ABSTRACT

EMPOWERMENT, SOCIAL SUPPORT, AND GLYCEMIC CONTROL: DOES A RELATIONSHIP EXIST?

By Lynne Derezinski

Type 1 diabetes mellitus accounts for approximately 5% to 10% of diagnosed diabetes in the United States according to the National Institute of Health. Diabetes is associated with long-term complications that affect numerous organs of the body. The occurrence of complications from type 1 diabetes mellitus can be lowered by controlling blood glucose levels.

To actively engage the patient in the treatment process, providers should focus patient education strategies on empowerment by facilitating the development of self-management capabilities. Social support, which has been shown to be an important factor in a patient's quality of life, also may affect patient self-care and diabetes outcomes. The purpose of this study was to identify whether a relationship exists among empowerment, social support, and glycemic control in adult patients with type 1 diabetes mellitus.

The researcher utilized Orem's Self-Care Model to conduct a descriptive, correlational study with a convenience sample of adult type 1 diabetics from a central Wisconsin clinic. Through three questionnaires -- demographics including glycosylated hemoglobin (HbA1c) levels, the Diabetes Empowerment Scale Short Form (DES-SF), and Norbeck's Social Support Questionnaire (NSSQ) -- data was analyzed with correlational and descriptive statistics.

Using a Pearson r, no significant correlation existed between empowerment and HbA1c ($r = 0.390$, $p = 0.388$) or total functional support and HbA1c ($r = -0.677$, $p = 0.140$). There was an inverse relationship between empowerment and total functional support ($r = -0.868$, $p = 0.025$).

EMPOWERMENT, SOCIAL SUPPORT, AND GLYCEMIC CONTROL: DOES A RELATIONSHIP EXIST?

by

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CHAPTER I

INTRODUCTION

Type 1 diabetes mellitus (DM) is an autoimmune disease affecting pancreatic ability to produce insulin, resulting in the need for daily subcutaneous insulin injections or insulin administration via pump. Presently, the cause of type 1 DM is unknown, but researchers believe that autoimmune, genetic, and environmental factors, including a viral etiology, are involved (King, 2003; National Institutes of Health [NIH], n. d.). Type 1 DM, mostly developing in childhood or young adulthood, accounts for 5% to 10% of the population with DM, occurring equally in males and females, and is more common in the White population. Diabetes is widely recognized as one of the leading causes of death and disability in the United States and is associated with long-term complications, such as blindness, neurovascular disease, heart disease, cerebrovascular accident, renal failure, and amputation (NIH, n.d., American Diabetes Association, n.d.). By maintaining tight control of glucose levels, patients with type 1 DM can prevent or lessen complications (The Diabetes Control and Complications Trial [DCCT] Research Group, 1993).

According to Funnell and Anderson (2000), more than 95% of diabetes care is done by the patient, with little contact or management assistance from providers between office visits.   Since DM pervades all aspects of a person’s life, they themselves must undertake the management of the disease (Aalto, Uutela, & Aro, 1997; Coates & Boore, 1998; Funnel et al., 2007; Henshaw, 2006; Hill, 2003; Shiu, Martin, Thompson, & Wong, 2005; NIH, n.d.). Management of type 1 DM is based on the person’s own goals, priorities, health issues, family demands, and other personal issues. “For diabetes care to succeed, patients must be able to make informed decisions about how they will live with their illness" (Funnell & Anderson, 2000, p. 1709). Patients with type 1 DM should be acknowledged as experts in their own lives; however, for effective lifetime management of DM, provider support may be needed to facilitate the knowledge, skill, and ability necessary for diabetes self-care (Coates & Boore, 1998; Funnell & Anderson; 2000; Funnell et al., 2007).

Empowerment, Social Support, and Self-Efficacy

Empowerment is defined as a "process by which individuals and groups gain power, access to resources and control over their own lives. In doing so, they gain the ability to achieve their highest personal and collective aspirations and goals" (Robbins, Chatterjee, & Canda, 1998, p. 91). Empowerment is an ideal outcome of diabetes education and management. "Patients are empowered when they have the knowledge, skills, attitudes, and self-awareness necessary to influence their own behavior and that of others to improve the quality of their lives" (Funnell & Anderson, 2003, p. 454).

Social support influences treatment adherence of patients with chronic illness (Sayers, Riegel, Pawlowski, Coyne, & Samaha, 2008; Trief, Ploutz-Snyder, Britton, & Weinstock, 2004). By recognizing that patients with DM make behavioral changes in a social context, social support is identified as a mechanism to successfully make and maintain changes (Trief et al., 2004). Social support, which is related to coping, can have negative and positive effects on health outcomes. Support may involve knowledge or assistance with coping strategies or provision of material goods. Aalto et al. (1997) concluded that the most important factors involved in patient quality of life were positive social support and patient self-efficacy, an element of empowerment. Self-efficacy is defined as the confidence an individual has to make decisions and carry out self-management. Self-efficacy increases when the individual is empowered (Henshaw, 2006). As a result of empowerment, the patient will have increased self-efficacy and ability to set and reach goals and have improved self-esteem (Sigurdardottir & Jonsdottir, 2008).

Glycemic control is an important but complex aspect of diabetes management, with many factors necessary to maintain control (Coates & Boore, 1998; Rose, Fliege, Hildebrandt, Schirop, & Klapp, 2002; Shiu et al., 2005). According to Shiu et al. (2005), with the complexity involved in maintaining good glycemic control, "…in an adverse situation or environment, even the patient who is very empowered may be limited in making healthy choices" (p. 90). Empowerment alone was found to have no impact on glycemic control in adult type 1 and type 2 diabetics. A combination of strategies is necessary, such as social support and environmental change, to affect glycemic control. In many studies, empowerment or self-efficacy and social support are researched together, since such a strong correlation exists between them. Previous studies have focused on quality of life and adherence to treatment regimes (Aalto et al., 2000; Trief et al., 2004). With the small percentage of persons with type 1 DM compared to type 2 DM, many previous studies often focused on combining both types (Anderson, Funnell, Fitzgerald, & Marrero, 2000; Rose et al., 2002; Shiu et al., 2005; Trief et al., 2004). Research is limited in determining what relationship exists between empowerment, social support, and glycemic control in adult patients with type 1 DM.

