, other studies have not found a correlation between self-efficacy and A1c levels (Glasgow et al., 1989; Glasgow et al., 1987; Polly, 1992). Ludlow and Gein (1995) found individuals with higher levels of diabetes self-efficacy engaged in more self-care

behavior resulting in lower A1c levels. Grossman, Brink, and Hauser (1987) reported that a higher level of diabetes self-efficacy was associated with better glycemic control.

Ismali, Winkley, and Rabe-Hesketh (2004) conducted a systematic review and meta-analysis of randomized controlled trials of psychological interventions to improve glycemic control in patients with type 2 diabetes. The researchers found that A1c levels were lower in individuals who participated in a psychological intervention than those in control groups in 12 out of 25 trials reviewed.

Illness (Cognitive) Representations

Meyer, Leventhal, and Gutmann (1985) demonstrated that illness (cognitive) representations impact individuals' health related behavior. Illness representations include ideas that individuals have about their illness. An illness (cognitive) representation has five dimensions as core components: (a) identity, (b) cause, (c) timeline, (d) consequences, and (e) curability or controllability. Identity refers to the label given to the illness and the symptoms that are experienced. Cause refers to the individual's belief about the origin of the illness, whether it is biological or psychological. Timeline refers to the individual's belief about how long the illness will last depending on whether it is acute or chronic. Consequences refer to the individual's perception of the long-term or short-term effects of the illness on their life. Curability and controllability refer to the individual's belief about the extent that one can cure or control the illness and

whether their illness outcomes are controllable either by themselves or with the help of others (Leventhal et al., 1980; Leventhal et al., 1984).

Two studies concluded that the accuracy of symptom beliefs was related to metabolic control in type 2 diabetes (Hamera, Cassmeyer, O'Connell, Weldon, & Knapp, 1988; O'Connell et al., 1984). Individuals labeled their symptoms as either hyperglycemic or hypoglycemic episodes and took actions such as monitoring their blood glucose to control their blood glucose levels. Meyer et al. (1985) found that hypertensive individuals used illness representations to monitor blood pressure and that they took health related actions based on blood pressure results. Bishop, Briede, Cavazos, Grotzinger, and McMahon (1987) demonstrated that identity and cause were the two most prominent components of an individual's illness representation, followed by consequences and timeline. Lau, Bernard, and Hartman (1989) found that individuals who hold strong identity beliefs (more symptomatology) and cure beliefs were more likely to seek care. Hampson, Glasgow, and Zeiss (1996) found that differences in illness cognitions were related to levels of self-management in individuals with osteoarthritis.

A few studies have demonstrated that consequences and timeline constructs were predictive of adherence to dietary restrictions and to levels of physical activities in individuals with non-insulin dependent diabetes (Hampson, Glasgow, & Foster, 1995; Hampson, Glasgow, & Toobert, 1990). Timeline was significantly correlated with return to work and a belief that the illness would last a short period of time (Petrie, Weinman, Sharpe, & Buckley, 1996). Perceived control beliefs, a lower illness identity, and perceived beliefs of fewer

consequences were significantly correlated with higher self-efficacy expectancies (Griva et al., 2000). O'Neill (2002) demonstrated that women with chronic obstructive pulmonary disease (COPD) had strong representations of cause and consequences for their role in the disease process. Higher perceived consequences and a stronger illness identity were identified as significant predictors of higher levels of depressive symptomatology in adolescents with type 1 diabetes (Edgar & Skinner, 2003).

Petrie et al. (1996) demonstrated that attendance in rehabilitation of individuals with myocardial infarction was strongly related to the beliefs that the illness could be cured or controlled. A study examining the association between delay in seeking care for breast symptoms and illness representations of Vietnamese women diagnosed with operable breast cancer found beliefs about control and curability of breast cancer were associated with less delay in seeking care (Baumann et al., 1997). Glasgow et al. (1997) and Hampson et al. (1995) found control beliefs were predictive of higher levels of self-management behavior such as diet, exercise, and self-monitoring of blood glucose. Additionally, Watkins et al. (2000) found that individuals who had higher levels of diabetes knowledge (illness coherence) and perceived control beliefs were significant predictors of higher levels of participation in self-care behavior. Beliefs about treatment effectiveness are associated with better compliance of dietary and blood glucose monitoring self-care behavior (Skinner & Hampson, 1998). The aggregate findings from these studies highlight the significance of illness representations in health related behavior.

Emotional Distress

Diabetes is a chronic condition that greatly impacts the psychological well-being of individuals because of symptoms and treatment burdens and the debilitating and sometimes life threatening complications that can occur (Jacobson, de Groot, & Samson, 1994; Lloyd, Dyer, & Barnett, 2000). Treatment and self-management behavior for effective diabetes control demands significant changes in lifestyle patterns including diet and exercise, frequent monitoring of blood glucose, and the potential use of oral or insulin medications. Several studies have reported higher levels of psychological distress such as depression and anxiety among individuals with diabetes compared to those without diabetes (Grisby et al., 2002; Karlsen & Bru, 2002; Lloyd et al., 2000; Metsch et al., 1995; Roy & Roy, 2001; Thomas et al., 2003). Gavard, Lustman, and Clouse (1993) conducted a literature review which supported that depression among adults with diabetes in the United States was three times more prevalent than in the general population. In a similar study, Peyrot and Rubin (1997) found depression and anxiety rates were four to five times higher in diabetic populations than the general population.

Numerous studies suggested that poor psychological well-being of individuals with diabetes is related to an increased incidence of complications from diabetes (Haire-Joshu, Heady, Thomas, Schechtman, & Fisher, 1994; Karlsen & Agardh, 1997; Peyrot & Rubin 1997; Roy & Roy, 2001). Inversely, long-term complications resulting in permanent disabilities may negatively affect the psychological well-being of individuals with diabetes (Eiser, Riazi, Eiser,

Hammersley, & Tooke, 2001). The relationship of age to psychological distress is not clear from previous studies. Some studies support higher rates of psychological distress among younger and middle-aged individuals (Peyrot & Rubin, 1997; Karlsen & Bru, 2002) but lower rates among older individuals (Connell, Davis, Gallant, & Sharpe, 1994; Haire-Joshu et al., 1994). Women with diabetes tend to report higher levels of depression than men, however similar gender differences are found among the general population (Lloyd et al., 2000). Fear and worry about severe hypoglycemic episodes has been linked to anxiety and depression (Gold et al., 1994; Gonder-Frederick, Clarke, & Cox, 1997).

Coping Strategies

Lazarus and Folkman (1984) defined coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). Coping strategies are cognitive and behavioral efforts utilized by individuals to control, reduce, and tolerate stressors (Lazarus & Folkman). Coping strategies are divided into problem-focused and emotion-focused strategies. Problem-focused strategies help manage or alter the person or environment causing the distress. Emotion-focused strategies involve regulating emotions and feelings and utilizing techniques such as distancing, self-control, escape-avoidance, and accepting responsibility (Lazarus & Folkman).

Several studies supported that improved metabolic control, more favorable adjustment, and better emotional status in persons with diabetes have been associated with problem-focused and cognitive coping strategies (Gafvels &

Wandell, 2005; Lundman & Norberg, 1993; Maes, Leventhal, & De Ridder, 1996; Penckofer, Jalowiec, Fink, & Hutson-Danekas, 1991; Rose, Fliege, Hildebrandt, Schirop, & Klapp, 2002; Spiess et al., 1994). Inversely, poor adjustment and adherence, low self-esteem, negative affect, loneliness, and lower quality of life were generally associated with avoidance and emotion-focused coping strategies (Bombadier, D'Amico, & Jordan, 1990; Perry, 1990; Peyrot et al., 1999; Sherbourne, Hays, Ordway, & DiMatteo, 1992; Weijman et al., 2005; White et al., 1992). Smari and Vaitysdottir (1997) found better adjustment when problem-focused coping strategies were used, whereas emotion-oriented coping strategies were related to higher levels of anxiety and depression, lower perceived disease control, and higher blood glucose levels. Karlsen and Bru (2002) examined coping styles among adults with type 1 and type 2 diabetes. Persons with type 1 diabetes reported lower problem-focused coping strategies such as seeking social support, seeking knowledge, and planning compared to persons with type 2 diabetes. In contrast, Peyrot & McMurray (1992) identified two emotion-oriented coping styles (stoicism and anger) that had stronger protective effects against chronic stress and improved glycemic control.

Coping Efficacy

Several theories of adaptation to stress use the concept of coping appraisal which is also known as coping efficacy (Bandura, 1997; Lazarus & Folkman, 1984; Skinner & Wellborn, 1994). Lazarus and Folkman conceptualized cognitive appraisal as the process with which an individual evaluates whether a specific encounter with the environment is relevant to their well-being and in what

ways. There are two components of cognitive appraisal. In primary appraisal, the individual assesses whether the specific encounter has any importance to the individual. In secondary appraisal, the individual assesses whether anything can be done to overcome or prevent injury. Bandura's social cognitive theory conceptualized coping efficacy as the belief that an individual can implement control strategies over potentially threatening events. These strategies include taking actions that reduce the odds of negative outcomes as well as strategies to control one's thoughts and feelings related to the situation. "Cognitive, motivational, affective, and decisional processes" (Bandura, 1997, p. 115) involved in the construction and enactment of coping efforts is greatly influenced by the perceived coping efficacy of an individual in a stressful situation. Skinner and Wellborn (1994) provided a third perspective on coping efficacy in their motivational theory of stress and coping. Coping efficacy beliefs function as a mechanism that impacts coping strategies by altering how an individual appraises threatening events. Coping efficacy beliefs enhance coping attempts by individuals by targeting problem-solving and planning processes to discover new ways to change the threatening situation.

No studies were found that examined coping efficacy in the diabetes population. Several studies have evaluated coping efficacy and an individual's ability to reduce or control pain (Keefe et al., 2001; Lefebvre et al., 1999; Tsay, Halstead, & McCrone, 2001). Lefebvre et al. (1999) evaluated the relationship of arthritis self-efficacy to daily pain, daily mood, and daily pain coping in individuals with rheumatoid arthritis. Individuals who reported higher levels of self-efficacy

and coping efficacy were found to have higher daily ratings of ability to control and decrease pain. Keefe et al. (2001) evaluated the role of daily spirituality, daily religious and spiritual coping in 25 individuals with rheumatoid arthritis. Coping efficacy was significantly related to pain, mood, and social support. On days where individuals could control pain by utilizing spiritual and religious coping methods, they were able to reduce or decrease their joint pain. On days where the individuals reported higher coping efficacy levels, they also reported a more positive mood and higher levels of emotional and social support. Tsay et al. (2001) found that coping efficacy was predicted by perceived higher levels of controllability over stressors, satisfaction with social support, problem focused coping methods, and wishful thinking coping in individuals experiencing post-traumatic stress syndrome.

Two studies have been conducted on coping efficacy in older adults (Aldwin et al., 1996; Gignac et al., 2000). Aldwin et al. evaluated age differences in stress, coping, and appraisal in men. Findings supported that older men felt as effective in dealing with present problems, as well as dealing with future problems, as middle-aged men. Gignac et al. found that individuals with chronic illness who perceived their independence had been affected or who felt dependent on others reported more feelings of helplessness, emotional reactivity, and lower levels of coping efficacy.

Depression has been linked to lower levels of coping efficacy (Gunthert, Cohen, & Armeli, 2002). Gunthert et al. discovered that individuals who had a

higher confidence in their coping ability had a higher positive affect than individuals with lower confidence levels.

Summary of Literature Review

Self-regulation. Studies have found that adherence rates to diabetes self-regulation behavior vary from 30% to 80%. Individuals with diabetes have more difficulty adhering to diet and exercise regimens than they do with medication administration regimens. Poor diet adherence is linked to negative emotions, resisting temptation, lack of support from family and friends, and pressure from social situations. Time, convenience, fear of complications and discomfort, feelings of futility, and environmental factors are linked to exercise non-adherence. Complexity of the medication regimen, forgetting to take medication, financial burden, and not understanding the rationale for specific medication regimens are barriers to medication adherence. Controversy exists whether individuals with diabetes monitor their blood glucose levels on a regular basis or not. Positive social support results in higher levels of health status and improved compliance to self-regulating behavior, quality of life, and psychosocial adaptation. Negative social support results in poorer adherence to glucose testing, medication administration, and diet. Individuals who participate in medical decision-making in a more autonomous supportive health care climate are more motivated to perform self-regulating activities.

Glycemic control. Controversial findings exist whether social support has a positive effect on metabolic control. Higher A1c levels are associated with younger age, higher fat diet, lower education level, higher number of diabetes

complications, increased barriers to diet and exercise, increased medication concerns, and emotional distress. A higher level of diabetes self-efficacy is associated with lower A1c levels.

Illness (Cognitive) representations. Better metabolic control in type 2 diabetes is associated with accurate symptom beliefs. Individuals who are able to identify hypoglycemic or hyperglycemic symptoms are able to take actions to maintain their blood glucose levels within adequate ranges. Perceived serious consequences and a stronger illness identity are significant predictors of higher levels of depression. Perceived serious consequence and beliefs that the illness is a chronic condition are predictors of lower levels of diet and exercise adherence. Higher beliefs in personal and treatment control are associated with better adherence to self-regulating behavior such as diet, exercise, and self-monitoring of blood glucose.

Emotional distress. Depression and anxiety levels are higher in individuals with diabetes than individuals without diabetes. Poor psychosocial well-being is associated with an increased incidence of diabetes related complications. Women with diabetes report higher levels of depression than men. Depression is associated with fear and worry about potential occurrences of hypoglycemic episodes.

Coping strategies. Problem-focused coping strategies are linked to improved metabolic control, more favorable adjustment, and better emotional status in individuals with diabetes. Avoidance and emotion-focused coping

strategies are linked to poor adjustments and adherence, low self-esteem, negative effect, loneliness, and lower quality of life.

Coping efficacy. A higher level of coping efficacy is linked to an individual's ability to reduce or control pain, higher levels of satisfaction with social support, better emotional status, and higher levels of controllability of stressors. Lower coping efficacy is associated with feelings of helplessness, emotional reactivity, and higher levels of depression. No studies were found that examined coping efficacy in a diabetes population.

Conclusion

Self-regulation in diabetes requires participation in prescribed treatment regimens as well as making behavioral changes on a daily basis. Psychosocial factors such as illness representations, emotional distress, coping strategies, and coping efficacy may influence self-regulation behavior and A1c level outcomes of individuals with type 2 diabetes. Research is needed to expand the knowledge base in understanding the influences of these selected psychosocial factors on decision-making of individuals to perform self-regulation behavior and glycemic control. Strategies to help motivate individuals to take responsibility for their diabetes and make informed decisions about choices in self-regulation activities need to be identified and explored. Understanding how changes occur in cognitions, emotional distress, coping behavior, and appraisal of coping efforts may provide valuable insight into processes by which psycho-educational interventions can be developed. The proposed next step in development of the science in this area was to conduct research that examined the relationship

between illness representations, emotional distress, coping strategies, and coping efficacy as predictors of outcomes (A1c level and participation with self-regulating activities) for individuals with type 2 diabetes.

CHAPTER III

METHODOLOGY

This chapter describes the methodology that was used to conduct the study. The following sections are included: study design, sample, setting, methods used to protect human subjects, instruments to measure the study variables, data collection procedures, and data analysis plan.

Study Design

A descriptive, correlational design examined the independent variables (illness representations, emotional distress, coping strategies, and coping efficacy) to determine the predictive relationships with the dependent variables (self-care behavior and A1c levels) in individuals with type 2 diabetes as they relate to diabetes self-management.

Sample and Setting

Power analysis. A power analysis (Appendix A) was conducted using the Pass Analysis and Sample Size (PASS) software to estimate sample size to ensure adequate statistical power for hypothesis testing. Based on findings from the previous pilot study (Hart, 2006), the full model predictor variables accounted for 69.6% of the variance in A1c level and 76.3% of the variance in self-care. The amount of unique variance explained by the theoretical variables (illness representations, emotional distress, coping strategies, and coping efficacy) averaged 16%. In a conservative approach consistent with the pilot data, the

power analysis was conducted with 11 independent variables accounting for 50% of the variance and 8 variables accounting for an additional 10% of the variance for a total R^2 of .60. The power analysis indicated a sample size of 100 would achieve a power of .95 with alpha set at .05

Participants were recruited from four endocrinology offices (71%) (Appendix B, C, & D), one internal medicine office (3%) (Appendix E), two medical clinics (5%) (Appendix F & G), and three diabetes education centers (21%) (Appendix H, I, & J). Letters of introduction (Appendix K) were distributed about the study inviting individuals to participate in the study. Inclusion criteria were that participants (a) had been diagnosed with type 2 diabetes for at least 1 year, (b) were able to read and write in English, (c) were 18 years of age or older, and (d) had an A1c level drawn within the past 30 days.

Disclosure. The researcher for this study, two endocrinology offices, two medical clinics, and one diabetes education center were affiliated with the same health system. Staff of the endocrinology offices, medical clinics, and diabetes education center provided direct patient care in an office setting and at two local area hospitals within this health system. The researcher worked in a business office environment and had responsibilities for system-wide nursing projects and magnet certification functions within the health system. The researcher did not interact with the staff of the endocrinology offices, medical clinics, diabetes education center or their patients in normal daily operations.

Instruments

A demographic data questionnaire (Appendix L) and four scales comprised the instruments for this study. Data elements in the demographic data questionnaire included age, gender, ethnic background, annual income level, marital status, educational level, employment status, type of diabetes, number of years diagnosed with diabetes, and family members living in the household.

The Illness Perception Questionnaire - Revised (IPQ-R) measured the participant's illness representations and emotional distress (Moss-Morris, Weinman, Petrie, Horne, Cameron, & Buick, 2002). Coping strategies used by the participant were measured by the revised Ways of Coping Scale (WCQ-R) (Folkman & Lazarus, 1985). Coping efficacy was measured by the Coping Efficacy Scale (CES) (Sandler, Tein, Mehta, Wolchik, & Ayers, 2000). Self-care behaviors were measured by the Summary of Diabetes Self-care Activities (SDSCA) questionnaire (Toobert, Hampson, & Glasgow, 2000). Glycosylated hemoglobin level measured glycemic control. More specific descriptions of the study instruments follow.

IPQ-R. The IPQ-R measured cognitive and emotional representations of illness (Appendix M) (Moss-Morris et al., 2002). The instrument is divided into three sections which consist of nine subscales that have been found to frame an individual's perception of their illness. The nine subscales include (a) illness identity, (b) timeline-acute & chronic, (c) timeline-cyclical, (d) consequences, (e) personal control, (f) treatment control, (g) illness coherence, (h) emotional representations, and (i) causal factors.

The first section consisted of the “illness identity” subscale. This subscale measured symptoms individuals experienced since being diagnosed with their illness and then asked which symptoms they associated with their illness. The IPQ-R consisted of 14 identity items. Moss-Morris et al. (2002) encourages researchers to adapt the symptoms in the “illness identity” subscale to tailor the instrument to the illness and research setting under study. For this study, the illness identity items were replaced by the symptoms and sub-categories listed in the Type 2 Diabetes Checklist (Grootenhuis, Snoek, Heine, and Bouter, 1994). Permission was received by one of the authors to adapt the Type 2 Diabetes Checklist for this study (F. L. Snoek, personal communication, June 12, 2005) (Appendix N). The researcher found these symptoms to more accurately reflect symptoms which would be experienced by individuals with diabetes than the 14 generic items on the IPQ-R.

The initial list of 78 possible physical and psychological symptoms for the Type 2 Diabetes Checklist was identified through a literature review and discussions with experienced diabetologists (Grootenhuis et al., 1994). Face and content validity of the Type 2 Diabetes Checklist were established by sending the list of symptoms to 20 experienced clinicians including diabetologists, general practitioners, and diabetes educators to determine which symptoms occur more frequently in individuals with diabetes than in individuals without diabetes. Thirty-four of the original items were determined to be appropriate by the experienced clinicians. Factor analysis of these 34 symptoms was conducted and resulted in eight sub-categories. These sub-categories were (a) hyperglycemia,

(b) hypoglycemia, (c) psychological-cognitive, (d) psychological-fatigue, (e) cardiovascular, (f) neurological-pain, (g) neurological-sensory, and (h) ophthalmological. Internal consistency with Cronbach alpha coefficients for the sub-categories ranged between 0.76 and 0.95. Test-retest reliability with Pearson product-moment correlation coefficients for the sub-categories ranged between 0.79 and 0.94.