Following a review of controlled intervention studies, researchers identified the need for further research, testing the effects of specific social support interventions on patient self-care, lifestyle adaptations, and outcomes of diabetes care (van Dam et al., 2005). The purpose of the current study was to explore the relationship among empowerment, social support, and glycemic control in adult patients with type 1 DM.

Significance to Nursing

The empowerment approach to diabetes education has led to recognition of relationships between patients and providers that are based on mutual expertise and responsibility (Diabetes Educator, n.d.). Providers' active support of patients' efforts results in commitment and self-motivation that ultimately leads to positive health outcomes (Funnell & Anderson, 2000). The process of diabetes self-management education (DSME) is guided by evidence-based standards that are ongoing, incorporating the needs, goals, and life experiences of the patient (Funnell et al., 2007). The objectives of the National Standards for DSME are "to support informed decision making, self-care behaviors, problem solving, and active collaboration with the health care team to improve clinical outcomes, health status, and quality of life" (Funnell et al., 2007, p. 599-600). Ongoing support is critical for patients to sustain progress.

Along with education to effectively manage diabetes mellitus, patients also need social support. According to Williams, Rodin, Ryan, Grolnick, and Deci (1998), autonomy support is defined as the degree to which healthcare providers and social support sources understand the patients' diabetes-related priorities and needs, acknowledge patients' feelings, provide meaningful self-management choices, offer relevant information, and avoid controlling patients' behavior. The focus is not on success or failure, compliance or noncompliance, but the learning that occurs as a result of self-care management. This learning from past experiences allows patients to gain insight into the barriers and supports they have and their need to make behavioral changes and ultimately to improve their ability to manage their own health. The opportunities to reflect on these experiences and solve problems that arise are crucial elements of the empowerment-based learning method. Providers should strive for open communication about social support, while employing the empowerment model of diabetes care, to improve glycemic control. This study identified potential factors that may lead to improvement in DM outcomes.

Purpose

The purpose of this study was to identify whether a relationship exists among empowerment, social support, and glycemic control in adult patients with type 1 diabetes mellitus.

Research Question

Does a relationship exist among empowerment, social support, and glycemic control in adult patients with type 1 diabetes mellitus?

Hypothesis

1. Participants with higher levels of diabetes empowerment will experience better glycemic control than those with lower levels of diabetes empowerment.
2. Participants with higher levels of social support will experience better glycemic control than those with lower levels of social support.

3. Participants with higher levels of both diabetes empowerment, and social support will experience better glycemic control than those with lower levels of both diabetes empowerment and social support.

Definitions of Terms

Conceptual Definitions

Type 1 diabetes mellitus: Diabetes mellitus refers to a group of metabolic diseases characterized by hyperglycemia as a result of defects in insulin secretion, insulin action or both (Gillibrand and Stevenson, 2006; American Diabetes Association, n.d.). Type 1 diabetes mellitus is an autoimmune disease during which the insulin-producing beta cells in the pancreas are destroyed by the immune system resulting in lack of insulin production (NIH, n. d.). Insulin administration is necessary for maintenance of life. Type 1 diabetes mellitus is diagnosed when actual insulin secretion is deficient and is confirmed by any one of the following test results, and confirmed by retest on more than one occasion: (a) an elevated fasting plasma glucose of greater than or equal to 126 mg/dL, (b) a random plasma glucose level of greater than or equal to 200 mg/dL along with symptoms of diabetes, or (c) a 2-hour post 75 gram oral glucose tolerance test (OGTT) with a plasma glucose level of greater than or equal to 200 mg/dL used when neither the fasting or random glucose levels are conclusive (King, 2003; Nicoll, McPhee, Pignone, & Lu, 2008; NIH, n.d.).

Empowerment: Empowerment is a dynamic and reciprocal process based on the assumption that to be healthy, people need to have the psychological skills to bring about changes in their personal behavior, their social situations, and the institutions that influence their lives. These skills play an important role in the development and implementation of a successful diabetes self-care plan, i.e., a plan that enhances the patient's health and quality of life (Anderson et al., 1995),

Social support: Interpersonal transactions which may include one or more of the following: the expression of positive affect of one person toward another; the affirmation or endorsement of another person's behaviors, perceptions, or expressed views; the giving of symbolic or tangible aid to another (Kahn, 1979 as cited in Norbeck, Lindsey, & Carrieri, 1981).

Glycemic control: Pre-prandial blood glucose concentrations between 70 and 120 mg/dL, postprandial concentrations of less than 180 mg/dL (DCCT, 1993) and HbA1c levels between 6.5% and 7.5%. HbA1c measures the amount of glucose that is bound to red blood cells during the previous 12-week timeframe providing an average rating of glycemic control and is a measure of long-term diabetes control (Hill, 2007).

Operational Definitions

Type 1 diabetes mellitus: Adults, both male and female, of any race, age 18 or above, who were diagnosed by their healthcare provider as having type 1 diabetes mellitus for 2 years or longer. Type 1 diabetes mellitus, as defined by International Classification of Diseases 9th edition (ICD-9) code, will be used for this study.

Empowerment: Psychological skills measured by the composite score on the 8-item Diabetes Empowerment Scale Short Form (Appendix A) (Michigan Diabetes Research and Training Center, n.d.).

Social support: Interpersonal transactions measured by the 9-item Norbeck's Social Support Questionnaire (Appendix B) (University of California, San Francisco, n.d.).

Glycemic control: HbA1c levels within the previous 12 months. In studies of diabetes, HbA1c levels are a standard measure of glycemic control (Gillibrand & Stevenson, 2006; Nicoll, McPhee, Pignone, & Lu, 2008). According to American Diabetes Association guidelines, glycemic control is identified by an HbA1c level of less than 7% (American Diabetes Association, 2009).

Assumptions

1. Participants provide honest and accurate responses.
2. Participants will possess the ability to read and write in the English language.
3. Participants comprehend the goal of long-term diabetes mellitus treatment is glycemic control.
4. According to Orem's Self-Care Model, participants require continuous, deliberate inputs to themselves and their environment to remain alive and functional (Comley, 1994).
5. According to Orem's Self-Care Model, participants possess the power to act deliberately, in the form of self-care, by identifying needs and making inputs (Comley, 1994).
6. According to Orem's Self-Care Model, participants may experience limitations in their ability to provide self-care (Comley, 1994).
7. According to Orem's Self-Care Model, participants discover, develop, and transmit ways to provide self-care (Comley, 1994).
8. According to Orem's Self-Care Model, participants structure relationships and tasks to provide self-care (Comley, 1994).

Summary

In order to improve glycemic control, patients with type 1 diabetes mellitus need to assume responsibility for managing the disease. For the empowerment model to be utilized in diabetes education, patients need to be acknowledged as an expert in their own lives. Glycemic control is an important, but complex aspect of diabetes management requiring elements such as social support and empowerment to help maintain control. Many studies focus on quality of life and adherence to treatment regimes and investigating both types of diabetes mellitus in one study. Few studies have explored the relationships between empowerment, social support, and glycemic control. This study identified whether a relationship exists among empowerment, social support, and glycemic control in adults with type 1 DM.

CHAPTER II

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Introduction

The purpose of this study was to identify whether a relationship exists among empowerment, social support, and glycemic control in adult patients with type 1 diabetes mellitus. In this chapter, the author presents the theoretical framework for the study and a review of literature involving diabetes, empowerment, and social support.

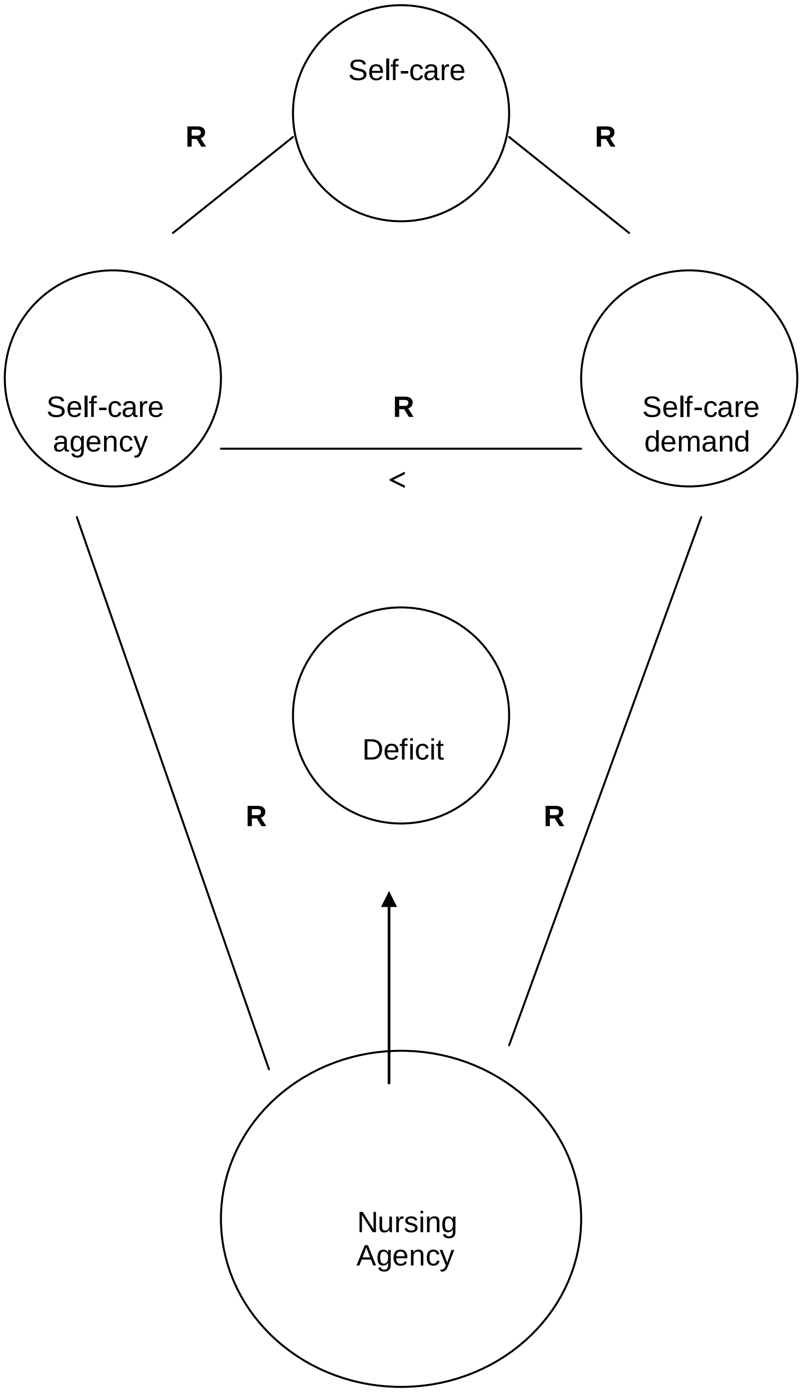
Theoretical Framework

Dorothea Orem's Self-Care Model (Orem, 2001) was used as the theoretical framework for the study. The model is based on the concept of self-care deficit. Termed a 'general theory of nursing,' this model is divided into three subtheories: (a) self-care deficit, (b) self-care, and (c) nursing systems. The self-care deficit subtheory identifies that patients may experience limitations to self-care related to their health state and may benefit from nursing intervention which may augment their own self-care efforts. Self-care is described as a learned behavior that regulates the patient's structural integrity, functioning, and development. The nursing system intervenes when necessary to prescribe, design, or provide care to meet a self-care deficit or regulate the patient's own self-care (Comley, 1994). The nursing system is the nursing care necessary to help the individual by guiding, supporting, teaching, or providing an environment which promotes personal development in relation to meet future demands.

In this model, Orem views humans as biopsychosocial beings, capable of and willing to provide care for themselves. Self-care is a continuous, deliberate, learned behavior of adult life necessary to maintain life, health, and well-being. Self-care is directed at meeting needs that are divided into three groups: (a) universal, (b) developmental, and (c) health-deviation (Comley, 1994). Universal self-care addresses physiological needs and functioning, protection, interaction, and a sense of normalcy. Universal self-care includes maintenance of air, water, food, elimination, activity, rest, solitude, social interaction, prevention of hazard and promotion of human functioning. Developmental self-care is associated with factors that affect life cycle development. This form of self-care promotes conditions that support growth and development and prevent or change conditions that adversely affect these processes. Health deviation self-care is associated with the increased demands experienced by a person during disease or illness (Comley, 1994; McEwen & Wills, 2007). Health deviation influences the ability of the person to provide self-care. During the time when the self-care needs of a person, known as self-care demand, are more than what the person can maintain alone, known as self-care agency, a deficit occurs and intervention is necessary. The nursing system provides direct or indirect care to compensate for the self-care the person cannot perform and to offer support for the person's own self-care efforts.