A “yes” and “no” response format was used for the 34 items in this section (Moss-Morris et al., 2002). The sum of the “yes” responses with the symptoms an individual associated with their illness were summed. The actual score of each sub-category was converted to a standardized score. Higher scores indicated a greater identification of symptoms for that sub-category. The total score was also converted to a standardized score. Higher scores indicated a greater identification of symptoms related to their illness overall.

A pilot study (Hart, 2006) was conducted to test the reliability as internal consistency and stability for the adapted and revised IPQ-R illness identity section and the eight identity sub-categories. Cronbach’s alpha coefficient for the total score of the IPQ-R identity section was .91. Cronbach’s alpha coefficients for the IPQ-R eight identity sub categories were: hyperglycemia .70, hypoglycemia .70, psychological-cognitive .60, psychological-fatigue .72, cardiovascular .67, neurological-pain .74, neurological-sensory .82, and ophthalmology .80. Reliability as internal consistency for the adapted and revised IPQ-R illness identity section and the eight identity sub-categories was acceptable.

Test-retest correlation for the IPQ-R illness identity section in the pilot study was .83 (Hart, 2006). Test-retest correlations for the IPQ-R identity sub categories were: hyperglycemia .72, hypoglycemia .71, psychological-cognitive .75, psychological-fatigue .56, cardiovascular .81, neurological-pain .85, neurological-sensory .91, and ophthalmology .85. Reliability as stability for the adapted and revised IPQ-R illness identity section and the eight identity sub-categories was acceptable.

Cronbach's alpha coefficients for the current study were also conducted. Cronbach's alpha coefficients for the IPQ-R eight identity sub categories were: hyperglycemia .71, hypoglycemia .73, psychological-cognitive .65, psychological-fatigue .77, cardiovascular .72, neurological-pain .78, neurological-sensory .85, and ophthalmology .77 (see Table 1).

Table 1

Reliability: IPQ-R Illness Representation Sub-scales, IPQ-R Identity Sub-categories, Ways of Coping Sub-scales, and CES Questionnaire.

	Original Cronbach's alpha	*Current Cronbach's alpha*
Illness Representation Subscales		
Timeline acute/chronic	.89	.88
Consequences	.84	.77
Personal control	.81	.79
Treatment control	.80	.62
Illness coherence	.88	.89
Timeline cyclical	.79	.81
Emotional	.88	.88
Identity	.75	.92
Eight IPQ-R Identity Sub-categories		
Hyperglycemia	.83	.71
Hypoglycemia	.76	.73
Psychological-cognitive	.86	.65
Psychological-fatigue	.93	.77
Cardiovascular	.80	.72
Neurological-pain	.89	.78
Neurological-sensory	.86	.85
Ophthalmology	.91	.77
Ways of Coping Sub-scales		
	.79	.81
Positive reappraisal	.66	.77
Planful problem solving	.76	.77
Seeking social support	.70	.69
Self controlling	.66	.65
Accepting responsibility	.61	.63
Distancing	.72	.84
Escape avoidance	.70	.64
Confrontive coping		
CES Questionnaire	.91	.90

Table 1 continues

Table 1 (Cont).

Reliability: IPQ-R Illness Representation Sub-scales, IPQ-R Identity Sub-categories, Ways of Coping Sub-scales, and CES Questionnaire.			
	Original Inter-Item Correlations	Current Inter-Item Correlations	*Current Cronbach's alpha*
Summary of Diabetes Self-care Activities	average inter-item correlations within the scales were acceptable (M = 0.47) except for specific diet, which was consistently low (r = .07 to .23).	.14 to .88 Specific diet .14	
General diet			.94
Specific diet			.25
Exercise			.86
Blood Glucose			.80
Foot care			.66

The second section of the IPQ-R consisted of the subscales for timeline-acute and chronic, timeline-cyclical, consequences, personal control, treatment control, illness coherence, and emotional representations. The timeline-acute and chronic subscale measured the beliefs about the duration of the illness where timeline-cyclical subscale measured the beliefs about the variability and unpredictability of the illness. The consequences subscale measured the beliefs of short and long-term complications as a result of the illness. The individual's belief about their ability to control or manage their symptoms and illness was measured by the personal control subscale. The treatment control subscale measured the beliefs of the individual about the efficacy of medical treatments in controlling or managing the disease process. The illness coherence subscale measured the individual's understanding or confusion regarding their illness representation about the disease or illness. Emotional distress of the individual was measured by the emotional representation subscale.

The items in each of the subscales were rated by the individual on a 5-point Likert scale from “strongly disagree” (1) to “strongly agree” (5). The total score was summed for each subscale and divided by the number of items to obtain a mean score. Lower scores indicated a belief of shorter illness duration with a predictable course, fewer reported consequences, weaker control and cure beliefs, confusion and puzzlement about the disease, and lower emotional distress. Higher scores indicated a belief in longer illness duration with an unpredictable course, greater number of consequences, stronger control and cure beliefs, greater understanding of the disease, and higher emotional distress related to the disease.

Section three of the IPQ-R was the causal subscale which consisted of 18 attributes relating to the perceived causation of the individual’s illness. The 18 items were constructed such that half represent internal causal factors and half represent external causal factors. The items are rated on a 5-point Likert scale from “strongly disagree” (1) to “strongly agree” (5). The items were not summed in this subscale since each item represents a specific causal belief. A higher score rating indicated a stronger belief in a specific cause for the illness.

Reliability for the IPQ-R was established by Moss-Morris et al. (2002) in a sample consisting of 711 individuals with varying illnesses including asthma, diabetes, rheumatoid arthritis, chronic pain, acute pain, myocardial infarction, multiple sclerosis, and human immunodeficiency virus. The illness identity subscale Cronbach’s alpha was .75. The remaining Cronbach alphas were timeline-acute and chronic .89, timeline-cyclical .79, consequences .84, personal

control .81, treatment control .80, illness coherence .87, and emotional representations .88. Test-retest reliability was conducted on a sample of renal dialysis inpatients over a 3-week period of time. Pearson's correlations ranged from .46 to .88 with personal control as the only subscale showing a correlation less than 0.5. A 6 month test-retest reliability was conducted on a sample of rheumatoid arthritis individuals. Pearson's correlations ranged from .35 to .82 with timeline cyclical showing a correlation of less than 0.5 (Moss-Morris et al., 2002). Known group validity and predictive validity has been established with the IPQ-R (Moss-Morris et al., 2002). For the current study, Cronbach alphas were illness identity .92, timeline-acute & chronic .88, timeline-cyclical .81, consequences .77, personal control .79, treatment control .62, illness coherence .89, and emotional representations .88 (see Table 1).

WCQ-R. The WCQ-R (Appendix O) is a 66 item instrument used to measure coping modes or strategies of individuals dealing with stressful events or encounters in their lives (Folkman & Lazarus, 1985). The WCQ-R consisted of eight scales or coping strategies: confrontive coping, distancing, self-controlling, seeking social support, accepting responsibility, escape-avoidance, planful problem solving, and positive reappraisal.

The respondents were asked to recall a stressful situation in the past week related to their diabetes. A stressful situation was defined as one that is difficult or troubling, either because individuals feel distressed or must use considerable effort to cope with the situation. Sample items were "I got professional help" and "Found new faith." A 4-point Likert scale was used to rate

how they coped with this stressful situation indicating the frequency with which each strategy was used. The answers were scored as follows: “does not apply or not used” (0), “used somewhat” (1), “used quite a bit” (2), and “used a great deal” (3). The actual score of the coping strategies categories were converted to standardized scores by dividing the maximum score of each category and multiplying by 10 resulting in standardized scores ranging between 0 and 30. Higher scores indicated a greater use of the coping strategy.

The internal consistency of the WCQ-R is based upon factor analysis of the responses of 75 married couples interviewed once a month for 5 months equaling 750 observations. The alpha coefficients of the scales were confrontive coping .70, distancing .61, self-controlling .70, seeking social support .76, accepting responsibility .66, escape-avoidance .72, planful problem-solving .66, and positive reappraisal .79 (Folkman & Lazarus, 1985). For the current study, Cronbach’s alpha coefficients were confrontive coping .64, distancing .63, self-controlling .69, seeking social support .77, accepting responsibility .65, escape-avoidance .84, planful problem-solving .77, and positive reappraisal .81 (see Table 1).

CES. The CES (Appendix P) was developed by Sandler et al. (2000) to measure children’s satisfaction with handling problems in the past and their anticipated effectiveness in handling problems in the future. A confirmatory analysis was conducted that supported the one-dimensional structure of the scale. Test-retest reliability was acceptable (.75) and internal consistency ranged

from .82 to .91 in three different samples of adolescents. This instrument has not been tested in an adult population.

The seven item scale requires responses on a 4-point Likert scale. Four items assessed satisfaction with handling problems in the past and three items assessed ability to handle problems in the future. A sample item was “In the future, how good do you think that you will usually be in handling problems with your diabetes?” The items are summed to achieve a total coping efficacy score. Higher scores reflect higher coping efficacy.

Permission was received by one of the authors to adapt the Coping Efficacy Scale for this study by relating each question to a diabetes illness and adapting it for use in adults (I. Sandler, personal communication, February 24, 2005) (Appendix Q). A pilot study (Hart, 2006) was previously conducted to test reliability as internal consistency and reliability as stability for the adapted and revised CES questionnaire. Cronbach’s alpha coefficient for internal stability of the total score on the adapted and revised CES questionnaire was .90. Test-retest stability correlation for the total score of the adapted and revised CES questionnaire was .76 which was acceptable (Hart, 2006). For the current study, Cronbach’s alpha coefficient for the total score of the CES questionnaire was .90 (see Table 1).

SDSCA. The SDSCA questionnaire (Appendix R) developed by Toobert et al. (2000) measured diabetes self-care behavior of participants. The SDSCA is a brief self-report questionnaire of diabetes self-care management assessing the following aspects of the diabetes regimen: general diet, specific diet, exercise,

blood glucose testing, foot care, medication and smoking. The scale includes 11 core items and also contains an additional 14 optional items for researchers to use. Respondents reported on the frequency with which they have completed these activities over the preceding 7 days. The instrument used an 8-point Likert scale (0-7) which represents the number of days per week. Scores were calculated separately for each of the regimen areas. A total self-care score was calculated for this study to obtain a global view of self-care behavior. A sample item was “On how many of the last 7 days did you test your blood sugar?” The SDSCA assessed personal levels of self-care and did not measure adherence or compliance to the diabetes regimen. The SDSCA is probably the most widely used self-report instrument for measuring diabetes self-management in adults (Toobert et al., 2000).

Reliability coefficients were not reported for this instrument (Toobert et al., 2000). Inter-item correlations were used to assess relationships among items within the scale rather than coefficient alphas because Toobert et al. argued that coefficient alphas are influenced by the number of items in a test as well as the relationship between items. Means for inter-item correlations are general diet (M = 58.6, SD = 28.7, n = 1409); specific diet (M = 67.5, SD = 16.9, n = 973); exercise (M = 34.3, SD = 31.9, n = 883); blood glucose monitoring (M = 69, SD = 34.9, n = 685); medication (*M* = 95, *SD* = 15.4, n = 218); and foot care (M = 47.1, SD = 21, n = 407).

The internal consistency of the scale was assessed by the average inter-item correlations within the scales was acceptable (M = 0.47) except for specific

diet, which was consistently low (r = .07 to .23). Test-retest correlations tended to be moderate with r = 0.40, p < 0.05 for medications to 0.78 for glucose testing. The authors argued that the moderate test-retest reliability correlations may be due to underestimations.

For the current study, internal consistency of the SDSCA questionnaire was assessed by the average inter-item correlations as well as Cronbach's alpha. Average inter-item correlations within the scales were general diet .88, specific diet .14, exercise .76, blood glucose monitoring .66, and foot care .50. Specific diet was extremely low as reported in the original instrument data. Cronbach's alphas were general diet .94, specific diet .25, exercise .86, blood glucose monitoring .80, and foot care .66. Cronbach's alpha for the total instrument was .71 (see Table 1).

Glycosylated hemoglobin level. The participant's A1c level was obtained from the medical record. The A1c level must have been drawn within the past 30 days from the initial contact with the participant by the researcher.

Protection of Human Subjects

The proposal was presented to the Georgia State University Institutional Review Board (Appendix S), Saint Joseph's Hospital Institutional Review Board (Appendix T), and participating agencies' Nursing Research committees (Appendix U & V) to ensure the protection of human subjects. The researcher explained the study in full detail to participants during the initial and follow-up telephone contacts. Written informed consent was to explain the ethical responsibilities of the researcher and rights of participants. IRB approval was

given to provide participants with a $10.00 gift card as partial compensation for their time and effort.

Physician offices and medical clinics access to participants. A letter of introduction (Appendix K) with an enrollment card for the study was given to potential participants as they presented for health care appointments in their physician's office or clinic. The healthcare providers at the office or clinic were asked to distribute the letters. The letters had study information and researcher contact information. Individuals interested in participating in the study completed the enrollment card with their name and telephone number and placed the card in a locked box at the check out desk. The researcher picked up the cards once a week and contacted participants by telephone. Participants could also choose to leave a message on a secure phone message line accessible only to the researcher to obtain information and ask questions about the study. The researcher accessed the message line daily during the data collection phase of the study.

Diabetes education center access to participants. The researcher attended diabetes education classes at the beginning of the classes and provided information about the research study to class participants. A letter of introduction (Appendix K) with an enrollment card for the study was given to potential participants in the class. Individuals interested in participating in the study completed the enrollment cards with their names and telephone numbers and gave the enrollment cards to the researcher or placed the enrollment cards in a locked box at the check out desk. The researcher picked up the enrollment

cards once a week and contacted participants by telephone. Participants could also choose to leave a message on a secure phone message line accessible only to the researcher to obtain information and ask questions about the study. The researcher accessed the message line daily during the data collection phase of the study.

Data Collection Procedures

Participants were contacted by the researcher by telephone from information completed on the enrollment card. After the participants had been informed of the purpose and objective of the study and agreed to participate, the researcher mailed a questionnaire booklet which consisted of the informed consent (Appendix W & X), demographic questionnaire, and study questionnaires. A follow-up phone call was conducted 3 days after the booklet was mailed to explain in detail the informed consent and each section of the booklet. Time for questions and clarification was provided. Each booklet was pre-coded with a number to ensure accuracy and appropriateness of information for each case in the data entry and analysis process. In order to obtain the participant's A1c level from their medical record at their health provider's office, or clinic, the participant's name and date of birth was obtained and was known only to the researcher. The list of names and birthdates was kept in a locked file cabinet at the researcher's home and destroyed once the data collection period and data verification process was complete. Upon completion of the questionnaire booklet, each participant mailed the booklet back to the researcher

in a pre-stamped, self-addressed envelope. A $10.00 gift card from CVS, Eckerd, or Walgreen's Drug store was then mailed to the participant.

All data will be kept in a locked and secure file cabinet for a minimum of 7 years and then destroyed. The data belongs to the researcher and may not be used without permission and ethical review for new applications of the data.

Data Analysis Plan

Data were analyzed with descriptive and inferential statistics using Statistical Package for the Social Sciences (SPSS) for Windows Release 12.0. Statistical methods included frequency, percentage, mean, standard deviation, bivariate correlations, and hierarchical multiple regression.

Demographic data. Descriptive statistics including frequencies, percentages, means, and standard deviations were performed and reported on the following demographic variables: age, gender, ethnic background, annual income level, marital status, educational level, employment status, and number of years diagnosed with diabetes.

Research hypotheses. Descriptive statistics including frequencies, percentages, means, and standard deviations were performed and reported on duration of illness, illness representations, emotional distress, coping strategies, and coping efficacy variables. Descriptive statistics including means and standard deviations were performed and reported to describe the self-care behavior and A1c levels of individuals with type 2 diabetes.

Bivariate correlations were conducted to determine if there were significant relationships between illness representations, emotional distress,

coping strategies, coping efficacy, A1c levels, and self-care activities. Hierarchical multiple regressions were conducted to determine which independent variables (illness representations, emotional distress, coping strategies, and coping efficacy) predicted self-care behavior and A1c levels.

Summary

This chapter described the methodology used to conduct the research study. The following sections were delineated: study design, sample, setting, methods used to protect human subjects, instruments to measure the study variables, data collection procedures, and data analysis plan. Information was provided about a previous pilot study conducted by the researcher to examine reliability as internal consistency and stability for the adapted and revised IPQ-R illness identity section, the eight IPQ-R identity sub-categories, and CES questionnaire. Power analysis considerations were also provided.

CHAPTER IV

RESULTS

The results of this descriptive, correlational study of illness representations, emotional distress, coping strategies, and coping efficacy as predictors of outcomes in type 2 diabetes will be presented in this chapter. A description of the pre analysis data screening procedure, sample, findings from the questionnaires, and hypothesis testing will be reported.

Pre Analysis Data Screening

Pre analysis data screening was conducted prior to statistical analysis. Univariate analysis indicated that the A1c level and timeline-acute/chronic variables were skewed with three participants having values three standard deviations about the mean for A1c levels and four participants having values of three standard deviations below the mean for timeline-acute/chronic. The decision was made to implement the winsorization method (Wilcox, 1998) on the extreme values of the two variables to retain the participants with outlining scores in the study. The three participants with A1c level values three standard deviation above the mean were winsorized by taking the most extreme high A1c value and imputing a value two standard deviations above the mean. Each subsequent extreme value was changed and decreased by 0.1 from this value. The four participants with timeline-acute/chronic values three standard deviations below the mean were winsorized by taking the most extreme low timeline-acute/chronic

value and imputing a value two standard deviations above the mean. Each subsequent extreme value was changed and increased by 0.1 from this value.

Sample Demographics

An initial invitation to participate in the study was extended to 110 individuals who met the entry criteria and agreed to participate in the study after the researcher contacted them by telephone. A total of 82 individuals returned the questionnaire booklet with a signed consent form. This represented a return rate of 75%. Data from 37 additional participants were added to the study from the previous pilot study (Hart, 2006) for a total of 119 participants. Permission was obtained from the pilot study participants via the pilot study consent form to include their data in this larger research study. Table 2 summarizes the frequency distributions for gender, marital status, ethnic background, educational level, employment status, annual income level, living arrangements, and persons living in the home.

Over half of the participants were female (53.8%) while males accounted for 46.2%. Participants ranged in age from 22 to 93 years with a mean age of 56 years (*SD* = 13.90). The majority of the participants were Caucasian (74.8%), with almost one quarter being African American (21%).

Table 2

Sample Demographics. N = 119

	N	*(%)*
Age		
18 – 25	1	(0.8)
26 – 35	5	(4.2)
36 – 45	21	(17.7)
46 – 55	33	(27.7)
56 – 65	28	(23.5)
66 – 75	23	(19.4)
> 75	8	(6.7)
Gender		
Male	55	(46.2)
Female	64	(53.8)
Marital Status		
Single	8	(6.7)
Married	80	(67.2)
Living with a partner	3	(2.5)
Separated	5	(4.2)
Divorced	14	(11.8)
Widowed	9	(7.6)
Ethnic Background		
White/Caucasian	89	(74.8)
Black/African American	25	(21.1)
Hispanic/Latino	0	(0)
Native American	2	(1.7)
Asian or Pacific Islander	1	(0.8)
Arabic	0	(0)
Other	1	(0.8)
Missing	1	(0.8)

Table 2 continues

Table 2 (Cont.)