Three types of nursing systems are identified, depending on the need of the person: (a) wholly compensatory system, (b) partially compensatory system, and (c) supportive-educative system. The wholly compensatory system is utilized when the person is not capable of self-care. The partially compensatory system allows the nurse and person to work together. The supportive-educative system teaches the person to practice self-care measures and offers support throughout the process. The care provided throughout these three types of nursing systems may include doing or acting for another, guiding and directing, providing physical or psychological support, teaching, or fostering a supportive environment for development (Comley, 1994; Burns & Grove, 2003). A diagram of self-care deficit follows (Figure 1). Nursing care is only provided when a deficit develops (Burns & Grove, 2003).

For the current study, an adult patient with type 1 diabetes mellitus has a pathology requiring the need to acquire special skills to provide self-care known, according to Orem, as therapeutic self-care (Burns and Grove, 2003). Initially, a partially compensatory nursing system may be required due to the demands of the illness. As the patient becomes more knowledgeable and empowered to provide self-care, an educative and supportive nursing system can be utilized. Diabetes education is given to the patient and his or her support system to provide the tools for the patient to continue self-care. The nursing system is available for consultation, additional education, and support as needed throughout the illness in the supportive and educative role. Social support is available from family and friends for assistance, so that the patient may continue effective self-care. Once the self-care demand and self-care agency are again equalized, the patient can resume usual self-care behaviors with the added knowledge of the illness and management techniques. The process is continuous; another deficit can occur during future illness, stress, or life event.



R, relationship; <, deficit relationship, current or projected
Modified from Burns, N. and Grove, S. K. (2003). *Understanding nursing research (3rd ed.).*

Figure 1. Self-Care Deficit Model.

Literature Review

Empowerment

According to Barbara Levy Simon (1994), the history of empowerment starts as early as 1890 in the U.S. The term was coined in 1976 by Barbara Solomon in her book "Black Empowerment." Empowerment can point to regaining one's own power or to give power to someone else. Barbara Solomon (1976), while working with oppressed patients, identified empowerment as a process in which people increase skills at exercising interpersonal influence and performing valued social roles. Empowerment is identified as a process of increasing interpersonal, intrapersonal, and political power so individuals can take action to improve their own lives. According to Levy Simon (1994) the concept of empowerment developed out of a range of political approaches, such as the Social Reform movement; social reformers emphasized the value of clients and client self-determination.

Martha Funnell (2004), a member of a diabetes education team, first coined the term empowerment in diabetes education at the University of Michigan Diabetes Research and Training Center:

> Empowerment is the recognition that people with diabetes give 99 percent of their own care and that each is the most important person in determining their outcomes. Professionals used to try to get people to care for themselves in the way health professionals thought was best. We've come to realize that knowing what's best for diabetes is not the same as knowing what's best for someone with diabetes. Our work has been largely focused on helping health professionals let go of the old idea of 'getting people to change.' It isn't possible and it's not our job or responsibility. Instead, our job is to help people by creating a partnership --

> 'you tell me what you want, how hard you want to work, and I'll help you to reach those goals.' This is a huge paradigm shift! (University of Michigan Medical School, n.d.).

Anderson et al. (1995) identified patient empowerment as an effective approach to develop educational interventions for addressing psychosocial aspects of living with diabetes and believed empowerment to be conducive to improving glycemic control. Sixty-four self-selected participants, who had previously undergone diabetes education, were enrolled in a diabetes empowerment study. Of the 64, 46 were randomly assigned to either a 6-week intervention group or wait-listed control group. Eighteen were not willing or able to be assigned randomly. Twenty-two intervention patients attended a six-session empowerment program over a 6-week course. The wait control group attended the same empowerment program the following 6 weeks. Data was collected at baseline, 6, and 12 weeks. Compared to the control group, the intervention group improved in four of the eight self-efficacy scores and two of the four attitude scores. At the end of the 12 weeks, the intervention group had statistically significant decreases in HbA1c values ($p = 0.05$) compared to the control group, even though the control group had 6 weeks of intervention when the samples were drawn. A within group analysis indicated sustained improvements in all self-efficacy areas ($p = 0.001$), including; assessing satisfaction, setting goals, solving problems, emotional coping, managing stress, obtaining support, motivating oneself, and making decisions. Perceived self-efficacy is related to the willingness and ability of individuals to engage in various behavioral challenges, including preventative and disease management behaviors, resulting in empowerment. The study results cannot be generalized, since the participants were self-selected. The participants were highly educated, with 77% having attended college, and a majority

(54%) were on insulin. The authors also questioned whether participants had overestimated their level of empowerment in the pre-intervention evaluation.

Shiu et al. (2005) implemented a cross-sectional design to determine if empowerment predicted metabolic control. Researchers assessed 189 type 1 and type 2 diabetic participants, with a majority of type 2 diabetics, at a diabetes specialist outpatient clinic using the Chinese Diabetes Empowerment Scale (C-DES) and HbA1c levels. The C-DES had been shown in previous studies to have a reliability of 0.85, with statistically significant goodness of fit analyses (Shiu et al., 2006). Between-subjects t-tests, calculated on C-DES sub-scale scores, and HbA1c levels revealed no statistically significant differences as a function of diabetes mellitus type. The overall linear multiple regression model revealed the C-DES subscales explained no significant variation in HbA1c levels. Possible reasons for no relationship include that there may have been social and environmental factors influencing outcomes, intervening variables could enhance or deter patients' sense of control, or a relationship simply does not exist.

Schutt and Rogers (2009) used a qualitative approach to improve understanding of the processes by which self-help programs facilitate personal empowerment and decrease social isolation in a community-based, consumer-operated, drop-in mental health center named The Empowerment Center. Two methods were employed in this study (intensive interviews and focus groups) to improve understanding of the processes in which self-help programs facilitate patient empowerment and decrease social isolation. Eleven non-diabetic participants were selected for interviews after referral by the program director. Fifteen other participants were in one of two focus groups. One focus group included consumer staff members who meet regularly, developing a collective orientation best captured in a focus group. The other focus group included

Empowerment Center participants. Questions asked in the focus groups were similar to those asked in the interviews. The focus groups provided an opportunity for dialogue to enrich participants' comments and identify commonalities.

The interviewers asked 16 questions about motivations for joining the Empowerment Center, experiences at the Center, and use of other services. The participants' comments about their experiences with the Center focused on motives for joining, the process of developing social relations, managing mental illness, and helping others, "It changed my life, it changed me" (Schutt and Rogers, 2009, p. 702). The basis for retention of participants included social bonds and a supportive atmosphere. Participants found the Center a place of refuge from the stigma of mental illness, "I just thought it was a neat idea that they had a place for mentally ill people that was run by mentally ill people" (Schutt and Rogers, p. 704). The Center offered a way to learn how to help others, maintain social interaction with others, and was found to be a critical aspect of the empowerment process. Providing the sense of belonging, of being with others who care, seemed to be the Center's most valuable and distinctive achievement. Participants learned from each other how to meet the needs of people in similar situations and taught others to meet their own needs in the same ways (Schutt and Rogers).

McCarthy et al. (2002) used a quasi-experimental study design to compare the effects of empowering and traditional approaches to asthma education. Fifty-seven families participated. The first 29 families participated in an empowering approach to asthma education, while the remaining 28 families were assigned to the control group receiving a traditional information-giving approach to education. New instruments were developed in this study, since no appropriate tools were available. Content validity was established through expert review. A pilot test was performed with five families, and revisions were made based on feedback. Measured outcomes included knowledge, sense of control, ability to make decisions, and ability to provide care. The families were evaluated initially, immediately after the educational intervention, and 6 months after completion of educational sessions. Researchers found no significant difference in knowledge between the control and empowering groups. Total scores for sense of control increased in both groups over time, but the empowering group's scores increased at a greater rate, showing significant differences at the end of the study. The control group initially had higher scores in decision making ability and ability to provide care. The empowering group experienced gains showing significantly higher scores over the control group at the end of the educational sessions and at 6 months. The empowering approach to asthma education made a significant difference in sense of control, ability to make decisions, and ability to provide care for parents of children with asthma. Parents in the empowering group were more skilled in asserting control over their child's asthma care. Parents felt more capable of making day-to-day decisions about usual care and during worsening conditions. Parents were also more able to mobilize resources to assist with concerns.

Social Support

Social support for patients with chronic illnesses can influence treatment adherence and have a positive effect on health outcomes (Sayers et al., 2008). Researchers tested the relationship between social support and patient self-care on 74 patients with heart failure (HF) from Veterans Affairs Medical Center cardiology clinics. Previous studies suggested that positive social support is associated with fewer hospitalizations and decreased risk of mortality related to HF, and evidence from a broader range of chronically ill patients associates social support with better treatment adherence (Murberg, 2004; DiMatteo, 2004; Moser & Worster, 2000). Support from others potentially encourages better self-care activities such as diet and medication adherence. Self-care of HF involves regular maintenance tasks and management of symptoms. In addition to a patient's knowledge concerning when to obtain additional assistance from providers, a patient's confidence about self-care abilities may be a key determinant in the actual performance of behaviors. Social support may have an impact on self-care through practical assistance or direct attempts to influence health behaviors. Although availability is not sufficient to affect self-care, perceiving that others are emotionally and practically supportive may be an essential factor. "Patients with relatively high levels of social support from friends, a significant other, and other family members would report higher levels of self-care" (Sayers et al., p. 71).

Potential participants were identified through a screening process. All participants had structural heart disease with past or current symptoms of HD. Of the 214 patients who met criteria, only a total of 74 completed the relevant forms. The results confirmed that marriage increases the likelihood of the availability of support and the involvement of others in various medical care tasks. Medication adherence with reminding appears to be a function that is more typical of spouses and other intimate partners than other types of relationships. Living situation alone did not dictate whether HF patients were connected to or supported by others. Age was consistently associated with increased levels of perceived social support. Of particular interest, support from significant others was inversely related to self-care confidence. The study's findings added to the body of evidence indicating social support is associated with better self-care among HF patients (Sayers et al., 2008).

Warren-Findlow and Prohaska (2008) studied the specific type and extent of social support provided by family members of older African-American women managing heart disease. Data were collected on women's health beliefs about their heart disease and descriptions of how family members helped or inhibited their self-care practices. Twelve African-American women over 50 years of age were interviewed as part of a grounded theory study.

Family support was associated with better compliance to regimens and dietary changes, particularly with spousal support. Negative effects of family support in this study were identified as diet sabotage, or resistance to change from family members. Interestingly, reinforcement was also identified as a significant barrier to practicing chronic illness self-care. Self-care was predominantly influenced in the form of instrumental support, such as transportation or financial assistance. Some family members engaged in supporting dietary changes, while others used negative, restrictive methods. The familial interdependence demonstrates the significant influence family has on chronic illness self-care. Participants were not statistically representative of the larger population, since a small, purposeful study group was selected.

The development of a chronic illness, such as diabetes, requires significant life adjustments for both the patient and the spouse. The marital relationship can be a major support or a significant source of stress. "Although poor marriages may increase the likelihood of poor self-care, it is also likely that poor self-care will increase the likelihood of marital conflict" (Trief et al., 2004, p. 153).

A quantitative prospective study of 78 adults with insulin dependent DM was conducted to identify if a relationship exists between marital satisfaction and adherence to diabetes care regimen (Trief et al., 2004). Seventy-eight participants completed questionnaires with documented validity and reliability at the initiation of the study. Sixty individuals were able to be recontacted and were willing to complete the second assessment approximately 2 years later. HbA1c levels were also documented. Dietary self-care was related to marital quality, as was adherence to exercise and following healthcare providers' recommendations. The marital quality measures did not predict adherence to blood glucose monitoring or glycemic control.