Sample Demographics. N = 119

	N	*(%)*
Educational Level		
8th Grade or less	2	(1.7)
Some high school	7	(5.9)
High school graduate/GED	18	(15.1)
Some college/Technical School	47	(39.5)
College graduate (Bachelor's Degree)	33	(27.7)
Graduate degree	12	(10.1)
Employment Status		
Working full time, 51 hours or more a week	10	(8.4)
Working full time, 41 hours to 50 hours a week	18	(15.2)
Working full time, 35 hours to 40 hours a week	21	(17.7)
Working part time, less than 35 hours a week	12	(10.1)
Unemployed or laid off and looking for work	1	(0.8)
Unemployed and not looking for work	1	(0.8)
Homemaker	8	(6.7)
In School	1	(0.8)
Retired	34	(28.6)
Disabled, not able to work	13	(10.9)
Income		
Less than $10,000	10	(8.4)
$10,000 to $20,999	12	(10.1)
$21,000 to $30,999	11	(9.3)
$31,000 to $40,999	10	(8.4)
$41,000 to $50,999	7	(5.9)
$51,000 to $70,999	22	(18.5)
$71,000 to $90,999	15	(12.6)
$91,000 to $100,999	6	(5.0)
Above $101,000	20	(16.8)
Missing	6	(5.0)

Table 2 continues

Table 2 (Cont.)

Sample Demographics. N = 119

	N	*(%)*
Living Arrangements		
Home	97	(81.5)
Apartment	16	(13.5)
Assisted living	1	(0.8)
Nursing home	0	(0)
Other	5	(4.2)

	Observed Range	*M*	*(SD)*
Duration of Diabetes in years	1 – 37	9.40	(7.20)
Total # of individuals living in home	0 – 4	1.80	(1.23)
Number of children	0 – 8	2.00	(1.65)
Total # of children living in home	0 – 3	0.51	(0.86)

The majority of the participants were married or living with a partner (69.7%). The duration of diabetes ranged from 1 to 37 years with a mean of 9.40 years (*SD* = 7.20). Sixty-five and half percent reported having type 2 diabetes for ten years or less, 28.6% for 11 to 20 years, 4.2% for 21 to 30 years, and 1.7% for 31 to 37 years. Over one-third of the participants (39.5%) reported attending some college or technical school. Additionally, 37.8% reported either a college or graduate education level. Almost half of the participants (41.1%) worked full-time. Over one-fourth (28.6%) of the participants were retired. Annual incomes ranged from less than $10,000 to over $101,000 per year. Slightly less than half (44.2%) had incomes of $50,999 or less and over half (55.8%) had incomes of $51,000 or more.

Descriptive Statistics for Study Variables

Metabolic control. Table 3 shows the mean and standard deviation for A1c levels. A1c levels ranged from 4.7% to 12.5%. Mean A1c level was 7.42% (*SD* = 1.60), indicating on average that participants blood sugar levels were not in good control. The American Diabetes Association defines glycemic control as an A1c level 7% or below.

Self-care activities. Table 3 shows the means and standard deviations for general diet, specific diet, exercise, blood glucose testing, foot care, medication, and total self-care behavior as assessed by the SDSCA questionnaire. Participants reported the most days for self-care behavior in the area of medication (*M* = 6.58, *SD* = 1.28) and the least number of days of self-care behavior in the area of exercise (*M* = 2.66, *SD* = 2.22). Only ten participants acknowledged smoking with a range of 1 to 30 cigarettes consumed per day. Total self-care behavior scores ranged from 6 to 69 with a possible score range from 0 to 71. Mean self-care behavior score was 40.57 (*SD* = 13.20) indicating a moderate participation level in self-care activities.

Table 3

Possible and Observed Ranges, Means, and Standard Deviations for Summary of Self-Care Activities Scores and A1C Levels. N = 119

Variable	Possible Range	*Observed Range*	*M*	*(SD)*
Medication	0 – 7	0 – 7	6.58	(1.28)
Blood glucose testing	0 – 7	0 – 7	5.10	(2.20)
General diet	0 – 7	0 – 7	4.54	(1.87)
Specific diet	0 – 7	0 – 7	4.16	(1.63)
Foot care	0 – 7	0 – 7	3.37	(2.33)
Exercise	0 – 7	0 – 7	2.66	(2.22)
Total self-care Behavior	0 – 71	6 - 69	40.57	(13.20)
A1c level		4.7 - 12.5	7.42	(1.60)
			N	*(%)*
A1c level categories				
4.7 – 5.0			1	(0.8)
5.1 – 6.0			16	(13.5)
6.1 – 7.0			43	(36.1)
7.1 – 8.0			24	(20.2)
8.1 – 9.0			21	(17.6)
9.1 – 10.0			5	(4.2)
10.1 – 11.0			4	(3.4)
> 11.0			5	(4.2)

Illness representations and emotional distress. The IPQ-R measured cognitive and emotional representations of illness. The means and standard deviations of illness representations, symptom sub-categories, and causation are shown in Table 4. Examination of the mean scores for the dimensions of illness representation shows that individuals with type 2 diabetes perceived their diabetes to be a chronic condition (*M* = 24.34, *SD* = 5.21) with negative

consequences (*M* = 22.34, *SD* = 4.40) from their illness. They scored moderately on timeline cyclical (*M* = 12.01, *SD* = 3.57) and identity (*M* = 12.30, *SD* = 8.20) and moderately high on emotional representation (*M* = 18.18, *SD* = 5.42) indicating that their illness has a somewhat cyclical nature with moderate amounts of symptomatology that greatly impacts their emotional status. They scored high on personal control (*M* = 26.07, *SD* = 3.23), treatment control (*M* = 18.97, *SD* = 3.18), and illness coherence (*M* = 17.84, *SD* = 4.51) indicating positive beliefs about the controllability/curability of their illness and a personal understanding of their diabetes condition.

The seven most commonly experienced symptoms perceived by the majority of participants as part of their diabetes were frequent need to urinate (66%), being thirsty (65%), drinking a lot (61%), little get up and go (58%), general feeling of fatigue (57%), increasing fatigue during the course of the day (54%), and feeling sleepy or drowsy (53%). The three highest symptom sub-categories (see Table 4) were hyperglycemia (*M* = 6.00, *SD* = 3.57), psychological-fatigue (*M* = 5.19, *SD* = 3.81), and neurological-sensory (*M* = 4.02, *SD* = 3.66). Participants reported experiencing an average of 12.30 symptoms (*SD* = 8.20) out of the 34 total symptoms.

The most commonly reported agent of causation (see Table 4) was hereditary-it runs in my family (*M* = 4.04, *SD* = 1.12). The next four commonly reported agents of causation were diet or eating habits (*M* = 4.00, *SD* = 1.04), my own behavior (*M* = 3.48, *SD* = 1.33), aging (*M* = 3.27, *SD* = 1.21), and stress or worry (*M* = 3.23, *SD* = 1.22).

Table 4

Possible and Observed Ranges, Means, and Standard Deviations for Illness Representations, Symptom Sub Categories, and Causation Scores. N = 119

Variable	Possible Range	Observed Range	*M*	*(SD)*
Illness Representations				
Identity	0-34	0–34	12.30	(8.20)
Timeline (acute/chronic)	6-30	6–30	24.34	(5.21)
Consequences	6-30	7–30	22.34	(4.40)
Personal control	6-30	17–30	26.07	(3.23)
Treatment control	4-20	12–25	18.97	(3.18)
Illness coherence	5-25	5–25	17.84	(4.51)
Timeline (cyclical)	4-20	4–20	12.01	(3.57)
Emotional representation	6-30	6-30	18.18	(5.42)
Symptom Sub-Categories (Standardized Scores)				
Hyperglycemia	0-10	0-10	6.00	(3.57)
Psychological-fatigue	0-10	0-10	5.19	(3.81)
Neurological-sensory	0-10	0-10	4.02	(3.66)
Hypoglycemia	0-10	0-10	3.67	(3.89)
Psychological-cognitive	0-10	0-10	3.40	(3.24)
Ophthalmological	0-10	0-10	2.72	(3.19)
Neurological-pain	0-10	0-10	2.35	(3.32)
Cardiovascular	0-10	0-10	1.68	(2.75)

Table 4 continues

Table 4 (Cont.)

Possible and Observed Ranges, Means, and Standard Deviations for Illness Representations, Symptom Sub Categories, and Causation Scores. N = 119

Variable	Possible Range	Observed Range	*M*	*(SD)*
Causation				
Hereditary-it runs in my family	1-5	1-5	4.04	(1.12)
Diet or eating habits	1-5	1-5	4.00	(1.04)
My own behavior	1-5	1-5	3.48	(1.33)
Ageing	1-5	1-5	3.27	(1.21)
Stress or worry	1-5	1-5	3.23	(1.22)
Family problems or worries	1-5	1-5	2.66	(1.23)
My emotional state	1-5	1-5	2.60	(1.18)
Overwork	1-5	1-5	2.33	(1.07)
Poor medical care in my past	1-5	1-5	2.29	(1.17)
My mental attitude	1-5	1-5	2.26	(1.09)
Altered immunity	1-5	1-5	2.21	(1.14)
My personality	1-5	1-5	2.09	(1.11)
Chance or bad luck	1-5	1-5	2.08	(1.07)
Alcohol	1-5	1-5	1.87	(1.05)
A germ or virus	1-5	1-5	1.87	(.962)
Smoking	1-5	1-5	1.77	(.982)
Pollution in the environment	1-5	1-5	1.77	(.807)
Accident or injury	1-5	1-5	1.74	(.961)

Coping strategies and coping efficacy. Coping strategies used by participants are reported in Table 5. Coping strategies that showed the greatest use were positive reappraisal (*M* = 14.75, *SD* = 7.26), planful problem solving (*M* = 14.43, *SD* = 6.43), seeking social support (*M* = 13.79, *SD* = 7.01), and self controlling (*M* = 12.20, *SD* = 5.77).

Coping efficacy is also reported in Table 5. The mean coping efficacy score was 12.84 (*SD* = 4.44), indicating that participants perceptions of their coping efficacy were slightly higher than moderate.

Table 5

Possible and Observed Ranges, Means, and Standard Deviations for Coping Strategies and Coping Efficacy Scores. N = 119

Variable	Possible Range	*Observed Range*	*M*	*(SD)*
Coping Strategies				
Positive reappraisal	0 – 30	0 – 30	14.75	(7.26)
Planful problem solving	0 – 30	0 – 28	14.43	(6.43)
Seeking social support	0 – 30	0 – 30	13.79	(7.01)
Self controlling	0 – 30	0 – 29	12.20	(5.77)
Accepting responsibility	0 – 30	0 – 28	10.82	(6.97)
Distancing	0 – 30	0 – 23	10.76	(5.67)
Escape avoidance	0 – 30	0 – 26	9.10	(7.21)
Confrontive coping	0 – 30	0 – 27	8.50	(5.20)
Coping Efficacy	0 – 21	0 – 21	12.84	(4.44)

Relationships Between Illness Representation Variables

Illness representation variables. Matrices depicting correlations among variables are included in Tables 6, 7, 8, and 9. Significant relationships were demonstrated between timeline acute/chronic and three other variables, consequence, treatment control, and emotional distress. Timeline acute/chronic was positively correlated at r (119) = .391, $p < .001$ with consequence and positively correlated at r (119) = .192, $p = .036$ with emotional distress. Timeline acute/chronic was moderately and negatively correlated at r (119) = -.427, $p < .001$ with treatment control scores. Participants who viewed their diabetes illness as chronic in nature perceived more serious consequences from their diabetes, more emotional distress, and lower perceived beliefs about treatment controlling or curing their diabetes.

Table 6

Intercorrelations Between Illness Representations, Coping Strategies, and Coping Efficacy Variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
IPQ Variables																	
1. Identity	1	.017	.424**	-.264**	-.181*	-.329**	.505**	.393**	.228*	.353**	.107	.262**	.488**	-.005	.110	.244**	-.228**
2. Timeline (acute/chronic)		1	.391**	-.055	-.427**	-.008	.026	.192*	-.027	-.167	-.029	-.039	-.016	-.159	-.283**	-.092	-.306**
3. Consequences			1	-.097	-.326**	-.127	.205*	.579**	.222*	.172	.090	.047	.355**	-.055	-.134	.140	-.376**
4. Personal Control				1	.496**	.386**	-.281**	-.188*	-.004	-.047	.230*	-.123	-.135	.224*	.186*	.085	.339**
5. Treatment Control					1	.245**	.059	-.184*	-.038	.090	.091	.046	-.071	.188*	.262	.100	.197*
6. Illness coherence						1	-.388**	-.444**	-.201*	-.415**	.156	-.369**	-.360**	.134	-.047	-.258**	.272**
7. Timeline (cyclical)							1	.376**	.280**	.448**	.000	.411**	.406**	.097	.115	.366**	-.340**
8. Emotional								1	.357**	.318**	.032	.309**	.535**	-.061	.018	.283**	-.447**
Coping Strategies																	
9. Confrontive coping									1	.413**	.194*	.592**	.487**	.384**	.349**	.608**	-.004
10. Distancing										1	-.040	.431**	.592**	.057	.206*	.544**	-.146
11. Seeking social support											1	.074	.068	.440**	.476**	.268**	.322**
12. Accepting responsibility												1	.552**	.344**	.406**	.619**	-.124
13. Escape avoidance													1	-.084	.103	.415**	-.319**
14. Planful problem solving														1	.657**	.542**	.340**
15. Positive reappraisal															1	.540**	.351**
16. Self-controlling																1	.076
Coping Efficacy																	
17. Coping Efficacy																	1

*p<.05. **p<.01

Table 7

Intercorrelations Between Illness Representations, Self-Care Behavior, and A1c Level Variables.

	1	2	3	4	5	6	7	8	9	10
IPQ Variables										
1. Identity	1	.017	.424**	-.264**	-.181*	-.329**	.505**	.393**	-.167	.301**
2. Timeline (acute/chronic)		1	.391**	-.055	-.427**	-.008	.026	.192*	-.205*	-.019
3. Consequences			1	-.097	-.326**	-.127	.205*	.579**	-258**	.253**
4. Personal control				1	.496**	.386**	-.281**	-.188*	.119	.046
5. Treatment control					1	.245**	.059	-.184*	.072	.092
6. Illness coherence						1	-.388**	-.444**	.262**	-.121
7. Timeline (cyclical)							1	.376**	-.227*	.443**
8. Emotional								1	-.278**	.267**
Self-Care Activities										
9. Total Self-Care									1	-.293**
A1c Levels										
10. Alc level										1

*p<.05. **p<.01

Table 8

Intercorrelations Between Coping Efficacy, Self-Care Behavior, and A1c Level Variables.

	1	**2**	**3**
1.Coping Efficacy	1	.550**	-.197**
2. Total Self-Care		1	-.293**
3. A1c level			1

*p<.05. **p<.01

Table 9

Intercorrelations Between Coping Strategies, Self-Care Behavior, and A1c Level Variables.

	1	2	3	4	5	6	7	8	9	10
Coping Strategies										
1. Confrontive coping	1	.413**	.194*	.592**	.487**	.384**	.349**	.608**	-.064	.253**
2. Distancing		1	-.040	.431**	.592**	.057	.206*	.544**	-.119	.195*
3. Seeking social support			1	.074	.068	.440**	.476**	.268**	.280**	-.002
4. Accepting responsibility				1	.552**	.344**	.406**	.619**	-.135	.137
5. Escape avoidance					1	-.084	.103	.415**	-.261**	.259**
6. Planful problem solving						1	.657**	.542**	.242**	.014
7. Positive reappraisal							1	.540**	.205*	-.004
8. Self-controlling								1	.017	.149
Self-Care Activities										
9. Total Self-Care score									1	-.293**
A1c Levels										
10. Alc level										1

*p<.05. **p<.01.

Significant relationships were demonstrated between consequence and four other variables, identity, treatment control, timeline-cyclical, and emotional distress. Consequence was moderately and negatively correlated at r (119) = -.326, $p < .001$ with treatment control. Consequence was positively correlated at r (119) = .205, $p = .025$ with timeline-cyclical, identity at r (119) = .424, $p = .000$, and emotional distress at r (119) = .579, $p < .001$. Perceived serious consequences from diabetes were associated with beliefs that treatment could not control or cure diabetes, a more cyclical disease course in nature, more symptomatology, and higher levels of emotional distress.

Significant relationships were also demonstrated between personal control and five other variables, identity, treatment control, illness coherence, timeline-cyclical, and emotional distress. Personal control was negatively correlated with identity, r (119) = -.264, $p = .004$, emotional distress, r (119) = -.188, $p = .040$, and timeline-cyclical, r (119) = -.281, $p = .002$. Personal control was positively correlated with treatment control, r (119) = .496, $p < .001$, and illness coherence scores, r (119) = .386, $p < .001$. Lower perceived personal control was associated with a stronger illness identity, more emotional distress, and a cyclical disease course in nature. Higher perceived personal control was associated with higher beliefs about treatment control and a greater understanding of diabetes illness.

Significant relationships were demonstrated between illness coherence and four other variables, identity, treatment control, timeline-cyclical, and emotional distress. Illness coherence was negatively correlated with identity,

r (119) = -.329, *p* < .001, timeline-cyclical, *r* (119) = -.388, *p* < .001, and emotional distress, *r* (119) = -.444, *p* < .001. Illness coherence was positively correlated with treatment control, *r* (119) = .245, *p* = .007. A lower understanding of diabetes was associated with more symptomatology, perceptions of a more cyclical disease course, and higher levels of emotional distress. A greater understanding of diabetes was associated with higher levels of perceived treatment control.

Timeline-cyclical was positively correlated with emotional distress, *r* (119) = .376, *p* < .001, and identity, *r* (119) = .505, *p* < .001. Emotional distress was positively correlated with identity, *r* (119) = .393, *p* < .001. Higher levels of emotional distress were associated with more symptomatology and higher perceptions of diabetes as cyclical in nature.

Relationships Between Coping Efficacy, Illness Representations, and Coping Strategy Variables

Coping efficacy and illness representation variables. Table 6 depicts the correlation coefficients between coping efficacy and illness representation variables. Coping efficacy was significantly correlated with all illness representation variables. Significant positive correlations were found between coping efficacy and personal control, *r* (119) = .339, *p* < .001, treatment control, *r* (119) = .197, *p* = .031, and illness coherence, *r* (119) = .272, *p* = .003. Significant negative correlations were found between coping efficacy and illness identity, *r* (119) = -.228, *p* = .013, timeline acute/chronic, *r* (119) = -.306, *p* = .001, consequences, *r* (119) = -.376, *p* < .001, timeline cyclical, *r* (119) = -.340,

$p < .001$, and emotional distress, r (119) = -.447, $p < .001$. Higher coping efficacy was associated with higher levels of perceived personal control, treatment control, and a greater understanding of diabetes. Lower coping efficacy was associated with a stronger illness identity, a more chronic, cyclical disease process with serious consequences, and higher levels of emotional distress.

Coping efficacy and coping strategy variables. Coping efficacy was positively correlated with seeking social support, r (119) = .322, $p < .001$, planful problem-solving, r (119) = .340, $p < .001$, and positive reappraisal, r (119) = .351, $p < .001$ (see Table 6). Coping efficacy was negatively correlated with escape avoidance, r (119) = -.319, $p < .001$. Higher coping efficacy was related to higher levels of social support, problem-focused efforts to address issues with diabetes, and efforts to find positive meaning related to diabetes illness. Lower coping efficacy was associated with behavior efforts to escape or avoid issues related to diabetes illness.

Relationships Between Independent Variables and Self-care Behavior

Self-care and illness representation variables. Table 7 depicts the correlation coefficients between illness representations and self-care behavior. Significant negative relationships were found between self-care behavior and timeline acute/chronic, r (119) = -.205, $p = .025$, consequences, r (119) = -.258, $p = .005$, timeline-cyclical, r (119) = -.227, $p = .013$, and emotional distress, r (119) = -.277, $p = .002$. A significant positive correlation was found between self-care behavior and illness coherence at r (119) = .262, $p = .004$. Higher self-care behavior was associated with perceived beliefs that diabetes was less

chronic and cyclical in nature, lower consequence perceptions, and lower levels of emotional distress. A greater understanding of diabetes was associated with greater engagement in self-care behavior.

Self-care and coping efficacy. Table 8 depicts the correlation coefficients between coping efficacy and self-care behavior. Coping efficacy scores were moderately and positively correlated at r (119) = .550, p < .001 with self-care behavior. Higher coping efficacy was associated with higher levels of self-care behavior.