Toljamo and Hentinen (2001) conducted a descriptive study in Finland, examining social support and adherence to self-care regimen among 213 adults with insulin dependent DM. An instrument measuring adherence to self-care was utilized and included areas, such as insulin treatment, diet, exercise, self-monitoring of blood glucose, activity, and responsibility related to managing diabetes. Two additional items measured negative support from family and friends; these items included support perceived as over-protectiveness or interference in one's life. The validity and reliability of the instruments used were evaluated as ranging from moderate to good. HbA1c was used as a measure of glycemic control. Perceived social support from family and friends in emotional, instrumental, and informational aspects were included, as well as informational support from professionals, peer support from others with diabetes, and financial support. Participants who lived alone rather than with family had higher HbA1c results; although if emotional and instrumental support was received, living status was no longer significant. Individuals 30 to 49 years of age, who lived alone, felt they received less support from family and friends compared to those who were under 30 years of age and lived with family or a partner. Older participants felt they received more informational support and peer support than younger participants. Those who reported negative support were more often men than women and were less educated. Individuals who adhered either strictly or flexibly to their self-management regimen received more social support from family and friends than those who neglected self-care. The results indicated that adherence to self-care was associated with social support from family and friends, specifically those with emotional and instrumental support from family and friends.

Summary

Empowerment has been shown to be an effective strategy in managing many chronic illnesses, including diabetes mellitus, mental illness, and asthma. Studies have also shown that empowerment alone does not effectively manage illness. A combination of strategies is necessary, such as social support and environmental change. Social support has been shown to influence disease management, both negatively and positively, in patients with diabetes, heart failure, and heart disease. In many studies, empowerment or self-efficacy and social support are researched together, since such a strong correlation exists between them. This study attempted to identify whether a relationship exists among empowerment, social support, and glycemic control in adult patients with type 1 diabetes mellitus.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to identify whether a relationship existed among empowerment, social support, and glycemic control in adult patients with type 1 diabetes mellitus. In this chapter, the author describes the study design, population, sample, sample setting, and data collection instruments. This chapter also includes data analysis procedures and limitations.

Study Design

The researcher used three survey tools and laboratory data to conduct a descriptive correlational study to identify if a relationship exists among empowerment, social support,and glycemic control in adult patients with type 1 diabetes mellitus.

Population, Sample and Setting

The target population in this study was outpatients with type 1 diabetes mellitus. The researcher obtained a convenience sample of 7 participants during a 2-month time frame of data collection. Participants included adult males and females, age 18 and older, of any race or ethnicity, who had been diagnosed with type 1 diabetes mellitus for 2 years or longer. The sample was obtained from a central Wisconsin family practice clinic where participants received outpatient health care. Exclusion criteria included: persons under age 18; persons who could not read, write, or speak English; diagnosis of type 1 diabetes mellitus less than 2 years; incompetent individuals; and individuals with guardians.

The researcher approached perspective participants during regularly scheduled office visits. The survey tools and chart review were obtained after participants signed informed consent following a verbal introduction of the study and its objectives. From chart review, the researcher documented the most recent HbA1c levels within 12 months of the study, length of diabetes diagnosis, and medication review.

Data Collection Instruments

The data collection instruments for the study Included: The Diabetes Empowerment Scale Short Form (DES-SF) (Appendix A), Norbeck's Social Support Questionnaire (NSSQ) (Appendix B), and the demographic questionnaire (Appendix C). Approval for the DES-SF scale was given by the Michigan Diabetes Research and Training Center (MDRTC), as long as MDRTC was the acknowledged source of the instrument. Approval for the NSSQ was granted provided that the 1995 scoring instructions were utilized.

The Diabetes Empowerment Scale Short Form (DES-SF) is an 8-item, 5-point Likert-type scale. Anderson, Funnell, Fitzgerald, and Marrero (2000) tested the original long form DES using a convenience sample of 375 participants in the Michigan Diabetes Research and Training Center outreach programs. Reliability was tested using a test-retest method that measures the instrument's stability. A control group completed the DES at baseline and 6 weeks later. The reliability coefficient was 0.79. Validity was measured using content, criterion-related and construct validity methods. Content validity was supported, since the DES was derived from previous theoretical-based work in patient empowerment. The concurrent validity method was used to test criterion-related validity. The three subscales of the DES were validated with two previously validated subscales on the Diabetes Care Profile. Moderate correlations of 0.32 to 0.59 were demonstrated. Factor analysis was used to test construct validity with identification of a 3-factor solution for subscales. The DES yielded an alpha coefficient of 0.96. The three subscales had alpha coefficients of 0.93 (Managing the Psychosocial Aspects of Diabetes), 0.81 (Assessing Dissatisfaction and Readiness to Change), and 0.81 (Setting and Achieving Diabetes Goals).

The DES-SF was created by choosing the items with the highest item to subscale correlation from each of the original eight conceptual domains of the DES. The reliability of the DES-SF was 0.85 and 0.84, respectively. Content validity was supported because both DES-SF and HbA1c levels changed in a positive direction; the changes were not correlated, suggesting that these two measures vary independently (Anderson, Fitzgerald, Gruppen, Funnell, & Oh, 2003).

Norbeck's Social Support Questionnaire is a 9-item, 5-point, Likert-like scale following the listing of significant people in the respondent's life. The instrument measures multiple components of social support, including emotional and tangible support (known as functional properties of social support), stability of relationships, frequency of contacts (known as network properties of social support), and descriptive data about recent losses of supportive relationships. Amount of support from specific sources can also be calculated. Two questions were developed to measure each of the functional properties of social support -- *Affect, Affirmation*, and *Aid.* Three network properties reflect the size, stability, and availability of how social support is provided. Question 7 identifies the number listed in the network and the relationship, and Question

8 identifies contact frequency. Question 9 identifies recent losses of important relationships.

Norbeck, Lindsey, and Carrieri (1981) initially tested the NSSQ with 75 master's nursing students and 60 senior nursing students. Students were administered various questionnaires, including the NSSQ, the Marlowe-Crowne Social Desirability Scale, the Social Support Questionnaire developed by Cohen and Lazarus, the Profile of Mood States by McNair, Lorr, and Dropplemann, and the Life Experiences Survey by Sarason.

The author initiated a second phase of testing, further testing the validity and reliability of the tool (Norbeck et al., 1981). Since the NSSQ is not a summative-type instrument, testing internal consistency with coefficient alpha is not appropriate. Pearson correlations among the items and subscales were instead calculated. Internal consistency reliability indicated each of the two items for each subscale were highly correlated: *Affect*, 0.97; *Affirmation*, 0.96; and *Aid* 0.89. Correlations between the *Aid* items and *Affect* and *Affirmation* items ranged from 0.72 to 0.78. The three network properties (*Number in Network, Duration of Relationships,* and *Frequency of Contact*) correlations ranged from 0.88 to 0.96. The network properties correlated highly with *Affect* and *Affirmation* (0.88 and 0.97) and moderately with *Aid* (0.69 to 0.80). Test-retest reliability identified a coefficient of 0.89 for *Affect*, 0.88 for *Affirmation*, and 0.86 for *Aid.* The three network properties also identified high correlations with 0.92. Lack of bias toward socially desirable responses was suggested related to low correlations with items from the NSSQ and the social desirability scale ranging from 0.01 to 0.17. Concurrent validity was demonstrated with some of the correlations between constructs in the NSSQ and the exploratory social support measure by Cohen and Lazarus. *Affect, Affirmation,* and *Aid* correlated with the emotional support component at 0.51, 0.56, and 0.44.

Affirmation correlated with the informational support at 0.33. Initially, testing of construct validity did not produce findings which were significant due to a small sample size of 33 senior nursing students. Previous studies have not utilized the NSSQ while examining the effect of social support on the diabetic population.

Data Collection Procedures

The researcher requested access to clients from one central Wisconsin clinic. The researcher obtained Institutional Review Board (IRB) approval from the University of Wisconsin Oshkosh and from the clinic for entry into the facility. The researcher approached patients attending regularly scheduled clinic appointments, explained the study, and asked for informed consent to participate in the study. The three questionnaires, including the demographic questionnaire, DES-SF, and NSSQ were explained to the participants, and participants completed these prior to exiting the facility. The questionnaires took approximately 20 to 30 minutes to complete. The researcher documented the most recent HbA1c level, length of diabetes diagnosis and medications on the demographic questionnaire following informed consent and chart review.

Protection of Human Participants

Participant identity and all information from the study remained confidential. All data were given a code number for confidentiality. Information was not released in a way that could identify the participants. All information will be destroyed by shredding paper documents and deleting electronic files 3 years after the study is completed. All information collected will be stored in a locked file drawer or a password-protected computer. Only the researcher and nursing department clinical paper chairperson have access to this information.

Anticipated risk of harm in the research appeared no greater than that encountered in daily life or routine clinic visit. Participants were allowed to withdraw from the study at any point, with data collected up to that point destroyed upon participant request. No participants withdrew from the study. Participants were fully informed of the study purpose, risks, benefits, and confidentiality of information and told that refusal to participate would not compromise care provided. This was explained in the informed consent (Appendix D).

Data Analysis Procedures

The University of Wisconsin Oshkosh Research Center staff input the data into the SPSS software and ran the analysis program. Data were analyzed using descriptive and correlational statistics, including frequencies, means, and Pearson r correlations. Pearson r correlations were conducted on variables, including the DES-SF, the NSSQ, and HbA1c levels. Evaluation of these variables with demographic data helps identify additional characteristics affecting empowerment, social support, and glycemic control.

Anticipated Limitations

Anticipated limitations of this study include:

1. This study had a small sample size which affects generalization of the results and power.
2. Sampling bias may have been present, since only participants seen in the central Wisconsin clinic for office visits during the data collection period had the opportunity to participate in the study and only those who wished to enter.

3. Sampling bias might have been present, since only certain participants completed the questionnaires; those with higher HbA1c levels (poor glycemic control) may have declined.
4. Selection bias was present, since participants were self-selected, having had time to participate, transportation available, and the ability to read and write in the English language.
5. Response set bias was possible due to psychometric scales being utilized.
6. Participants may have underestimated or overestimated their level of empowerment or social support.

Summary

The researcher used a descriptive, correlational design to measure the relationship among empowerment, social support, and glycemic control in adult patients with type 1 diabetes mellitus. A convenience sample of 7 outpatients was obtained from a central Wisconsin clinic. Participants signed informed consent and responded to three questionnaires during scheduled office visits. All information was kept confidential. The researcher analyzed data utilizing descriptive and Pearson r correlational statistics.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

The purpose of this study was to identify whether a relationship exists among empowerment, social support, and glycemic control in adult patients with type 1 diabetes mellitus. Demographic information and results are presented in this chapter, along with a discussion of the results.

Sample Description

A convenience sample of 7 volunteer participants attending regularly scheduled office visits was obtained. All participants had type 1 diabetes mellitus, were age 18 and older, were diagnosed with type 1 diabetes mellitus for 2 years or longer, and were able to read and write English.

Analysis of Data Quality

The researcher and a research assistant entered data from seven questionnaires into the SPSS program. Data were analyzed for data entry errors and then for completeness. Three (42.8%) questionnaires were missing information because participants failed to complete one page of the survey tool or certain questions. Two (28.6%) of the three participants missed four questions on the DES-SF. The scales were scored by obtaining the mean of the completed items. One of the three participants missed two questions on the NSSQ. Results were adjusted to take into account the deleted information: According to the NSSQ scoring guidelines, if an entire question is omitted, the subscale or variable calculated for that question is not valid but the entire questionnaire does not need to be discarded: the remaining subscale and variable can still be calculated (Norbeck, 2001).

Demographic Data

The sample included five (71.4%) males and two (28.6%) females, ranging in age from 19 to 74 years, with a mean age of 51 years. All participants were White. Five (71.4%) participants were married; two (28.6%) were never married. The highest level of education was distributed as follows: One (14.3%) participant was a high school graduate or completed a general education degree (GED), four (57.1%) participants completed some college or technical school, and two (28.6%) completed graduate degrees. Participants were diagnosed with diabetes ranging from 2.5 years to 50 years, with a mean of 31 years. One (14.3 %) participant utilized injections and six (85.7%) utilized a pump to administer insulin. In comparison nationally, approximately 9% of type 1 diabetics utilize an insulin pump (Diabetes Monitor, n.d.).

All seven participants self-reported HbA1c levels. Chart review was completed to verify date of last HbA1c. HbA1c levels ranged from 6.3 to 9.7, with a mean of 7.6. HbA1c levels, demographic data, and survey scores are presented in Table 1.