Self-care and coping strategy variables. Table 9 depicts the correlation coefficients between coping strategies and self-care behavior. Self-Care behavior was positively correlated with seeking social support, r (119) = .280, p = .002, planful problem-solving, r (119) = .242, p = .008, and positive reappraisal, r (119) = .205, p = .026. Self-care behavior was negatively correlated with escape avoidance at r (119) = -.261, p = .004. Higher self-care behavior was associated with a more supportive social environment, use of planful problem-solving techniques, and finding positive meaning in stressful experiences by focusing on personal growth. Lower self-care behavior was associated with escape avoidance coping strategies.

Relationship Between Self-Care and A1c levels

Self-care and A1c level variables. A significant negative correlation was found between self-care behavior and A1c levels, r (119) = -.293, p = .001 (see Table 8). Higher self-care behavior was associated with lower A1c levels.

Relationships Between Independent Variables and A1c levels

A1c levels and illness representation variables. Table 7 depicts the correlation coefficients between illness representations and A1c levels. *S*ignificant positive correlations were found between A1c levels and identity, r (119) = .301, p = .001, consequences, r (119) = .253, p = .005, emotional distress, r (119) = .267, p = .003, and timeline-cyclical r (119) = .443, p < .001. Lower A1c levels were associated with lower illness identity, beliefs that diabetes did not have serious consequences, less emotional distress, and beliefs that diabetes was less cyclical in nature.

A1c levels and coping efficacy. A significant negative correlation was found between A1c levels and coping efficacy, r (119) = -.197, p = .031 (see Table 8). Lower A1c levels were associated with higher coping efficacy.

A1c levels and coping strategy variables. Significant positive relationships were found between A1c levels and three coping strategy variables, confrontive coping, r (119) = .253, p = .005, distancing, r (119) = .195, p = .034, and escape avoidance, r (119) = .259, p = .004 (see Table 9). Lower A1c levels were associated with lower use of confrontive coping to aggressively alter diabetes situations, less distancing or detaching from the situation to minimize the situation, and lower use of behavioral efforts to escape or avoid the situation.

Hypothesis Testing

A series of simultaneous and hierarchical multiple regressions were performed to test the study hypotheses. To make the model more parsimonious only independent variables with a significant univariate correlation with a p value

of .10 or less with the outcome variables were entered into the regression models. The independent variables entered into the regressions with self-care behavior as the outcome included timeline acute/chronic, consequences, illness coherence, timeline-cyclical, emotional distress, identity, seeking social support, escape avoidance, planful problem-solving, positive reappraisal, and coping efficacy. The independent variables entered into the regressions with A1c levels as the outcome included consequences, timeline-cyclical, emotional distress, identity, confrontive coping, distancing, escape avoidance, and coping efficacy. A main hypothesis and three sub-hypotheses were tested for each of the dependent variables (self-care behavior and A1c levels).

Self-care behavior main hypothesis. The main hypothesis for self-care behavior tested whether age, duration of diabetes, illness representations, coping strategies, and coping efficacy accounted for a significant amount of the variance in self-care behavior. Simultaneous multiple regression results indicated that the overall model significantly predicted the dependent variable, self-care behavior, $R^2 = .357$, $R^2_{adj} = .277$, $F\ (13, 118) = 4.485$, $p < .001$. This model accounted for 27% of the variance in the dependent variable, self-care behavior (see Table 10). Review of the β weights specify that only one predictor variable, coping efficacy, $\beta = .405$, $t_{(118)} = 3.774$, $p < .001$ significantly contributed to the model with greater coping efficacy predicting greater self-care behavior.

Table 10

Multiple Linear Regression for Variables Associated with Self-Care Behavior. N = 119

Regression Variable	*B*	*SE B*	β
Demographic Variables			
Age	.131	.088	.137
Duration of Diabetes	-.101	.155	-.055
Illness Representation Variables			
Timeline acute/chronic	-.141	.233	-.056
Consequences	-.293	.343	-.098
Illness coherence	.492	.314	.168
Timeline cyclical	-.046	.376	-.013
Emotional	.235	.299	.097
Identity	.091	.173	.056
Coping Strategies Variables			
Seeking social support	.239	.185	.127
Escape avoidance	-.139	.195	-.076
Planful problem solving	.074	.231	.036
Positive reappraisal	-.064	.216	-.035
Coping Efficacy	1.203	.319	.405**
R^2		0.357	
Adjusted R^2		0.277	
F (*p*-value for model)		4.485 (*p* < .001)	

** p < .05. ** p < .01.*

Self-care behavior sub-hypotheses. Self-care behavior sub-hypotheses tested whether each set of independent variables (illness representations, coping strategies, and coping efficacy) accounted for a significant amount of the unique variance in self-care behavior over and above each of the other sets of independent variables, after controlling for age and duration of diabetes. Age and duration of diabetes were entered at Step 1 in the equation. In Step 3, the set of

independent variables being tested for unique variance were entered into the equation. Step 2 consisted of entering the other two sets of independent variables not being tested for unique variance.

Only the coping efficacy variable (see Table 11) was found to explain a significant amount of unique variance in self-care behavior over and above illness representations and coping strategies, after controlling for age and duration of diabetes. Age and duration of diabetes were entered together at Step 1 of the regression equation and explained 5% of the variance in self-care behavior, $R^2 = .046$, $R^2_{adj} = .029$, F (2, 118) = 2.779, $p = .066$, ns. Thus, age and duration of diabetes were not found to be statistically significant in explaining a significant amount of variance in self-care behavior. Illness representations and coping strategy variables were entered together at Step 2 of the regression equation, and these two sets of variables were found to increase the variance in self-care behavior explained in Step 1 by 22%, $R^2_{change} = .224$, $F_{change\ (12, 118)} = 3.264$, $p < .001$. Hence, illness representations and coping strategies were found to explain a significant amount of the variance in self-care behavior. Finally, coping efficacy was entered in Step 3, and uniquely added 9% in explanatory power over Step 2, $R^2_{change} = .087$, $F_{change\ (13, 118)} = 14.240$, $p < .001$. Therefore, coping efficacy accounted for a significant amount of the unique variance in self-care behavior over and above illness representations and coping strategies, after controlling for age and duration of diabetes. This sub hypothesis was supported. The other two sub hypotheses were not supported.

Table 11

Hierarchical Multiple Regression for Variables Associated with Self-Care Behavior. N = 119

	Model 1			*Model 2*			*Model 3*		
Regression Variable	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Demographic Variables									
Age	.190	.087	.200*	.185	.092	.195*	.131	.088	.137
Duration of Diabetes	-.189	.168	-.103	-.089	.164	-.049	-.101	.155	-.055
Illness Representation Variables									
Timeline acute/chronic				-.300	.243	-.118	-.141	.233	-.056
Consequences				-.426	.362	-.142	-.293	.343	-.098
Illness coherence				.569	.332	.194	.492	.314	.168
Timeline cyclical				-.380	.388	-.103	-.046	.376	-.013
Emotional				.025	.312	.010	.235	.299	.097
Identity				.132	.183	.082	.091	.173	.056
Coping Strategies Variables									
Seeking social support				.388	.191	.206*	.239	.185	.127
Escape avoidance				-.189	.206	-.104	-.139	.195	-.076
Planful problem solving				.177	.243	.086	.074	.231	.036
Positive reappraisal				.046	.227	.025	-.064	.216	-.035
Coping Efficacy							1.203	.319	.405**
$R^2 \triangle$	.046			.224			.087		
R^2	.046			.270			.357		
Adjusted R^2	.029			.187			.277		
F (*p*-value for model)	2.779 ($p = .066$)			3.264 ($p < .001$)			4.485 ($p < .001$)		

** p < .05. ** p < .01.*

A1c level main hypothesis. The main hypothesis for A1c level tested whether age, duration of diabetes, illness representations, coping strategies, and coping efficacy accounted for a significant amount of the variance in A1c levels. Simultaneous multiple regression results indicated that the overall model significantly predicted the dependent variable, A1c level, $R^2 = .279$, $R^2_{adj} = .212$, F (10, 118) = 4.180, $p < .001$ (see Table 12). This model accounted for 21% of the variance in the dependent variable, A1c level. Review of the β weights

specify that one predictor variable, timeline cyclical, β = .398, $t_{(118)}$ = 3.736, *p* = .000, significantly contributed to the model with increasing perceptions of diabetes as cyclical in nature associated with higher A1c levels. Duration of diabetes, β = .172, $t_{(118)}$ = 1.978, *p* = .051, was approaching towards significance with longer duration of diabetes associated with higher A1c levels.

Table 12

Multiple Linear Regression for Variables Associated with A1c Levels. N = 119

Regression Variable	*B*	*SE B*	*β*
Demographic Variables			
Age	-.016	.010	-.143
Duration of Diabetes	.038	.019	.172
Illness Representation Variables			
Consequences	.052	.039	.143
Timeline cyclical	.177	.047	.398**
Emotional	-.017	.036	-.058
Identity	-.001	.021	-.004
Coping Strategies Variables			
Confrontive coping	.045	.031	.146
Distancing	-.024	.030	-.084
Escape avoidance	.003	.028	.013
Coping Efficacy	.000	.036	.001
R^2		.279	
Adjusted R^2		.212	
F (*p*-value for model)		4.180 (*p* < .001)	

** p < .05. ** p < .01.*

A1c level sub-hypotheses. A1c level sub-hypotheses tested whether each set of independent variables (illness representations, coping strategies, and coping efficacy) accounted for a significant amount of the unique variance in A1c

levels over and above each set of other independent variables, after controlling for age and duration of diabetes. Age and duration of diabetes were entered at Step 1 in the equation. In Step 3, the set of independent variables being tested for unique variance were entered into the equation. Step 2 consisted of entering the other sets of independent variables not being tested for unique variance.

Only illness representations (see Table 13) were found to explain a significant amount of unique variance in A1c levels over and above coping strategies and coping efficacy, after controlling for age and duration of diabetes. Age and duration of diabetes were entered together at Step 1 of the regression equation and explained 8% of the variance in A1c level, $R^2 = .081$, $R^2_{adj} = .065$, F (2, 118) = 5.096, $p = .008$. Coping strategies and coping efficacy were entered together at Step 2 of the regression equation, and these two sets of variables were found to increase the variance in A1c level explained in Step 1 by 7.8%, $R^2_{change} = .078$, $F_{change\ (6, 118)} = 3.533$, $p = .003$. Hence, coping strategies and coping efficacy were found to explain a significant amount of the variance in A1c levels. Finally, illness representations were entered together in Step 3, uniquely added 12% in explanatory power over Step 2, $R^2_{change} = .120$, $F_{change\ (10, 118)} = 4.180$, $p < 001$. Therefore, the set of illness representation variables accounted for a significant amount of the unique variance in A1c level over and above coping strategies and coping efficacy, after controlling for age and duration of diabetes. Again, review of the β weights specify that one predictor variable, timeline cyclical, $\beta = .398$, $t_{(118)} = 3.736$, $p < .001$, significantly contributed to the model. Duration of diabetes, $\beta = .172$, $t_{(118)} = 1.978$, $p = .051$, was approaching

towards significance. This sub hypothesis was supported. The other two sub hypotheses were not supported.

Table 13

Hierarchical Multiple Regression for Variables Associated with A1c Levels. N = 119

	Model 1			*Model 2*			*Model 3*		
Regression Variable	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Demographic Variables									
Age	-.025	.010	-.224*	-.018	.011	-.153	-.016	.010	-.143
Duration of Diabetes	.046	.020	.209*	.041	.019	.185*	.038	.019	.172
Coping Strategies Variables									
Confrontive coping				.060	.031	.197	.045	.031	.146
Distancing				.009	.031	.033	-.024	.030	-.084
Escape avoidance				.012	.027	.054	.003	.028	.013
Coping Efficacy				-.046	.034	-.128	.000	.036	.001
Illness Representation Variables									
Consequences							.052	.039	.143
Timeline cyclical							.177	.047	.398**
Emotional							-.017	.036	-.058
Identity							-.001	.021	-.004
$R^2 \triangle$	.081			.078			.120		
R^2	.081			.159			.279		
Adjusted R^2	.065			.114			.212		
F (*p*-value for model)	5.096 (*p* = .008)			3.533 (*p* = .003)			4.180 (*p* < .001)		

** p < .05. ** p < .01.*

Summary

Multifaceted relationships were revealed between illness representations, emotional distress, coping strategies, coping efficacy, A1c levels, and self-care behavior. Coping efficacy was found to explain a unique amount of variance in self-care behavior. Greater coping efficacy predicted greater self-care behavior. Illness representations, specifically timeline-cyclical, were found to explain a

unique amount of variance in A1c levels. Increasing perceptions of diabetes as cyclical in nature predicted higher A1c levels. Perceptions of diabetes as being less chronic were significantly associated with higher self-care behavior. Higher coping efficacy and higher self-care behavior were associated with two problem-focused coping strategies (seeking social support and planful problem-solving) and one emotion-focused coping strategy (positive reappraisal). Higher A1c levels were associated with escape avoidance coping (emotion-focused), confrontive coping (problem-focused), and distancing (emotion-focused). The next chapter will discuss the significance of these findings in greater detail.

CHAPTER V

DISCUSSION

Chapter V presents a discussion of the study results and subsequent conclusions. Results of the hypothesis testing will be discussed. Discussions will also focus on the study findings with respect to relationships among illness representations, emotional distress, coping strategies, coping efficacy, A1c levels, and self-care behavior. The chapter will conclude with a discussion of the limitations of the study and its implications for nursing, healthcare, theory development, and future research. The chapter concludes with a summary of the study.

Hypothesis Testing

Self-care behavior. Multiple regression analysis revealed that the model which included the variables of age, duration of diabetes, illness representations (identity, timeline-acute/chronic, consequences, illness coherence, timeline-cyclical, and emotional distress), coping strategies (seeking social support, escape avoidance, planful problem-solving, and positive reappraisal), and coping efficacy accounted for 27% of the variance in self-care behavior. Coping efficacy was the only predictor variable found to significantly contribute to the model. A hierarchical regression analysis revealed that coping efficacy uniquely accounted for 9% of the variance in self-care behavior over and above illness

representations and coping strategies, after controlling for age and duration of diabetes.

In this study, coping efficacy uniquely contributed to the prediction of self-care behavior. Higher coping efficacy was associated with higher levels of self-care behavior. Individuals who felt they were coping efficaciously performed better self-care behavior. Individuals who perceived that they handled problems with diabetes in the past perceived that they would be able to handle problems with diabetes in the future. A higher perceived level of coping efficacy encourages the use of effective coping strategies used in the past to continue to move the individual further away from threatening health situations in the future. In conjunction, effective coping strategies that have been successful in the past should increase the level of perceived coping efficacy. This is evident in the fact that individuals with higher levels of coping efficacy also held higher beliefs of personal control, treatment control, and a greater understanding of their diabetes illness. In addition, participants exhibiting higher levels of self-care behavior viewed their diabetes as less chronic and cyclical in nature, held beliefs that their diabetes would result in less serious consequences, and experienced lower levels of emotional distress. Individuals who felt they were in control of their diabetes, were more knowledgeable about their disease process, and felt that their diabetes could be controlled by effective treatment regimens held higher coping efficacy beliefs resulting in higher self-care behavior. Higher self-care behavior results in a more controlled disease process that has potentially less

negative impact on individuals such as a less cyclical disease course, fewer negative consequences, and lower emotional distress.

While no studies were found that examined the effects of coping efficacy in a diabetes population, higher levels of coping efficacy have been linked to better emotional status, higher levels of controllability of stressors, and better ability to reduce or control pain in other disease populations (Keefe et al., 2001; Lefebvre et al., 1999; Tsay et al., 2001). The findings from this study on coping efficacy add new information to the literature about the role coping efficacy plays in self-care behavior and diabetes health outcomes such as glycemic control.

A1c levels. Multiple regression analysis revealed that the model which included the variables of age, duration of diabetes, illness representations (identity, consequences, timeline-cyclical, and emotional distress), coping strategies (confrontive coping, distancing, and escape avoidance), and coping efficacy accounted for 21% of the variance in A1c levels. Timeline-cyclical was the only predictor variable found to significantly contribute to the model. A hierarchical regression analysis revealed that illness representations uniquely accounted for 12% of the variance in A1c levels over and above coping strategies and coping efficacy, after controlling for age and duration of diabetes. Timeline-cyclical was the only predictor variable found to significantly contribute to the model. Individuals who perceived their diabetes as having a cyclical disease course had higher A1c levels.

Previous research studies have found predictive relationships between cause, serious consequences, a stronger illness identity, and higher A1c levels

and previous research studies also have found predictive relationships between perceived treatment effectiveness, perceived personal control, and lower A1c levels (Grivia et al., 2000; Hampson et al., 1995; Paschalides et al., 2004). One study found no predictive relationships between illness representations (cause, identity, treatment control, and consequences) and A1c levels (Hampson et al., 1990).

The findings from this study differ from previous research in that timeline-cyclical was predictive of higher A1c levels. This finding may be attributed to individuals who are experiencing acute and chronic complications from their diabetes illness. Individuals in this study experienced an average of 12 diabetes symptoms out of the 34 symptoms listed on the IPQ-R questionnaire. The highest symptom sub-category indicated by participants was hyperglycemia. Higher A1c levels were associated with a stronger illness identity, beliefs in serious diabetes consequences, more emotional distress, and beliefs that diabetes illness course was more cyclical in nature. Participants experiencing higher incidences of hyperglycemic episodes may be more likely to perceive a more cyclical disease process, more symptomatology, higher levels of emotional distress, and serious consequences from their fluctuating glucose levels. Higher A1c levels would be evident in a more cyclical disease course that lacks adequate glycemic control. The findings from this study extend the information on predictive relationships between illness representations, specifically timeline-cyclical, and glycemic control.

Illness Representations

Another interesting finding from this research study was the relationship between self-care behavior and an individual's perception about the chronic nature of their diabetes. Perceptions of diabetes as less chronic were significantly associated with higher self-care behavior. Diabetes is a chronic, potentially life-threatening illness which affects many aspects of an individual's life. The questions on the IPQ-R questionnaire which measures an individual's perception of the timeline acute/chronic variable focuses on statements about the length of time diabetes will last, whether it is a permanent rather than a temporary condition, expectations of having diabetes for life, and that diabetes will improve over time. Individuals' perceptions about their diabetes being less chronic seem to be counter-intuitive. This finding may support that some individuals have an inaccurate view and knowledge about diabetes. In a study conducted by Jayne and Rankin (2001) Chinese immigrants had misconceptions about the chronicity of their diabetes and several were unsure whether diabetes was an acute or chronic illness. Individuals may be assimilating and appraising information about their diabetes and may not have comprehended the long-term implications of their illness. It is also interesting that this inaccurate view and knowledge of diabetes plays a role in whether an individual participates in higher levels of self-care behavior or not. This finding might also be related to individuals with shorter durations of illness not having experienced some of the chronic complications such as neuropathy, retinopathy, nephropathy, and macrovascular disease that affect individuals later in the disease course.

Duration of illness and degree of glucose control are linked to chronic complications (DeCoster, 2003; Wandell & Gafvels, 2004; West & McDowell, 2002). A feeling of false well-being may occur during the early years of the disease before the individual is confronted with microvascular and macrovascular complications. This may imply that the chronicity of a chronic illness has more influence on an individual's life than the extent of the disease process. This is also supported by Nerenz and Leventhal (1983) who postulated that individuals form different models of perceptions of their illness timeline based on the stage of the illness. These perceptions include a) the acute episode model – short-term treatment followed by cure, b) cyclic model – symptoms subside and then reappear, and c) the chronic model – symptoms need continuing, long term care. Nerenz and Leventhal claim that individuals shift from acute through cyclic to chronic representations of timeline based on the stage of their illness.

Coping Strategies

In this study higher coping efficacy and higher self-care behavior were associated with two problem-focused coping strategies (seeking social support and planful problem-solving) and one emotion-focused coping strategy (positive reappraisal). Higher A1c levels were associated with escape avoidance coping (emotion-focused), confrontive coping (problem-focused), and distancing (emotion-focused).

These findings differ from other research study findings. Previous research supports improved metabolic control, more favorable adjustments, and better emotional status in persons with diabetes are associated with problem-

focused coping strategies (Gafvels & Wandell, 2005; Maes et al., 1996; Rose et al., 2002). Inversely, poor adjustments and adherence, low self-esteem, negative effects, loneliness, and lower quality of life are generally associated with avoidance and emotion-focused coping strategies (Peyrot et al., 1999; Smari & Vaitysdottir, 1997; Weijman et al., 2005).

Folkman and Lazarus (1985) contend that people often use both problem-focused and emotion-focused strategies when dealing with any one problem. According to Folkman and Lazarus (1980, 1986), neither problem-focused nor emotion-focused coping is considered superior over the other.

Positive reappraisal. The findings from this study support that emotion-focused coping strategies such as positive reappraisal can influence positive outcomes in diabetes. Positive reappraisal coping strategy is described as efforts to create positive meaning by focusing on personal growth. Positive reappraisal has a religious dimension to the concept as well. Positive reappraisal is a coping strategy in which a person focuses on what one can do, rather than dwelling on what can not be done. Positive reappraisal involves a reinterpretation of the event in terms of benefits to one's values, beliefs, and goals and finding meaning in the event. Positive meaning reaffirms what one values and helps one to focus on those values while coping with the ongoing stressful event (Folkman, 2001).

This finding may suggest that participants engaged in positive reappraisal to find meaning in living with diabetes and also to strive to regulate the emotional experiences of living with a chronic illness. Attributing positive meaning to certain situations in an individual's life may help that individual cope with the negative

consequences of the situation and enhance their well-being (Folkman, 1997, Folkman & Moskowitz, 2000). Individuals who engage successfully in self-care behavior may feel more positive about themselves resulting in an increased sense of well-being. Attributing positive meaning to their diabetes may also promote a higher sense of perceived coping efficacy to perform self-care activities.

Confrontive coping. Another intriguing finding in this study was that higher A1c levels were associated with confrontive coping strategies which is thought to be a problem-focused coping strategy. Individuals in this study using the confrontive coping strategy experienced more symptomatology and emotional distress, higher beliefs that diabetes had serious consequences, a more cyclical disease course, and had less understanding about their diabetes illness.

Previous research supports that improved metabolic control is usually associated with problem-focused coping strategies (Gafvels & Wandell, 2005; Maes et al., 1996; Rose et al., 2002). Confrontive coping strategies are described as aggressive efforts used to alter a situation and imply that the individual uses some degree of hostility or anger with risk-taking behavior (Lazarus & Folkman, 1984).

Review of the actions taken by individuals using confrontive coping strategies revealed that the two most used actions were “letting feelings out somehow” and “stood my ground and fought for what I wanted.” These actions may have led individuals to maladaptive coping behaviors. These actions imply that individuals may be angry about their diabetes and engaged in risk-taking

behaviors instead of effective self-care behavior. This is evident by the increase in symptomatology experiences, higher perceptions of serious consequences, higher levels of emotional distress, and a more cyclical disease course found in individuals using this type of problem-focused coping strategy. Individuals who had less understanding of their diabetes also engaged in confrontive coping. Inadequate knowledge about their diabetes and the appropriate actions to take to promote glycemic control may cause individuals to participate in risk-taking actions that are detrimental to glycemic control.

Review of previous research (Gafvels & Wandell, 2005; Maes et al., 1996; Rose et al., 2002) findings indicating that improved glycemic control was associated with problem-focused coping strategies revealed individuals in these studies used problem-focused coping strategies such as planned problem-solving and active problem-solving. Individuals using these types of problem-focused coping strategies analyze their situations to arrive at solutions and proceed to take direct actions to correct the problem (Lazarus & Folkman, 1984). This may mean that individuals using planned problem-solving and active problem-solving coping strategies are directing their efforts from a rational, thought provoking approach instead of efforts from a hostile, angry approach producing risk-taking type behavior. This may explain the differences found in the present research study findings with previous research study findings in relationship to problem-focused coping strategies and glycemic outcomes.

Limitations of Study

The majority of the participants were Caucasian and the majority of participants were well educated in this study. Seventy-seven point three percent of the participants had some college, technical school training, Bachelor's degree, or a Graduate degree. The homogenous sample and education level may limit the generalizability of the results. Prevalence of diabetes is higher in other ethnic populations such as African Americans (13.3%), Hispanic/Latino Americans (9.5%), and American Indians/Alaska Natives (12.8%) than Caucasians (8.7%) (ADA, 2005). Previous research studies have linked lower socioeconomic status with poorer health outcomes (Adler & Ostove, 1999; Krieger, Williams, & Moss, 1997). Individuals with lower socioeconomic status may be limited in accessing adequate diabetes care and may not be able to obtain appropriate quality care as well as preventive care (Fiscella, Franks, Gold, & Clancy, 2000). Though these limitations should be considered, the findings from this study may assist in understanding how other ethnic populations view their diabetes and the role that education levels may influence outcomes in diabetes.

The participants used self-report as the method for answering the questions in the questionnaire booklet. Self-report data has been controversial in its subjective nature and controversy exists whether self-report methods are effective in retrieving unbiased data. However, there is evidence that self-report data correlates with other objective health outcomes (Idler & Benyamini, 1997; Finch, Hummer, Reindl, & Vega, 2002; Shadbolt, Barresi, & Craft, 2002).

Another limitation is the cross sectional research method used in this study. Cross sectional studies assess the health status and outcomes of participants at one point in time. Cross sectional studies do not allow for changes over time, therefore, do not evaluate the progressive nature and outcomes of a chronic illness. Diabetes is a complex, life-long illness that requires individuals to adapt to changing health conditions over a long period of time. Longitudinal research may reveal a more accurate picture of the influence that illness representations, emotional distress, coping strategies, and coping efficacy have on patient outcomes in type 2 diabetes.

Implications for Nursing

The findings from this study have implications for nursing practice in the areas of assessment, diabetes management, coping skills training, behavior modification, motivational interviewing, and diabetes education. Psychosocial factors such as illness representations, emotional distress, coping strategies, and coping efficacy can influence lifestyle behavior changes and quality of life of individuals with type 2 diabetes.

Assessment

Nurses can incorporate these study findings to understand the importance of conducting thorough and holistic assessments that address pertinent cognitive, physiological, environmental, cultural, and other psychosocial aspects that may assist or hinder individuals with type 2 diabetes in caring for their diabetes. Nurses should take a holistic approach to diabetes care instead of focusing solely on physical care. Thorough and investigative communications

between nurses and individuals with diabetes are essential in obtaining information about cognitive beliefs, diabetes knowledge level, use of coping strategies, level of coping efficacy, and identifying new or unresolved issues related to diabetes.

Diabetes Management

In this study, a cyclical disease course was predictive of higher A1c levels. Individuals in this study experienced 12 diabetes symptoms out of 34 and hyperglycemia was identified as the most frequent symptom sub-category. These findings may indicate that individuals had inadequate glycemic control resulting in a capricious disease course. These findings support other research that demonstrates that illness representations are predictors of glycemic control in diabetes (Edgar & Skinner, 2003; Griva et al., 2000; Hampson et al., 1995; Glasgow et al., 1997; Skinner & Hampson, 1998; Watkins et al., 2000). Illness representations are generated by individuals from previous and current experiences with their diabetes. Illness representations focus on what individuals believe to be central to their illness and its management. Understanding the relationships between illness representations and diabetes outcomes will assist nurses in understanding how individuals regulate their health over time; how individuals interpret, value, and internalize health related information; and how this health information will assist individuals in setting diabetes related goals in the future.

Diabetes requires major lifestyle changes in individuals' lives to manage their diabetes to prevent acute and chronic complications. Diabetes self-

management training is integral in providing individuals with the skills to manage their diabetes illness on a day to day basis. Setting goals is an essential component of diabetes self-management. Nurses should assist individuals to set goals that are tailored specifically for individuals. In the publication, *National Standards for Diabetes Education* (ADA, 2006), ADA recommends that individuals should choose goals based on the following areas a) knowledge about the disease process and treatment options; b) nutritional management; c) physical activity; d) medication administration; e) monitoring blood glucose; f) preventing, detecting, and treating acute and chronic complications; and g) psychosocial adjustment to diabetes. Nurses should conduct periodic reassessment of goal achievement to identify ongoing issues or problems with self-management behavior.

Nurses can be instrumental in teaching individuals appropriate self-management strategies (diet, exercise, blood glucose monitoring, and medications) to maintain glycemic control. Nurses should educate individuals on the importance of monitoring their blood glucose levels to achieve targeted blood glucose levels. Nurses should evaluate glycemic control at each health visit to ensure individuals are within targeted blood sugar ranges. Evaluation of glycemic control will assist individuals in maintaining appropriate glucose levels to obtain a more stable, less cyclical disease course.

Blood glucose diaries are a tool that can be implemented to evaluate blood sugar levels over periods of time to target interventions to achieve adequate glycemic control. Nurses can use this information in pattern

management of blood sugars to identify potential times individuals are experiencing hyperglycemic episodes. Blood glucose diaries can also provide information about diet, exercise, blood glucose monitoring, and medication activities related to hyperglycemic episodes providing evidence for targeted educational interventions.

Coping Skills Training

Both problem-focused and emotion-focused coping strategies influenced participants' levels of perceived coping efficacy, self-care behavior, and glycemic control. Higher perceived coping efficacy and higher self-care behavior were associated with a more supportive social environment, use of planful problem-solving techniques, and finding positive meaning in stressful experiences by focusing on personal growth. Higher A1c levels were associated with the use of confrontive coping to aggressively alter diabetes situations, distancing or detaching from the situation to minimize the situation, and behavioral efforts to escape or avoid the situation.

Nurses have an important role in teaching individuals with diabetes adaptive coping skills to enhance individuals' perceived coping efficacy to successfully manage their diabetes. Nurses should examine use of coping strategies to evaluate that appropriate coping strategies are being implemented by individuals which results in positive health outcomes for individuals. Research supports that coping skills training has been successful in increasing self-efficacy levels, decreasing emotional distress, reducing A1c levels, and improving quality of life in individuals with diabetes (Grey et al., 1998). Coping skills education

should focus on instilling skills that will assist individuals in facing day to day challenges in living with diabetes. These education sessions should include assertiveness, interpersonal relationships, decision-making, problem-solving, stigma management, and time management skills training (Livneh & Antonak, 2005). Additionally, nurses can teach individuals with diabetes relaxation techniques, visualization techniques, and social and self-assertiveness skills to help cope with psychosocial aspects of living with diabetes. Coping skills training may enhance perceived coping efficacy levels of individuals to better manage their diabetes illness resulting in glycemic control.

Cognitive Behavioral Therapy

Individuals who viewed their diabetes as a chronic illness perceived serious consequences from their illness, held beliefs that their diabetes could not be controlled well by medical treatments, and experienced higher emotional distress. Nurses can assist individuals in dealing with inaccurate illness beliefs and emotional distress by using Cognitive Behavioral Therapy (CBT) techniques (Beck, 1995). Individuals' illness beliefs may be inaccurate resulting in higher emotional distress and ineffective coping behavior. CBT focuses on modifying emotions and improving coping behaviors by assisting individuals to identify dysfunctional beliefs, adopting appropriate beliefs, and testing new beliefs in real life situations. Previous research supports the effectiveness of CBT in diabetes (Snoek et al., 2001; Weinger et al., 2002). The findings from this research will assist nurses in understanding the effects illness beliefs may have in the

diabetes population and assist in targeting CBT activities to reduce emotional distress and promote effective coping behavior.

Motivational Interviewing

Findings from this study revealed that participants were more participative in taking their prescribed medications than participating in other self-care behavior such as diet, blood glucose monitoring, foot care, and exercise. Findings also revealed that participants with a greater understanding of their diabetes were more engaged in self-care behavior.

Nurses can assist individuals with type 2 diabetes change their health behavior by engaging in motivational interviewing (MI) techniques during encounters. Motivational interviewing fits nicely with the self-regulation model in emphasizing individuals' personal choice and responsibility for future health behavior decision-making. Key principles in MI include (a) using a therapeutic interviewing style to build rapport by using skills such as open-ended questions and reflective listening, (b) rolling with resistance, and (c) exploring ambivalence about changing health behavior (Emmons & Rollnick, 2001). Addressing unhealthy behavior in the diabetes population can help prevent acute and chronic complications in the future. Nurses can be a catalyst in helping individuals by creating a collegial, non-confrontational environment which promotes open communication about what is important to the individual; identifying barriers for change; setting realistic, achievable goals; and promoting individuals' self-efficacy and empowerment to elicit positive health behavior changes (Ossman, 2004).

Diabetes Education

Higher self-care behavior was associated with the perception of diabetes being less chronic. Diabetes is a chronic, potentially life-threatening illness which affects many aspects of an individual's life. Treatment and self-management behavior for effective diabetes control demands significant changes in lifestyle patterns such as diet and exercise, frequent monitoring of blood glucose, and the potential use of oral or insulin medications. Treatment regimens may seem complicated and difficult to follow by individuals with diabetes. Nurses are in pivotal roles to provide education to individuals with diabetes. Understanding individuals' perceptions and misconceptions about diabetes can assist nurses in developing appropriate teaching strategies to ensure individuals achieve accurate knowledge about diabetes, its causes, and its management. By gaining knowledge of illness representations, coping strategies, and coping efficacy nurses can educate individuals on these factors to implement successful self-management strategies specifically tailored for individuals.

The findings from this research has added new knowledge to identifying and understanding health beliefs, cognitions, coping strategies, and coping efficacy and how these factors influence self-regulation behavior and glycemic control. Nurses can use this knowledge to assist individuals as they progress from the early stages of diabetes to later stages of diabetes as their health beliefs, cognitions, emotional distress, and coping efforts change over time.

In summary, the findings from this study have implications for nursing practice in the areas of assessment, diabetes management, coping skills training,

behavior modification, motivational interviewing, and diabetes education. The findings confirm how illness representations, emotional distress, coping strategies, and coping efficacy influence self-care behavior and health outcomes. Nurses should incorporate these assessment, disease management, coping skills training, behavior modification, motivational interviewing, and diabetes education strategies into their daily practice to help individuals identify successful coping strategies, enhance coping efficacy, and change misconceptions about diabetes to improve self-care behavior and health outcomes, which may reduce or prevent acute and chronic complications in diabetes.

Implications for Healthcare

Diabetes has enormous health care costs that affect individuals as well as the health care expenditures in the United States. The American Diabetes Association reported in the year 2002, the total annual medical expenditures of diabetes mellitus were estimated at $132 billion (2003). Direct expenditures for medical care and treatments totaled $91.8 billion and indirect expenditures related to disability and mortality were $39.8 billion (ADA, 2003). Strategies to improve self-care behavior and glycemic control will assist in decreasing acute and chronic complications, leading to an improved quality of life for individuals with type 2 diabetes.

Prevention of acute and chronic complications can have enormous effects on health care expenditures. State and federally funded programs for diabetes education and care need to be developed and implemented with psycho-educational interventions that are effective across the course of the disease

process. Providing health care providers' with knowledge on how illness representations, emotional distress, coping strategies, and coping efficacy influence the outcomes of diabetes care will enhance the development of appropriate treatment regimens and psycho-educational interventions. The combination of this new knowledge with diabetes self-care recommendations will help provide holistic care to individuals with type 2 diabetes.

Implications for Theory Development

The results of this study demonstrate the usefulness of Leventhal's self-regulation theory for understanding how psychosocial factors influence how people perceive health threats of illness and how their beliefs influence their decisions in self-regulation behavior and health outcomes. Leventhal's self-regulation theory provided an appropriate framework to examine illness representations, emotional distress, coping strategies, and coping efficacy of individuals with type 2 diabetes.

Leventhal postulates that individuals develop both cognitive and emotional representations to their illness threats to help manage and solve problems related to their illness (Leventhal et al., 1980; Leventhal et al., 1984). Relationships between the illness representation variables provide support for this hypothesis. Participants who viewed their diabetes illness as chronic and cyclical in nature perceived more serious consequences from their diabetes, more emotional distress, more symptomatology, lower perceived personal and treatment control, and less illness coherence. Relationships were found between

higher perceived personal control, higher beliefs about treatment control, and a greater understanding of diabetes illness.

Leventhal proposes that coping efficacy (appraisal) evaluates the effectiveness of coping strategies and determines whether the coping strategies have moved the individual towards or further away from their illness threat (Leventhal et al., 1980; Leventhal et al., 1984). Hierarchical regression analysis demonstrated that coping efficacy uniquely accounted for 9% of the variance in self-care behavior. Higher coping efficacy was predictive of higher self-care behavior. Higher coping efficacy was also associated with higher levels of perceived personal control, treatment control, and a greater understanding of diabetes. This relationship demonstrates that efficacious coping influences the confidence of individuals in handling problems with their diabetes and using effective coping strategies which moves individuals further away from their illness threats.

Additionally, relationships between illness representations and health outcomes were supported. Hierarchical regression analysis demonstrated that illness representation, timeline-cyclical, uniquely accounted for 12% of the variance in A1c levels. A cyclical disease course was predictive of higher A1c levels. This relationship demonstrates that individuals experiencing fluctuating glycemic control viewed their illness as turbulent and potentially uncontrollable at times. Illness representations are perceptions obtained from past and current experiences with the disease process. This finding supports that cognitive

perceptions of disease experiences such as timeline-cyclical can be predictive of health outcomes (A1c levels).

In summary, the findings from this study demonstrated some of the relationships among the components of Leventhal's self-regulation theory. The findings demonstrate the usefulness of the theory as a framework to examine the relationships between illness representations, emotional distress, coping strategies, and coping efficacy as predictors of self-care behavior and A1c levels.

Implications for Future Research

Future prospective and intervention studies are warranted to determine the generalizability of the findings from this study. Few studies have been conducted examining illness representations, emotional distress, coping strategies, and coping efficacy as predictors of self-care behavior and glycemic control.

Research needs to be conducted on educational intervention programs that incorporate illness representations to determine diabetes outcome improvements. Longitudinal studies may provide information on how diabetes illness representations change over the course of the illness and give insight into specific interventions that can be targeted at different time frames during the illness process.

Research needs to be conducted to test whether coping efficacy and coping strategies are mediating factors in the self-regulation process. Coping efficacy research needs to be conducted to further delineate the effects of coping efficacy on self-care behavior in the diabetes population. Research needs to be

conducted to compare actions of different problem-focused coping strategies to determine which actions produce positive health outcomes and which actions contribute to negative health outcomes.

In summary, this study affirmed the importance of how illness representations, specially timeline-cyclical, and coping efficacy influence self-care behavior and glycemic control. Illness representations, specially timeline-cyclical, and coping efficacy are important factors to explore in dealing with individuals with diabetes to achieve positive health behavior and outcomes. Further research is needed to expand the knowledge base and develop targeted interventions related to illness representations, especially timeline cyclical, and coping efficacy in the diabetes population.

Conclusion

Encouraging individuals with type 2 diabetes to take responsibility and make informed choices about self-regulation behavior is imperative in maximizing their quality of life and reducing or eliminating acute and chronic complications of diabetes. Leventhal's self-regulation theory provided a framework for understanding factors that influence the decisions of individuals to participate in self-management behavior as related to diabetes management. Diabetes self-regulating behavior requires commitment and dedication from individuals on a daily basis to control their glycemic levels. Understanding how psychological factors influence individuals' decisions is vital to assist individuals in caring for their diabetes.

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Appendix A

Power Analysis

Appendix A
Power Analysis Procedures

Numeric Results

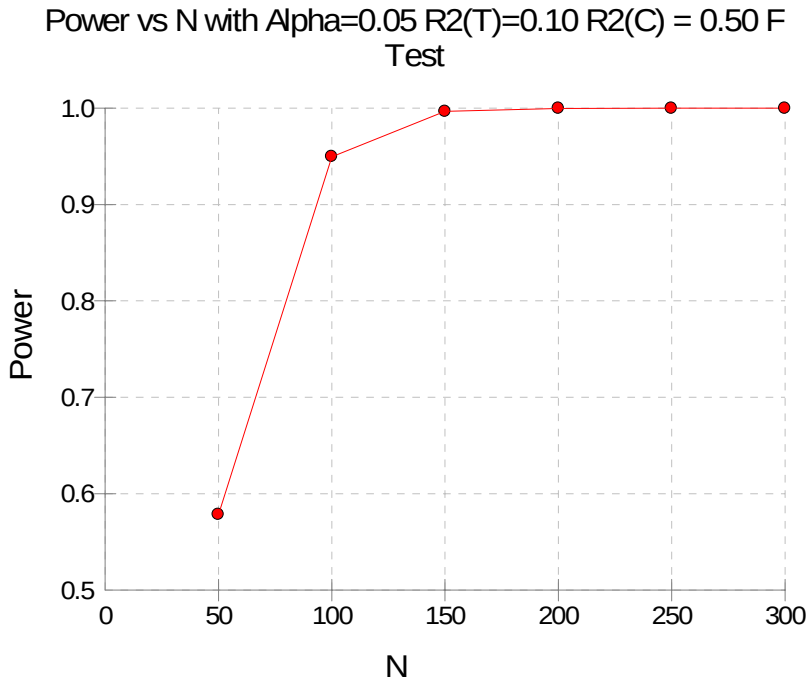
				Ind. Variables Tested		Ind. Variables Controlled	
Power	**N**	**Alpha**	**Beta**	**Cnt**	**R2**	**Cnt**	**R2**
0.57848	50	0.05000	0.42152	8	0.10000	11	0.50000
0.94982	100	0.05000	0.05018	8	0.10000	11	0.50000
0.99685	150	0.05000	0.00315	8	0.10000	11	0.50000
0.99987	200	0.05000	0.00013	8	0.10000	11	0.50000
1.00000	250	0.05000	0.00000	8	0.10000	11	0.50000
1.00000	300	0.05000	0.00000	8	0.10000	11	0.50000

Report Definitions

Power is the probability of rejecting a false null hypothesis.
N is the number of observations on which the multiple regression is computed.
Alpha is the probability of rejecting a true null hypothesis. It should be small.
Beta is the probability of accepting a false null hypothesis. It should be small.
Cnt refers to the number of independent variables in that category.
R2 is the amount that is added to the overall R-Squared value by these variables.
Ind. Variables Tested are those variables whose regression coefficients are tested against zero.
Ind. Variables Controlled are those variables whose influence is removed from experimental error.

Summary Statements

A sample size of 50 achieves 58% power to detect an R-Squared of 0.10000 attributed to 8 independent variable(s) using an F-Test with a significance level (alpha) of 0.05000. The variables tested are adjusted for an additional 11 independent variable(s) with an R-Squared of 0.50000.



Appendix B

Letter of Agreement from Recruitment Site

Appendix B

MEDICAL SPECIALISTS

Endocrinology • Internal Medicine • Diabetes Mellitus
Thyroid Disease • Osteoporosis Diagnostic Center • Cardiology

Jerome B. Blumenthal, M.D., FACC
S.J. Rosenbloom, Ph.D., M.D., FACP
Nitin N. Mayur, M.D.
Jean E. Molinary, D.O.
Sharvari N. Rangnekar, M.D.
Sharnee E. Straub, RN, MSN, FNP

55 Whitcher Street
Suite 400
Marietta, Georgia 30060
Telephone (770) 422-2004
Fax (770) 422-8465
Email nan.cox@wellstar.org

December 9, 2005

Ms. Tricia Hart, MS, PhD(c), RN
Coordinator Center for Nursing

Dear Ms. Hart:

Kindly forward this on to the IRB.

I am in full support of Ms. Tricia Hart's thesis for her doctorate and am privileged to assist with our diabetes clinic group making available patients who are candidates for this very important study.

If there is any further information I can provide, kindly call me.

Sincerely yours,

S.J. Rosenbloom, Ph.D., M.D.

SJR:dh

Appendix C

Letter of Agreement from Recruitment Site

Appendix C

ATLANTA DIABETES ASSOCIATES
Endocrinology & Diabetes

PAUL C. DAVIDSON, M.D.
BRUCE W. BODE, M.D.
R. DENNIS STEED, M.D.
DAVID G. ROBERTSON, M.D.
N. SPENCER WELCH, M.D.
CAROL GREENLEE, M.D.

1/3/06

Patricia,

Atlanta Diabetes Associates has reviewed your proposal to serve as a recruitment sites for your study. The title of the study is: *Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes.* We have decided to allow you to use our practice as one of your recruitment sites.

Please coordinate placement of flyers and study related materials with me. I will also work with you to obtain the participants' last hemoglobin A1c levels from their medical record located in our office.

Please contact me when you are ready to move forward with your study.

Sincerely,

Jill H. Sax, RN, CDE
Clinical Research Manager
Atlanta Diabetes Associates

77 COLLIER ROAD, N.W., SUITE 2080, ATLANTA, GEORGIA 30309 (404) 355-4393 FAX (404) 609-7648

Appendix D

Letter of Agreement from Recruitment Site

Appendix D

Y. KHALID SIDDIQ, M.D.
Diabetes, Hormone Disorders, Metabolic
Bone Diseases and Internal Medicine

3903 South Cobb Drive
Suite 200
Smyrna, GA 30080
770-948-5578
FAX: 770-438-5153

1700 Hospital South Drive
Suite 200
Austell, GA 30106
770-948-5578
FAX: 770-941-1042

To Whom It May Concern:

I have reviewed the attached research study proposal submitted by Patricia Hart and am willing to allow my office to be a recruitment site for the study.

If there are any further questions in this regard please do not hesitate to call me.

Sincerely

Y. Khalid Siddiq M.D.
(770) 948-5578

Appendix E

Letter of Agreement from Recruitment Site

Appendix E

GEORGIA KIDNEY ASSOCIATES, INC.

Nephrology • Hypertension • Internal Medicine

Edward D. Himot, M.D. • Indira Chervu, M.D., F.A.C.P.
Robert D. Jansen, M.D. • Akin O. Ogundipe, M.D. • Vijay Nath, M.D.
Marietta Miller, Administrator

February 6, 2006

Patricia Hart, MS, PhD(c), RN
5181 Marsden Trace
Powder Springs, GA 30127

Dear Ms. Hart,

This letter is to serve as documentation that I have approved for my medical practice, Georgia Kidney Associates, Inc., 55 Whitcher Street, Suite 460, Marietta, GA 30060, to serve as a recruitment site for the following research study: Illness Representation, Emotional Distress, Coping Strategies and Coping Efficacy as Predictors of Type 2 Diabetes Outcomes. It is my understanding that you are conducting this research as part of your doctoral education requirements.

I am in support of this research study and my site's participation. If any further information is needed, please contact my office.

Sincerely,

Robert Jansen, MD
RDJ/lp

55 Whitcher Street • Suite 460 • Marietta, Georgia 30060
120 Stonebridge Parkway • Suite 330 • Woodstock, Georgia 30189
Telephone: (770) 427-7389 • If no answer: (770) 928-5315 • Fax: (770) 427-1492

Appendix F

Letter of Agreement from Recruitment Site

Appendix F

APR. -04' 06(TUE) 15:19 K' STONE ADMIN TEL:770 793 8063 P. 002

WELLSTAR
Kennestone Hospital

677 Church Street
Marietta, Georgia 30060
770-793-5000
www.wellstar.org

April 4, 2006

To Whom It May Concern:

Tricia Hart, RN, has been granted approval to use the WellStar Kennestone Medical Clinic for recruitment of individuals to participate in her research project, "Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes."

Respectfully,

Teresa Reynolds, RN

Teresa Reynolds, RN MSA
Director Nursing Acute Care
WellStar Kennestone Hospital

Appendix G

Letter of Agreement from Recruitment Site

Appendix G

WELLSTAR
Cobb Hospital

3950 Austell Road
Austell, Georgia 30106
770-732-4000
www.wellstar.org

April 11, 2006

TO WHOM IT MAY CONCERN:

This is to advise that Tricia Hart, MS, PhD(c), RN, Coordinator, Center for Nursing Excellence, has been granted permission to recruit participants from the WellStar Cobb Hospital Medical Clinic for research study. The study is entitled "Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes".

Should you have any questions, I may be reached at the numbers below.

Sincerely,

Nina Evans RN, MBA

Nina Evans, RN, BSN, MBA
Director of Nursing
Patient Services Division
WellStar Cobb Hospital

Appendix H

Letter of Agreement from Recruitment Site

Appendix H

WELLSTAR
Health System

Medical Management
805 Sandy Plains Road
Marietta, GA 30066
(770) 792-5441
Fax (770) 792-1490

March 7, 2006

Georgia State University
Internal Review Board
P.O. Box 4019
Atlanta, GA 30802-4019

Georgia State University IRB Committee:

WellStar Diabetes Education agrees to serve as recruitment sites at Cobb Hospital and Kennestone Hospital for Tricia Hart's proposed research study: *Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes*. This acceptance is pending approval of the proposed changes to Georgia State University's Consent Form and the use of WellStar's acknowledgement form.

Please feel free to contact me with any questions at 770-792-5440.

It is our pleasure to play a role in research to improve the delivery of care to our diabetes patients in the communities we serve.

Sincerely,

Nancy Kemp

Nancy Kemp
VP Medical Management

CC: Tricia Hart

Appendix I

Letter of Agreement from Recruitment Site

Appendix I

Saint Joseph's Hospital Nursing Research Approval Letter

From: Beard, Susan
Sent: Thu Apr 20 17:35:28 2006
To: Williams, Gay
Cc: Loy, Jennifer; Meeks-Sjostrom, Diana
Subject: Research Proposal

Gay,

The Nursing Research Council approved Patricia Hart's research proposal entitled "Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes" on Monday, April 17. Patricia can contact you for scheduling the patient recruitment phase of her study.

Thank you for allowing her this opportunity,

Susan Beard, RN, BSN, MS

Chairman of Nursing Research Council

Educational Specialist

extension 7577

Appendix J

Letter of Agreement from Recruitment Site

Appendix J

PIEDMONT HOSPITAL

April 11, 2006

Patricia Hart, MS, PhD(c), RN
5181 Marsden Trace
Powder Springs, Ga 30127

Dear Ms. Hart:

The Piedmont Hospital Nursing Research Committee has reviewed your research proposal entitled ILLNESS REPRESENTATION, EMOTIONAL DISTRESS, COPING STRATEGIES, AND COPING EFFICACY AS PREDICTORS OF OUTCOMES IN TYPE 2 DIABETES and has approved data collection for your study at Piedmont Hospital.

Pam Cowart, RN, MSN, CCNS, NRC Chair will be your contact person should you have any research related questions. Mary Ransbotham, RN will be your site coordinator during your study. We will serve as resource and liaison persons during your data collection activities. Please feel free to contact us should you have any questions or concerns

We are pleased that you are using Piedmont Hospital as one of your sites for data collection and we do want you to share your results with us.

Best wishes to you in your research endeavor.

Sincerely,

Pam Cowart RN MSN CCNS

Pam Cowart, RN, MSN, CCNS
Nursing Research Committee Chairperson
404-605-1732

100 Top Hospitals

Appendix K

Letter of Introduction

Appendix K

Diabetes Research Study

Hello, my name is Tricia Hart and I am a registered nurse who is attending Georgia State University to obtain my Doctorate degree in Nursing. I am conducting a research study as part of my doctorate education requirements. My research is looking at the relationship between how individuals with type 2 diabetes view their illness, the emotional distress that is experienced with diabetes, how individuals cope with their diabetes, and the impact these factors have on blood sugar levels and participation with self-care activities.

I am seeking 150 men and women to participate in the study. Participants must have had type 2 diabetes for at least 1 year or more, be 18 years of age or older, and have had an A1c level drawn within the past 30 days to qualify for the study.

The study consists of completing a booklet with 5 questionnaires. It should take you about 30 minutes to complete the questionnaires. The first questionnaire includes questions about yourself such as age, education, and duration of your diabetes. The second questionnaire looks at how you view your diabetes. The third questionnaire looks at how you cope with your diabetes. The fourth questionnaire looks at how well you feel you have coped with your diabetes in the past and how you think you will be able to cope with your diabetes in the future. The fifth questionnaire looks at your participation with self-care activities. I will also need to obtain your last hemoglobin A1c level from your medical record at your physician office.

I would like to invite you to participate in this study. Your input can be vital in helping doctors and nurses understand how to help individuals with diabetes better manage their illness. The questionnaire booklet will be mailed to your home for your completion.

The information you provide will be confidential. You may refuse to participate in the study or stop answering questions at any time you wish without affecting the care you receive.

You will be paid a $10.00 gift card from CVS or Eckerd or Walgreens Drug store for your particpation in this study with the completion and return of the questionnaire booklet.

If you would be interested in participating in this study, please write your name and telephone number on the card and place in the box marked “Type 2 Diabetes Study” located at the check out desk. I will contact you in a few days by telephone.

If you prefer, you may call 770-427-2544 and leave your name and telephone number and I will return your call and answer any additional questions you might have about the study. I appreciate your time and interest in this study.

Thank you
Tricia Hart, MS, PhD(c), RN

Appendix L

Demographic Data Questionnaire

Appendix L

Demographic Data Questionnaire

Please answer the following questions by either filling in the blank space or by checking the choice that most closely matches your situation.

1. Sex: ☐ Male ☐ Female

2. How old are you? _____years old

3. Date of Birth (Month/Day/Year): ____/____/____

4. A1c level within past 30 days? _____

5. How many years have you had diabetes? _____years

6. Which type of diabetes did your doctor say you have (choose one)?

   ☐ Type 2, also called adult onset, noninsulin dependent diabetes (some people with type 2 diabetes take insulin)
   ☐ Type 1, also called juvenile diabetes, insulin-dependent diabetes

7. What is your marital status (choose one)?

   ☐ Single, Never married
   ☐ Married
   ☐ Living with a Partner
   ☐ Separated
   ☐ Divorced
   ☐ Widowed
   ☐ Other: _____

8. What is your ethnic origin/race (choose one)?

   ☐ White/Caucasian
   ☐ Black/African American
   ☐ Hispanic/Latino
   ☐ Native American
   ☐ Asian or Pacific Islander
   ☐ Arabic
   ☐ Other: _____

9. How much schooling have you had (choose one)?

- ☐ 8th grade or less
- ☐ Some high school
- ☐ High school graduate or GED
- ☐ Some college or technical school
- ☐ College graduate (bachelor's degree)
- ☐ Graduate degree (master's or doctorate)

10. Which of the following best describes your current employment status (choose one)?

- ☐ Working Full Time, 51 hours or more hours a week
- ☐ Working Full Time, 41 hours to 50 hours a week
- ☐ Working Full Time, 35 hours to 40 hours a week
- ☐ Working Part Time, less than 35 hours a week
- ☐ Unemployed or laid off and looking for work
- ☐ Unemployed and not looking for work
- ☐ Homemaker
- ☐ In School
- ☐ Retired
- ☐ Disabled, not able to work

11. Family Income (choose one):

- ☐ Less than $10,000
- ☐ $10,000 to $20,999
- ☐ $21,000 to $30,999
- ☐ $31,000 to $40,999
- ☐ $41,000 to $50,999
- ☐ $51,000 to $70,999
- ☐ $71,000 to $90,999
- ☐ $91,000 to $100,999
- ☐ Above $101,000

12. What is your living arrangement?

- ☐ Home
- ☐ Apartment
- ☐ Assisted Living
- ☐ Nursing Home
- ☐ Other: _____

13. How many people live in your home with you? _____

14. How many children do you have? _____

15. How many children currently live with you? _____

Appendix M

Illness Perception Questionnaire-Revised

Appendix M

The Illness Perception Questionnaire

YOUR VIEWS ABOUT YOUR DIABETES

Listed below are a number of symptoms that you may or may not have experienced since your diabetes. Please indicate by **circling** *YES* or *NO*, whether you have experienced any of these symptoms since your diabetes, and whether you believe that these symptoms are related to your diabetes.

	I have experienced this symptom *since my diabetes*			**This symptom is *related to my diabetes***	
1. Little get up and go (energy)	Yes	No		Yes	No
2. Pain in the calves when walking	Yes	No		Yes	No
3. A numb (reduced sensation) feeling in the feet	Yes	No		Yes	No
4. A general feeling of fatigue	Yes	No		Yes	No
5. Shortness of breath at night	Yes	No		Yes	No
6. Feeling sleepy or drowsy	Yes	No		Yes	No
7. Difficulty concentrating	Yes	No		Yes	No
8. Moodiness	Yes	No		Yes	No
9. A numb (reduced sensation) feeling in the hands	Yes	No		Yes	No
10. Constantly blurred vision (even when wearing glasses)	Yes	No		Yes	No

	I have experienced this symptom *since my diabetes*			**This symptom is *related to my diabetes***	
11. Tingling in the limbs at night	Yes	No		Yes	No
12. Being very thirsty	Yes	No		Yes	No
13. Heart palpitations or throbbing in the heart region	Yes	No		Yes	No
14. Deteriorating eyesight	Yes	No		Yes	No
15. Burning pain in the calves at night	Yes	No		Yes	No
16. Dry mouth	Yes	No		Yes	No
17. Increasing fatigue during the course of the day	Yes	No		Yes	No
18. Flashes of light or black spots in the field vision	Yes	No		Yes	No
19. Irritability right before mealtimes	Yes	No		Yes	No
20. Fatigue when getting up in the morning	Yes	No		Yes	No
21. Shooting pains in the legs	Yes	No		Yes	No
22. Alternating sharp and blurry vision	Yes	No		Yes	No
23. Frequent need to urinate	Yes	No		Yes	No
24. Pain in the chest or heart region	Yes	No		Yes	No

	I have experienced this symptom *since my diabetes*			**This symptom is *related to my diabetes***	
25. Burning pain in the legs during the day	Yes	No		Yes	No
26. Tingling or prickling in hand or fingers	Yes	No		Yes	No
27. Quickly becoming annoyed or irritated	Yes	No		Yes	No
28. Suddenly reduced eyesight	Yes	No		Yes	No
29. A strange feeling in the (lower) legs or feet when they are touched	Yes	No		Yes	No
30. Shortness of breath during physical exertion	Yes	No		Yes	No
31. An unclear feeling in the head	Yes	No		Yes	No
32. Drinking a lot (all kinds of liquids)	Yes	No		Yes	No
33. Difficulty staying attentive	Yes	No		Yes	No
34. Tingling or prickling in the legs or feet	Yes	No		Yes	No

I am interested in your own personal views of how you see your current diabetes.
Please indicate how much you agree or disagree with the following statements about your diabetes by placing a **check mark** in the appropriate box.

	VIEWS ABOUT YOUR DIABETES	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
IP1	My diabetes will last a short time					
IP2	My is likely to be permanent rather than temporary					
IP3	My diabetes will last for a long time					
IP4	This will pass quickly					
IP5	I expect to have this diabetes for the rest of my life					
IP6	My diabetes is a serious condition					
IP7	My diabetes has major consequences on my life					
IP8	My diabetes does not have much effect on my life					
IP9	My diabetes strongly affects the way others see me					
IP10	My diabetes has serious financial consequences					

	VIEWS ABOUT YOUR DIABETES	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
IP11	My diabetes causes difficulties for those who are close to me					
IP12	There is a lot which I can do to control my symptoms					
IP13	What I do can determine whether my diabetes gets better or worse					
IP14	The course of my diabetes depends on me					
IP15	Nothing I do will affect my diabetes					
IP16	I have the power to influence my diabetes					
IP17	My actions will have no affect on the outcome of my diabetes					
IP18	My diabetes will improve in time					
IP19	There is very little that can be done to improve my diabetes					
IP20	My treatment will be effective in curing my diabetes					

	VIEWS ABOUT YOUR DIABETES	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
IP21	The negative effects of my diabetes can be prevented (avoided) by the treatment					
IP22	My treatment can control my diabetes					
IP23	There is nothing which can help my condition					
IP24	The symptoms of my condition are puzzling to me					
IP25	My diabetes is a mystery to me					
IP26	I don't understand my diabetes					
IP27	My diabetes doesn't make any sense to me					
IP28	I have a clear picture or understanding of my condition					
IP29	The symptoms of my diabetes change a great deal from day to day					
IP30	My symptoms come and go in cycles					
IP31	My diabetes is very unpredictable					

	VIEWS ABOUT YOUR DIABETES	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
IP32	I go through cycles in which my diabetes gets better and worse					
IP33	I get depressed when I think about my diabetes					
IP34	When I think about my diabetes I get upset					
IP35	My diabetes make me feel angry					
IP36	My diabetes does not worry me					
IP37	Having this diabetes makes me feel anxious					
IP38	My diabetes makes me feel afraid					

CAUSES OF MY DIABETES

I am interested in what **you** consider may have been the cause of your diabetes. All people are very different, there is not correct answer for this question. I am most interested in your own views about the factors that caused your diabetes rather than what others including your doctors or family may have suggested to you. Below is a list of possible causes for your diabetes. Please indicate how much you agree or disagree that they were causes for you by placing a **check mark** in the appropriate box.

	POSSIBLE CAUSES	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
C1	Stress or worry					
C2	Hereditary – it runs in my family					
C3	A germ or virus					
C4	Diet or eating habits					
C5	Chance or bad luck					
C6	Poor medical care in my past					
C7	Pollution in the environment					
C8	My own behavior					
C9	My mental attitude e. g. thinking about life negatively					
C10	Family problems or worries					
C11	Overwork					
C12	My emotional state e. g. feeling down, lonely, anxious, empty					
C13	Ageing					

	POSSIBLE CAUSES	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
C14	Alcohol					
C15	Smoking					
C16	Accident or injury					
C17	My personality					
C18	Altered immunity					

In the table below, please list in rank-order the three most important factors that you now believe caused **YOUR diabetes**. You may use any of the items form the box above, or you may have additional ideas of your own.

The most important causes for me:

1. _____
2. _____
3. _____

Appendix N

Letter of Permission

Appendix N

From: "Snoek, FJ" <fj.snoek@vumc.nl> Add to Address Book
Date: 2005/06/12 Sun PM 05:49:55 EDT
To: "'hartrish@bellsouth.net '" <hartrish@bellsouth.net>
Subject: RE: re: Questionnaire

Dear Tricia,
Please do!.

best regards
Frank Snoek

From: hartrish@bellsouth.net
To: fj.snoek.psychol@med.vu.nl
Sent: 6/11/2005 4:40 PM
Subject: Re: re: Questionnaire

Dr Snoek
I am preparing my proposal for my dissertation entitled, "Illness Representation, Emotional distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes." One part of the study uses the Illness Perception Questionnaire (IPQ-R) by Moss-Morris, R., Weinman, J., Petrie, K. J., Horne, R., Cameron, L. D., & Buick to explore how individuals view their diabetes. One part of the questionnaire is the illness identity subscale which list generic symptoms and asks the individual which symptoms they have experienced and which symptoms individuals relate to their diabetes. The authors encourage researchers to tailor the symptoms based on the chronic illness that they are studying since the list on the questionnaire is so generic. Here is the website that has the IPQ-R questionnaires and website: http://www.uib.no/ipq/

I was wondering if you would give me permission to use the symptoms and subcategories as outlined in the DSC and place them into the illness identity section of IPQ-R for my study? I would be sure to reference the DSC article and that I obtained permission from you and attach your permission statement as an Appendix in my dissertation.

Thank you for considering this request. I feel the DSC symptom list is comprehensive and would add great benefit to my study.

Thank you
Tricia Hart

Appendix O

Ways of Coping Questionnaire-Revised

Appendix O

Ways of Coping (Revised)

Please read each item below and indicate by **circling** the number in the appropriate column to what extent you use it in coping with stressful events in everyday life in managing your diabetes.

	Not Used	Used Some What	Used Quite A Bit	Used A Great Deal
1. Just concentrated on what I had to do next - the next step	0	1	2	3
2. I tried to analyze the problem in order to understand it better	0	1	2	3
3. Turned to work or substitute activity to take my mind off things	0	1	2	3
4. I felt that time would make a difference – the only thing to do was to wait	0	1	2	3
5. Bargained or compromised to get something positive from the situation	0	1	2	3
6. I did something which I didn't think would work, but at least I was doing something	0	1	2	3
7. Tried to get the person responsible to change his or her mind	0	1	2	3
8. Talked to someone to find out more about the situation	0	1	2	3
9. Criticized or lectured myself	0	1	2	3
10. Tried not to burn my bridges, but leave things open somewhat	0	1	2	3
11. Hoped a miracle would happen	0	1	2	3
12. Went along with fate; sometimes I just have bad luck	0	1	2	3
13. Went on as if nothing had happened	0	1	2	3

	Not Used	Used Some What	Used Quite A Bit	Used A Great Deal
14. I tried to keep my feelings to myself	0	1	2	3
15. Looked for the silver lining, so to speak; tried to look on the bright side of things	0	1	2	3
16. Slept more than usual	0	1	2	3
17. I expressed anger to the person(s) who caused the problem	0	1	2	3
18. Accepted sympathy and understanding form someone	0	1	2	3
19. I told myself things that helped me to feel better	0	1	2	3
20. I was inspired to do something creative	0	1	2	3
21. Tried to forget the whole thing	0	1	2	3
22. I got professional help	0	1	2	3
23. Changed or grew as a person in a good way	0	1	2	3
24. I waited to see what would happen before doing anything	0	1	2	3
25. I apologized or did something to make up	0	1	2	3
26. I made a plan of action and followed it	0	1	2	3
27. I accepted the next best thing to what I wanted	0	1	2	3
28. I let my feelings out somehow	0	1	2	3
29. Realized I brought the problem on myself	0	1	2	3
30. I came out of the experience better than when I went in	0	1	2	3

	Not Used	Used Some What	Used Quite A Bit	Used A Great Deal
31. Talked to someone who could do something concrete about the problem	0	1	2	3
32. Got away from it for awhile; tried to rest or take a vacation	0	1	2	3
33. Tried to make myself feel better by eating, drinking, smoking, using drugs or medication, etc	0	1	2	3
34. Took a big chance or did something very risky	0	1	2	3
35. I tried not to act too hastily or follow my first hunch	0	1	2	3
36. Found new faith	0	1	2	3
37. Maintained my pride and kept a stiff upper lip	0	1	2	3
38. Rediscovered what is important in life	0	1	2	3
39. Changed something so things would turn out all right	0	1	2	3
40. Avoided being with people in general	0	1	2	3
41. Didn’t let it get to me; refused to think too much about it	0	1	2	3
42. I asked a relative or friend I respected for advice	0	1	2	3
43. Kept others form knowing how bad things were	0	1	2	3
44. Made light of the situation; refused to get too serious about it	0	1	2	3
45. Talked to someone about how I was feeling	0	1	2	3

	Not Used	Used Some What	Used Quite A Bit	Used A Great Deal
46. Stood my ground and fought for what I wanted	0	1	2	3
47. Took it out on other people	0	1	2	3
48. Drew on my past experiences; I was in a similar situation before	0	1	2	3
49. I knew what had to be done, so I doubled my efforts to make things work	0	1	2	3
50. Refused to believe that it had happened	0	1	2	3
51. I made a promise to myself that things would be different next time	0	1	2	3
52. Came up with a couple of different solutions to the problem	0	1	2	3
53. Accepted it, since nothing could be done	0	1	2	3
54. I tried to keep my feelings from interfering with other things too much	0	1	2	3
55. Wished that I could change what had happened or how I felt	0	1	2	3
56. I changed something about myself	0	1	2	3
57. I daydreamed or imagined a better time or place than the one I was in	0	1	2	3
58. Wished that the situation would go away or somehow be over with	0	1	2	3
59. Had fantasies or wishes about how things might turn out	0	1	2	3
60. I prayed	0	1	2	3
61. I prepared myself for the worst	0	1	2	3

	Not Used	Used Some What	Used Quite A Bit	Used A Great Deal
62. I went over in my mind what I would say or do	0	1	2	3
63. I though about how a person I admire would handle this situation and used that as a model	0	1	2	3
64. I tried to see things from the other person's point of view	0	1	2	3
65. I reminded myself how much worse things could be	0	1	2	3
66. I jogged or exercised	0	1	2	3

Appendix P

Coping Efficacy Scale

Appendix P

Coping Efficacy Scale

The questionnaire below asks you about how you feel you have coped with your diabetes in the past and how you feel you will be able to cope with your diabetes in the future. Please read each question and indicate your response by **circling** the appropriate choice.

1. Overall, how well do you think that the things you did during the last month worked to make your diabetes better?	Did not work at all	Worked a little	Worked pretty well	Worked very well
2. Overall, how well do you think that the things you did during the last month worked to make you feel better?	Did not work at all	Worked a little	Worked pretty well	Worked very well
3. Overall, how satisfied are you with the way you handled problems with your diabetes during the last month?	Not at all Satisfied	A little satisfied	Pretty well satisfied	Very satisfied
4. Overall, compared to other adults with diabetes, how good do you think that you have been in handling problems with your diabetes during the last month?	Not at all good	A little good	Pretty good	Very good
5. In the future, how good do you think that you will usually be in handling problems with your diabetes?	Not at all good	A little good	Pretty good	Very good
6. Overall, how good do you think you will be at making things better when problems with your diabetes come up in the future?	Not at all good	A little good	Pretty good	Very good
7. Overall, how good do you think you will be at handling your feelings when problems with your diabetes come up in the future?	Not at all good	A little good	Pretty good	Very good

Appendix Q

Letter of Permission

Appendix Q

From:
Irwin Sandler <irwin.sandler@asu.edu> Add to Address Book

Date:
2005/02/24 Thu AM 02:07:22 EST

To:
hartrish@bellsouth.net

Subject:
RE: FW: Coping Efficacy

I believe there are adult scales - see papers by Alex Zautra – If you can't find any, it's ok to adapt my measure.
Irwin

-----Original Message-----
From: hartrish@bellsouth.net [mailto:hartrish@bellsouth.net]
Sent: Wednesday, February 23, 2005 5:09 PM
To: Irwin Sandler
Subject: Re: FW: Coping Efficacy

Dr Sandler
Thanks for the questionnaire. Do you know of a coping efficacy scale that has been used with an adult population? I have searched and have been unable to find one that measures the coping efficacy concept except for yours.

Also, would you be open if I modify the questionnaire for adults with diabetes, with your permission, if I am not able to find a questionnaire that meets my needs for my study? I would have to do a pilot to test psychometrics with the changes.
Tricia

Appendix R

Summary of Diabetes Self-Care Activities Questionnaire

Appendix R

Summary of Diabetes Self-Care Activities Questionnaire

The questionnaire below asks you about your diabetes self-care activities during the past 7 days. If you were sick during the past 7 days, please think back to the last 7 days that you were not sick. **Circle** the appropriate response for each question.

Diet	**Days**							
1. How many of the last **SEVEN DAYS** have you followed a healthful eating plan?	0	1	2	3	4	5	6	7
2. On average, over the past month, how many **DAYS PER WEEK** have you followed your eating plan?	0	1	2	3	4	5	6	7
3. On how many of the last **SEVEN DAYS** did you eat five or more servings of fruits and vegetables?	0	1	2	3	4	5	6	7
4. On how many of the last **SEVEN DAYS** did you eat high fat foods such as red meat or full-fat dairy products?	0	1	2	3	4	5	6	7
Exercise	**Days**							
1. On how many of the last **SEVEN DAYS** did you participate in at least 30 minutes of physical activity? (Total minutes of continuous activity, including walking)	0	1	2	3	4	5	6	7
2. On how many of the last **SEVEN DAYS** did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or part of your work?	0	1	2	3	4	5	6	7

Blood Sugar Testing	**Days**							
1. On how many of the last **SEVEN DAYS** did you test your blood sugar?	0	1	2	3	4	5	6	7
2. On how many of the last **SEVEN DAYS** did you test your blood sugar the number of times recommended by your health care provider?	0	1	2	3	4	5	6	7

Foot Care	**Days**							
1. On how many of the last **SEVEN DAYS** did you check your feet?	0	1	2	3	4	5	6	7
2. On how many of the last **SEVEN DAYS** did you inspect the inside of your shoes?	0	1	2	3	4	5	6	7

Smoking	**Days**	
1. Have you smoked a cigarette-even one puff-during the past **SEVEN DAYS**?	NO	YES
2. If yes, how many cigarettes did you smoke on an average day?	Number of cigarettes: _____	

Medication		**Days**							
1. On how many of the last **SEVEN DAYS** did you take your recommended diabetes medications?	I do not take any diabetes medications	0	1	2	3	4	5	6	7

Appendix S

Georgia State University IRB Approval

Appendix S

Georgia State University IRB Approval Letter and Amendments

INSTITUTIONAL REVIEW BOARD

Mail: P.O. Box 3999
Atlanta, Georgia 30302-3999

In Person: Alumni Hall
30 Courtland St, Suite 217

Phone: 404/463-0674
Fax: 404/654-5838

July 28, 2005

Principal Investigator: Grindel, Cecelia Marie

Student PI: Patricia Hart

Principal Investigator Department: B.F. Lewis School of Nursing

Protocol Title: Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes: Pilot Study

Submission Type: Protocol H06004

Review Type: Expedited Review

Approval Date: July 28, 2005

Expiration Date: July 27, 2006

The Georgia State University Institutional Review Board (IRB) reviewed and approved the above referenced study and enclosed Informed Consent Document(s) in accordance with the Department of Health and Human Services. The approval period is listed above.

Federal regulations require researchers to follow specific procedures in a timely manner. For the protection of all concerned, the IRB calls your attention to the following obligations that you have as Principal Investigator of this study.

1. When the study is completed, a Study Closure Report must be submitted to the IRB.

2. For any research that is conducted beyond the one-year approval period, you must submit a Renewal Application 30 days prior to the approval period expiration. As a courtesy, an email reminder is sent to the Principal Investigator approximately two months prior to the expiration of the study. However, failure to receive an email reminder does not negate your responsibility to submit a Renewal Application. In addition, failure to return the Renewal Application by its due date must result in an automatic termination of this study. Reinstatement can only be granted following resubmission of the study to the IRB.

3. Any adverse event or problem occurring as a result of participation in this study must be reported immediately to the IRB using the Adverse Event Form.

4. Principal investigators are responsible for ensuring that informed consent is obtained and that no human subject will be involved in the research prior to obtaining informed consent. Ensure that each person signing the written informed consent form (ICF) is given a copy of the ICF. The ICF used must be the one reviewed and approved by the IRB; the approval dates of the IRB review are stamped on each page of the ICF. Copy and use the stamped ICF for the coming year. Maintain a single copy of the approved ICF in your files for this study.

All of the above referenced forms are available online at https://irbwise.gsu.edu. Please do not hesitate to contact Susan Vogtner in the Office of Research Integrity (404-463-0674) if you have any questions or concerns.

Sincerely,

Ann C. Kruger, IRB Chair

Federal Wide Assurance Number: 00000129

INSTITUTIONAL REVIEW BOARD

Mail: P.O. Box 3999
Atlanta, Georgia 30302-3999
In Person: Alumni Hall
30 Courtland St, Suite 217
Phone: 404/463-0674
Fax: 404/654-5838

January 26, 2006

Principal Investigator: Grindel, Cecelia Marie

Principal Investigator Department: B.F. Lewis School of Nursing Protocol Title: Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes: Pilot Study

Submission Type: Amendment #1 for H06004

Review Type: Expedited Review

Approval Date: July 28, 2005

Expiration Date: July 27, 2006

The Georgia State University Institutional Review Board reviewed and **approved** your amendment to your above referenced Protocol. This amendment includes several changes to make change it from the pilot study to the full study.

This approval period is listed above and must be renewed at least 30 days before the expiration date if research is to continue beyond that time frame. Renewal proposals may be resubmitted in abbreviated form.

Any adverse reactions or problems resulting from this investigation must be reported immediately to the University Institutional Review Board. For more information, see the hand out on IRB procedures available from the Research Office.

For more information visit our website at www.gsu.edu/irb.

Sincerely,

Ann C. Kruger, IRB Chair

Federal Wide Assurance Number: 00000129

INSTITUTIONAL REVIEW BOARD

Mail: P.O. Box 3999
Atlanta, Georgia 30302-3999
In Person: Alumni Hall
30 Courtland St, Suite 217
Phone: 404/463-0674
Fax: 404/654-5838

February 14, 2006

Principal Investigator: Grindel, Cecelia Marie

Protocol Department: College of Health & Human Science

Principal Investigator Department: B.F. Lewis School of Nursing

Protocol Title: Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes: Pilot Study

Submission Type: Amendment #2 for H06004

Review Type: Expedited Review

Approval Date: July 28, 2005
Expiration Date: July 27, 2006

The Georgia State University Institutional Review Board reviewed and **approved** your amendment to your above referenced Protocol. This amendment includes adding a site.

This approval period is listed above and must be renewed at least 30 days before the expiration date if research is to continue beyond that time frame. Renewal proposals may be resubmitted in abbreviated form.

Any adverse reactions or problems resulting from this investigation must be reported immediately to the University Institutional Review Board. For more information, see the hand out on IRB procedures available from the Research Office.

For more information visit our website at www.gsu.edu/irb.

Sincerely,

Ann C. Kruger, IRB Chair

Federal Wide Assurance Number: 00000129

INSTITUTIONAL REVIEW BOARD

Mail: P.O. Box 3999
Atlanta, Georgia 30302-3999

In Person: Alumni Hall
30 Courtland St, Suite 217

Phone: 404/463-0674
Fax: 404/654-5838

March 13, 2006

Principal Investigator: Grindel, Cecelia Marie

Protocol Department: College of Health & Human Science

Protocol Title: Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes: Pilot Study

Submission Type: Amendment #3 for H06004

Review Type: Expedited Review

Approval Date: July 28, 2005

Expiration Date: July 27, 2006

The Georgia State University Institutional Review Board reviewed and **approved** your amendment to your above referenced Protocol. This amendment includes adding a site, adding an incentive, and modifying the consent form.

This approval period is listed above and must be renewed at least 30 days before the expiration date if research is to continue beyond that time frame. Renewal proposals may be resubmitted in abbreviated form.

Any adverse reactions or problems resulting from this investigation must be reported immediately to the University Institutional Review Board. For more information, see the hand out on IRB procedures available from the Research Office.

For more information visit our website at www.gsu.edu/irb.

Sincerely,

Ann C. Kruger, IRB Chair

Federal Wide Assurance Number: 00000129

INSTITUTIONAL REVIEW BOARD

Mail: P.O. Box 3999
Atlanta, Georgia 30302-3999
In Person: Alumni Hall
30 Courtland St, Suite 217
Phone: 404/463-0674
Fax: 404/654-5838

April 5, 2006

Principal Investigator: Grindel, Cecelia Marie

Protocol Department: College of Health & Human Science

Protocol Title: Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes: Pilot Study

Submission Type: Amendment #4 for H06004

Review Type: Expedited Review

Approval Date: July 28, 2005

Expiration Date: July 27, 2006

The Georgia State University Institutional Review Board reviewed and **approved** your amendment to your above referenced Protocol. This amendment includes adding a site and a consent form specific to that site.

This approval period is listed above and must be renewed at least 30 days before the expiration date if research is to continue beyond that time frame. Renewal proposals may be resubmitted in abbreviated form.

Any adverse reactions or problems resulting from this investigation must be reported immediately to the University Institutional Review Board. For more information, see the hand out on IRB procedures available from the Research Office.

For more information visit our website at www.gsu.edu/irb.

Sincerely,

Ann C. Kruger, IRB Chair

Federal Wide Assurance Number: 00000129

INSTITUTIONAL REVIEW BOARD

Mail: P.O. Box 3999
Atlanta, Georgia 30302-3999

In Person: Alumni Hall
30 Courtland St, Suite 217

Phone: 404/463-0674
Fax: 404/654-5838

April 12, 2006

Principal Investigator: Grindel, Cecelia Marie

Protocol Department: College of Health & Human Science

Protocol Title: Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes: Pilot Study

Submission Type: Amendment #5 for H06004

Review Type: Expedited Review

Approval Date: July 28, 2005

Expiration Date: July 27, 2006

The Georgia State University Institutional Review Board reviewed and **approved** your amendment to your above referenced Protocol. This amendment includes adding 3 recruitment sites.

This approval period is listed above and must be renewed at least 30 days before the expiration date if research is to continue beyond that time frame. Renewal proposals may be resubmitted in abbreviated form.

Any adverse reactions or problems resulting from this investigation must be reported immediately to the University Institutional Review Board. For more information, see the hand out on IRB procedures available from the Research Office.

For more information visit our website at www.gsu.edu/irb.

Sincerely,

Ann C. Kruger, IRB Chair

Federal Wide Assurance Number: 00000129

INSTITUTIONAL REVIEW BOARD

Mail: P.O. Box 3999
Atlanta, Georgia 30302-3999

In Person: Alumni Hall
30 Courtland St, Suite 217

Phone: 404/463-0674
Fax: 404/654-5838

June 28, 2006

Principal Investigator: Grindel, Cecelia Marie

College: Health & Human Sciences

Department: B.F. Lewis School of Nursing

Protocol Title: Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes: Pilot Study

Funding Agency:

Submission Type: Continuing Review #1 for H06004

Review Type: Expedited Review

Approval Date: June 28, 2006

Expiration Date: June 27, 2007

The Georgia State University Institutional Review Board (IRB) reviewed and approved the above referenced study and enclosed Informed Consent Document(s) in accordance with the Department of Health and Human Services. The approval period is listed above.

Federal regulations require researchers to follow specific procedures in a timely manner. For the protection of all concerned, the IRB calls your attention to the following obligations that you have as Principal Investigator of this study.

4. When the study is completed, a Study Closure Report must be submitted to the IRB.

5. For any research that is conducted beyond the one-year approval period, you must submit a Renewal Application 30 days prior to the approval period expiration. As a courtesy, an email reminder is sent to the Principal Investigator approximately two months prior to the expiration of the study. However, failure to receive an email reminder does not negate your responsibility to submit a Renewal Application. In addition, failure to return the Renewal Application by its due date must result in an automatic termination of this study. Reinstatement can only be granted following resubmission of the study to the IRB.

6. Any adverse event or problem occurring as a result of participation in this study must be reported immediately to the IRB using the Adverse Event Form.

4. Principal investigators are responsible for ensuring that informed consent is obtained and that no human subject will be involved in the research prior to obtaining informed consent. Ensure that each person signing the written informed consent form (ICF) is given a copy of the ICF. The ICF used must be the one reviewed and approved by the IRB; the approval dates of the IRB review are stamped on each page of the ICF. Copy and use the stamped ICF for the coming year. Maintain a single copy of the approved ICF in your files for this study.

All of the above referenced forms are available online at https://irbwise.gsu.edu. Please do not hesitate to contact Susan Vogtner in the Office of Research Integrity (404-463-0674) if you have any questions or concerns.

Sincerely,

Ann C. Kruger, IRB Chair

Federal Wide Assurance Number: 00000129

Appendix T

Saint Joseph's Hospital IRB Approval

Appendix T

Saint Joseph's Hospital IRB Approval Letter

SAINT JOSEPH'S
Caring for Atlanta 125 YEARS

27 March 2006

Patricia Hart, PhD(c), RN, MS
5181 Marsden Trace
Powder Springs, GA 30127

RE: NOTIFICATION OF PROTOCOL APPROVAL
PI: Patricia Hart, PhD(c), RN, MS
IRB #: 017-06
TITLE: Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes

Protocol Review Date: 3/22/06

The following items were reviewed:
Protocol H06004#4
Informed Consent dated 3/15/06

The Saint Joseph's Hospital of Atlanta, Inc., Institutional Review Board (IRB) #2 has reviewed the above-referenced items and the associated informed consent process. In compliance with Federal Regulations [21 CFR 56.109 (e); 45 CFR 46.109 (d)] this letter serves as your written notification of the IRB's determination.

This approval is valid from 3/22/06 to 3/21/07

Approval of this protocol is based on your agreement to abide by the policies and procedures of the St. Joseph's Hospital System regarding research and to keep appropriate records concerning your patients. Any serious reactions resulting from this study should be reported immediately to the IRB and to the sponsor.

IRB approval is required prior to implementing any changes or amendments in the protocol, regardless how minor, except to eliminate apparent immediate hazards to subjects. No changes to the informed consent document may be made without prior IRB review and approval.

The initial approval period is noted above. Continued approval is contingent upon the submission of a renewal application **no later than 60 days prior to the expiry date** listed above. Failure to submit the renewal notice in a timely fashion may result in the expiration and subsequent administrative withdrawal of the protocol. You will not be able to reactivate the protocol once it has been withdrawn.

Failure to receive notification from the IRB Office will not relieve you of your responsibility to ensure compliance with Federal Regulations regarding annual review [21 CFR 56.109 (f); 45 CFR 46.109 (e)].

Please note that the protocol has been assigned an IRB number. All inquires and correspondence concerning this protocol must include 1) the above-referenced IRB number, 2) name of the Principal Investigator and 3) full title of the study.

If you have any questions or concerns, please contact the IRB office, at (404) 851-5703 or via irb@sjha.org.

Sincerely,

Andrea Roberson, PharmD
Vice-Chairman, Institutional Review Board
AR/km

INSTITUTIONAL REVIEW BOARD
5673 PEACHTREE DUNWOODY ROAD, N.E., SUITE 685, ATLANTA, GEORGIA 30342 • 404-851-5703 • FAX: 404-851-4939

Appendix U

Nursing Research Committee Letter of Approval

Appendix U

WellStar Health System Nursing Research Committee Approval Letter

WELLSTAR
Health System

January 23, 2006

Dear Ms. Hart,

Study Title: Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes

Study Number: 06-01

Thank you for presenting your research proposal to the WellStar Nursing Research Committee.

The Committee has reviewed your proposal and has no recommendations for revisions. This is to confirm that your application has been approved pending receipt of IRB approval from Georgia State University. A copy of the IRB approval must be submitted to me via email or fax prior to beginning your study.

Please contact me if you have any questions or need additional information.

Sincerely,

Danielle Fraser, MS, RN, CNS-BC

Danielle Fraser, MS, RN, CNS-BC
Chair, WellStar Nursing Research Committee
Phone: 770-793-5221
Fax: 770-793-7894
Pager: 770-223-5922
Email: danielle.fraser@wellstar.org

Appendix V

Nursing Research Committee Letter of Approval

Appendix V

Piedmont Hospital Nursing Research Committee Approval Letter

Ms. Hart,

Your research proposal entitled ILLNESS REPRESENTATION, EMOTIONAL DISTRESS, COPING STRATEGIES, AND
COPING EFFICACY AS PREDICTORS OF OUTCOMES IN TYPE 2 DIABETES has been approved by the Nursing
Research Committee of Piedmont Hospital. The NRC will serve as an oversight committee for the
Hospital IRB during the data collection phase of your study. Mary Ransbotham will be your site
contact person during the conduction of your study.

Attached is your official approval letter from the NRC. In addition I have attached the final
report form that is to be completed and submitted to the NRC once you have completed your study.

We are pleased that you are using Piedmont Hospital as one of your sites for data collection. Feel
free to contact me or Mary Ransbotham should you have any questions. Good luck with your research
endeavor.

Pam Cowart RN, MSN, CCNS
Clinical Nurse Specialist
NRC Chairperson
Piedmont Hospital/Fuqua Heart Center
Heart Failure Resource Center
404.605.1732
pam.cowart@piedmont.org

Appendix W

Informed Consent Document

Appendix W

BYRDINE F. LEWIS SCHOOL OF NURSING
College of Health and Human Sciences

PO Box 4019
Atlanta, GA 30802-4019
Phone: 404/651-3040
Fax: 404/651-3096

Informed Consent Form

Title: Illness Representation, Emotional distress, Coping Strategies, and Coping Efficacy as Predicators of Outcomes in Type 2 Diabetes

Principal Investigator: Cecelia Grindel, PhD, RN
Student Investigator: Patricia Hart, MS, PhD(c), RN

My name is Patricia Hart. I am a nurse working on a graduate degree at Georgia State University. I am seeking people with type 2 diabetes to take part in a research study. The purposes of this research study are to explore:

1. how people with type 2 diabetes view their illness
2. the emotions people go through with diabetes
3. how people cope with their diabetes, and
4. how these factors affect their blood sugar levels as well as how they care for their diabetes

I am seeking 150 men and women to take part in this study. You were selected as a likely person because you have had type 2 diabetes for at least 1 year or more, are 18 years of age or older, and have had an A1c level drawn within the past 30 days.

Procedures: The study consists of you completing 5 questionnaires in a booklet. It should take you about 30 minutes to complete the questionnaires. The first questionnaire includes questions about yourself such as age, education, and duration of your diabetes. The second questionnaire looks at how you view your diabetes. The third questionnaire looks at how you cope with your diabetes. The fourth questionnaire looks at how well you feel you have coped with your diabetes in the past and how you think you will be able to cope with your diabetes in the future. The fifth questionnaire looks at your participation with self-care activities. I will also need to obtain your last hemoglobin A1c level from your medical record at your physician office.

Compensation: You will be paid a $10.00 gift card from CVS or Eckerd or Walgreens Drug store for your particpation in this study with the completion and return of the questionnaire booklet.

BYRDINE F. LEWIS SCHOOL OF NURSING
College of Health and Human Sciences

PO Box 4019
Atlanta, GA 30802-4019
Phone: 404/651-3040
Fax: 404/651-3096

Risks: There is no physical risk for taking part in this study. There is a slight risk of feeling uneasy as you think about your illness. You may go through some uneasy feelings by answering the questionnaires and thinking about how your type 2 diabetes is affecting your life. Your physician or healthcare provider will be available to address any uneasy feelings you have from taking part in this study. Your physician or healthcare provider will provide referrals to other healthcare providers if needed.

Benefits: There may be no direct benefit to you for taking part in this research. It is possible that you may gain a better insight into your diabetes because of thinking about living with diabetes.

This research may be of use to the public because it may give insight into what effects people to care for their diabetes.

This research may assist health care providers to find ways to help inspire people to take correct actions to care for their diabetes. Inspiring people to take care of their diabetes may reduce acute and chronic complications of diabetes. This may lead to a better quality of life.

Voluntary Participation and Withdrawal: Participation in research is voluntary. You have the right to refuse to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or discontinue participation at any time. However, any information already used to the point when you withdraw consent will not be removed. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

Confidentiality: I will try to keep your personal information private. Your privacy will be kept to the extent allowed by law. I will remove all information that can identify you. I will share it with other people involved in this research study. If you decide you want to be in this study it means that you agree to let me use and share your personal health information for reasons I have listed in this Consent Form.

While I am doing this research I may use only the personal health information that you have given me: (your name, address, birth date, A1c level). I will be the only person looking at your personal health information. I will look at it so I can work on this research study. I may also share your health information with the Georgia State University Institutional Review Board (IRB) and my advisor, Dr

BYRDINE F. LEWIS SCHOOL OF NURSING
College of Health and Human Sciences

PO Box 4019
Atlanta, GA 30802-4019
Phone: 404/651-3040
Fax: 404/651-3096

Cecelia Grindel. Your personal health information may be shared by the people or places I have listed, but it will be shared in a way that does not fall under the protection of federal regulations that apply to the privacy of health information.

If you sign this consent form you are letting me use your personal health information until the end of this study. You have the right to say that you do not want me to use your personal health information after I have collected it. If you decide you don't want me to use your information anymore, you must write a letter asking me not to use your information. You will need to send the letter to the investigator (Patricia Hart) who received your completed questionnaire. This will be the only person who will be able to know which questionnaire is yours. I want to let you know that because the questionnaires do not have your name or address on them, I might not know which questionnaire is yours. If you don't want me to use your information anymore, I will stop using it, but any information that I have already used in the study will not be removed.

You may not be able to look at or get a copy of your health information that you gave me while I am doing the research; however you will be able to look at or get a copy at the end of the study.

This research may be shown to other researchers in an aggregate format without identifying you. This research may be published, but steps will be taken to make sure that you cannot be identified.

If you have any question about this study, or believe you have suffered any injury because of participation in the study, you may contact Patricia Hart, MS, PhD(c), RN at 770-427-2544. Your personal physician will make available or arrange for appropriate management and treatment for any physical or psychological injury resulting from this study. Georgia State University, however, has not set aside funds to pay for this care or to compensate you if something should occur.

Contact Person: Call Patricia Hart, MS, PhD(c), RN at 770-427-2544 if you have questions about this study.

If you have questions or concerns about your rights as a participant in this research study, you may contact the Institutional Review Board (IRB) which oversees the protection of human research participants. Susan Vogtner, in the Office of Research Integrity, can be reached at 404-463-0674.

We will give you a copy of this consent form to keep.

If you are willing to volunteer for this research, please sign below.

_____	_____
Participant's Signature	Date
_____	_____
Participant's Name (Print)	Date
_____	_____
Investigator's or Designee's Signature	Date

Appendix X

Hospital Informed Consent Document

Appendix X

SAINT JOSEPH'S
Institutional Review Board
IRB # 017-06
ICF Approved from 3/22/06 to 3/21/07

INSTITUTIONAL REVIEW BOARD of
SAINT JOSEPH'S HOSPTIAL OF ATLANTA, INC.

CONSENT FORM TO PARTICIPATE IN RESEARCH
(DO NOT SIGN WITHOUT READING THE CONTENTS)

Title: Illness Representation, Emotional distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes

Principal Investigator: Patricia Hart, MS, PhD(c), RN
Faculty Advisor: Cecelia Grindel, PhD, RN

Sponsor Information:
Georgia State University
Byrdine F. Lewis School of Nursing
College of Health and Human Sciences
PO Box 4019
Atlanta, GA 30802-4019
Phone: 404/651-3040

My name is Patricia Hart. I am a nurse working on a graduate degree at Georgia State University. I am seeking people with type 2 diabetes to take part in a research study. The purposes of this research study are to explore:

1. how people with type 2 diabetes view their illness
2. the emotions people go through with diabetes
3. how people cope with their diabetes, and
4. how these factors affect their blood sugar levels as well as how they care for their diabetes

I am seeking 150 men and women to take part in this study. You were selected as a likely person because you have had type 2 diabetes for at least 1 year or more, are 18 years of age or older, and have had an A1c level drawn within the past 30 days.

Procedures: The study consists of you completing 5 questionnaires in a booklet. It should take you about 30 minutes to complete the questionnaires. The first questionnaire includes questions about yourself such as age, education, and duration of your diabetes. The second questionnaire looks at how you view your diabetes. The third questionnaire looks at how you cope with your diabetes. The fourth questionnaire looks at how well you feel you have coped with your diabetes in the past and how you think you will be able to cope with your diabetes in the future. The fifth questionnaire looks at your participation with self-care activities. I will also need to obtain your last hemoglobin A1c level from your medical record.

3/15/2006 Initials of Participant _____

Compensation: You will be paid a $10.00 gift card from CVS or Eckerd or Walgreens Drug store for your particpation in this study with the completion and return of the questionnaire booklet. All or part of this research may be financed by the research sponsor or manufacturer. You have a right to ask about this funding.

Risks: There is no physical risk for taking part in this study. There is a slight risk of feeling uneasy as you think about your illness. You may go through some uneasy feelings by answering the questionnaires and thinking about how your type 2 diabetes is affecting your life. Your physician or healthcare provider will be available to address any uneasy feelings you have from taking part in this study. Your physician or healthcare provider will provide referrals to other healthcare providers if needed.

Benefits: There may be no direct benefit to you for taking part in this research. It is possible that you may gain a better insight into your diabetes because of thinking about living with diabetes.

This research may be of use to the public because it may give insight into what motivates people to care for their diabetes.

This research may assist health care providers to find ways to help inspire people to take correct actions to care for their diabetes. Inspiring people to take care of their diabetes may reduce acute and chronic complications of diabetes. This may lead to a better quality of life.

Voluntary Participation and Withdrawal: Participation in research is voluntary. You have the right to refuse to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or discontinue participation at any time. However, any information already used to the point when you withdraw consent will not be removed. Whatever you decide, you will not lose any benefits to which you are otherwise entitled. If you withdraw from the Research Study, or refuse to participate in the Research Study, it will not affect your access to health care or treatment from your physician. You may ask questions about the Research Study at any time. You may receive information about your rights as a research participant from the Institutional Review Board ("IRB") of Saint Joseph's Hospital of Atlanta, Inc. at 404-851-5703.

I have received a copy of this research consent form.

____ YES (Initials) **____NO (Initials)**

All my questions have been answered to my satisfaction.

____ YES (Initials) **____NO (Initials)**

SAINT JOSEPH'S
Institutional Review Board
IRB # 017-06
ICF Approved from 3/22/06 to 3/21/07

Confidentiality and Authorization to Use and Disclose Health Information: Any information obtained, as a result of your participation in this research will be kept as confidential as legally possible. Federal laws require that your privacy, security, and unauthorized access to your health information be protected.

I agree to permit Saint Joseph's Hospital of Atlanta, Inc. its agents and subcontractors, my doctors, and my other care providers, (together "Providers"), Gerogia State University Instititional Review Board, its agents and subcontractors, and Patricia Hart, MS, PhD(c), RN ("Principal Investigator") to use and disclose health information about me as described below.

1. The health information that may be used and disclosed includes:
   - All information collected during the research described in the Informed Consent Form for the study entitled, "Illness Representation, Emotional Distress, Coping Strategies, and Coping Efficacy as Predictors of Outcomes in Type 2 Diabetes," and,
   - Information that can identify me, including but not limited to my initials, name, birth date and address; and,
   - Health information in my medical records that is relevant to the Research, including, my A1c level from my laboratory reports.

2. The Providers may disclose health information in my medical records to:
   - The Researchers
   - The sponsor of the Research, Georgia State University Institutional Review Board, its agents and subcontractors, and,
   - Representatives of government agencies including the Food and Drug Administration, the Department of Health and Human Services, review boards including the Saint Joseph's Hospital of Atlanta, Inc., Institutional Review Board, its agents and subcontractors, Georgia State University Institutional Review Board, its agents and subcontractors and other persons who watch over the safety, effectiveness, and conduct of research.

3. The Researchers may use and share my health information:
   - Among themselves and with other participating researchers to conduct the Research; and,
   - As permitted by the Informed Consent Form; and,
   - With Georgia State University Institutional Review Board, its agents and subcontractors; and,
   - Representatives of government agencies, including the Food and Drug Administration, review boards, including the Saint Joseph's Hospital of Atlanta, Inc., Institutional Review Board, its agents and subcontractors, Georgia State University Institutional Review Board, its agents and subcontractors; and,
   - With my Providers.

4. The Sponsor may use and share my health information as permitted by the Informed Consent Form.

5. Once my health information has been disclosed to a third party by any of the parties above, it may be further disclosed under federal privacy laws and Saint Joseph's, and other providers can not promise my privacy will always be protected. Federal privacy laws may no longer protect it from further disclosure.

6. I acknowledge that:

   - I do not have to sign this Authorization, but if I do not, I may not participate in the Research.
   - I may change my mind and revoke (take back or withdraw) this Authorization at any time and for any reason. To revoke this Authorization, I must write to Patricia Hart, MS, PhD(c), RN, PO Box 801366, Acworth, Georgia, 30101-9997. However, if I revoke this Authorization, I will not be allowed to continue taking part in the Research, but I will still be able to receive medical care from my doctor. Also, even if I revoke this Authorization, the Providers, Researchers and Sponsor and other parties above may continue to use and disclose the information they previously collected as permitted by the Informed Consent Form. Health information that has already been sent to the Sponsor can not be taken back.
   - To maintain the integrity of this research study, I generally will not have access to my health information related to this research until the study is complete. At the conclusion of the research and at my request, I generally will have access to my health information that is maintained in a designated record set for a period of 7 years. At the end of 7 years, all information will be destroyed by the researchers.
   - If I have not already received the Saint Joseph's Hospital of Atlanta, Inc. Notice of Privacy Practices, the research team will give me a copy upon request.
   - If all information that does or can identify me is removed from my health information, the remaining information will no longer be subject to this Authorization and may be used or disclosed for other purposes.
   - My health information will be used or disclosed when required by law.
   - If I have questions about the use of my information, I can call Patricia Hart, MS, PhD(c), RN at 770-427-2544 (Principal Investigator) or the Saint Joseph's Hospital of Atlanta, Inc. Privacy Officer at 404-851-7732.

7. This Authorization does not have an expiration (ending) date.

8. I will be given a copy of this Authorization after I have signed it.

Signature of Participant	Date
Name of Person Obtaining Consent	Date
Signature of Investigator	Date
Print Name of Investigator	