Table 1

HbA1c Levels, Demographic Data, and Survey Scores

Participant	1	2	3	4	5	6	7
HbA1c	6.7	6.6	8.5	6.3	8.3	9.7	7.3
Gender	female	male	female	male	male	male	Male
Age	52	57	52	39	74	19	66
Years with Diabetes	42	50	41	2.5	30	15	38
Marital Status	Married	Never Married	Married	Married	Married	Never Married	Married
Insulin Administration	Injection	Pump	Pump	Pump	Pump	Pump	Pump
Education	Some college	Graduate degree	Some college	Some college	High school graduate	Some college	Graduate degree
Mean Empowerment Score	4.500	4.375	4.750	2.250	5.000	2.250	4.125
Total Functional Support Score	3.625	3.520	3.212		3.795	2.195	3.600

Diabetes Empowerment Scale – Short Form Scores

Participants in the study sample responded to Diabetes Empowerment Scale – Short Form (DES-SF) questions using a 1 to 5 Likert scale. A score of 1 corresponded to “strongly disagree” and 5 corresponded to “strongly agree.” A higher score reflected a higher level of diabetes related psychosocial self-efficacy (empowerment). Five (71.4%) participants completed all questions, and two participants completed only four questions. The scale was scored by obtaining the mean of all completed items. On average, participants “somewhat” to “strongly agreed” (4.54), with the overall assessment of diabetes related psychosocial self-efficacy each possessed. Female participants identified a higher level of diabetes related psychosocial self-efficacy compared to male participants. The two youngest participants identified a lower level of diabetes related psychosocial self-efficacy compared to the rest of the sample.

Norbeck’s Social Support Questionnaire (NSSQ) scores

Participants responded to Norbeck’s Social Support Questionnaire, a 9-item, 5-point Likert-like scale following the listing of significant people in the respondent’s life. For Questions 1 through 6, a score of 0 corresponded to “not at all,” a score of 1 corresponded to “a little,” a score of 2 corresponded to “moderately,” a score of 3 corresponded to “quite a bit,” and score of 4 corresponded to “a great deal.” A higher score reflected higher perceived social support. Questions 1 through 4 related to perceived emotional support and Questions 5 and 6 related to perceived tangible support. Question 7 related to duration of relationship. A score of 1 corresponded to “less than 6 months,” a score of 2 corresponded to “6 to 12 months,” a score of 3 corresponded to “1 to 2 years,” a score of 4 corresponded to “2 to 5 years,” and a score of 5 corresponded to “more than 5 years.” A higher score reflected a longer duration of a relationship. Question 8 related to frequency of contacts, with a score of 1 corresponding to “once a year or less,” a score of 2 corresponding to “a few times a year,” a score of 3 corresponding to “monthly,” a score of 4 corresponding to “weekly,” and a score of 5 corresponding to “daily.” A higher score reflected more frequent contact with the support person or system. Six (85.7%) participants completed all questions; one (14.3%) male participant completed seven of the nine questions. Since information was missing for this participant, the emotional support subscale was incomplete, and the total functional support variable could not be calculated. The other subscale, tangible support, and variable, total network properties, can still be used for this participant. NSSQ score results are summarized in Table 2.

Table 2

Noreck's Social Support Questionnaire (NSSQ)

Participant	1	2	3	4	5	6	7	Mean
Number in Network	6	10	3	4	3	7	10	6
Emotional Support Subscale	3.670	3.690	3.590		3.920	2.820	3.450	3.523
Aid (Tangible Support) Subscale	3.580	3.350	2.835	3.500	3.670	1.570	3.750	3.179
Total Functional Support Variable	3.625	3.520	3.212		3.795	2.195	3.600	3.324
Duration of Relationship	5.000	4.800	4.670	4.500	4.330	4.710	5.000	4.716
Frequency of Contacts	4.500	4.000	3.670	4.250	3.000	3.430	4.100	3.850

The source of support categories reported by the greatest number of subjects included spouse and partner, family or relatives, and healthcare providers (71.4%), followed by friends (57.1%), work or school associates (28.6%), and minister, priest or rabbi (14.3%). Sources of support categories are summarized in Table 3. Of all the support categories listed, family or relatives had the highest number of persons listed in the network. With a total of 43 persons listed in sources of support in all surveys, 17 (39.5%) were family or relatives, followed by 10 (23.3%) were healthcare providers, 7 (16.3%) were friends, 5 (11.6%) were spouse or partner, 3 (6.9%) were work or school associates, and 1 (2.3%) was a minister, priest or rabbi. The high influence of family and relatives, as well as healthcare providers, is an important finding of the study.

Table 3

Sources of Support Categories

Source of support	Number and percentage of participants listing source in network		Number and percentage of times participants listed source in network (n = 43)	
	Number	Percent	Number	Percent
Spouse or partner	5	71.4	5	11.6
Family or relatives	5	71.4	17	39.5
Friends	4	57.1	7	16.3
Work or school associates	2	28.6	3	6.9
Health care providers	5	71.4	10	23.3
Minister, priest or rabbi	1	14.3	1	2.3

Relationship Between Empowerment, Social Support, and HbA1c

Data were analyzed to determine if significant relationships existed between empowerment as measured by the DES-SF, social support as measured by NSSQ, and glycemic control as measured by HbA1c levels. Using a Pearson r, no significant correlation existed between empowerment and HbA1c (r = 0.390, p = 0.388) or total functional support and HbA1c (r = -0.677, p = 0.140). There was an inverse relationship between empowerment and total functional support (r = -0.868, p = 0.025), meaning that the more empowered a participant is, the less functional support was necessary and vice versa. This relationship could be explained in relation to autonomy; if a participant is autonomous with a high level of diabetes-related empowerment, the participant may not need or want as much emotional and/or tangible support to function. Inversely, if a participant has a high level of functional support, he or she may not need or feel high levels of empowerment due to dependence on other people for diabetes management including diet modification and glucose monitoring. Table 4 represents the correlation between empowerment, social support, and HbA1c. A positive relationship was identified between emotional support and tangible aid ($r = 0.953$, $p = 0.003$). This relationship indicates if a high level of emotional support is present, the participant will also have high levels of tangible support, such as transportation assistance or monetary support.

Table 4

Correlation Between Empowerment, Social Support, and HbA1c

		HbA1c	Functional Support	Empowerment
HbA1c	Pearson r	1.000	-0.677	0.390
	Sig (2-tailed)		0.140	0.388
	N	7	6	7
Functional Support	Pearson r	-0.677	1.000	-0.868
	Sig (2-tailed)	0.140		0.025*
	N	6	6	6
Empowerment	Pearson r	0.390	-0.868	1.000
	Sig (2-tailed)	0.388	0.025*	
	N	7	6	7

*correlation is significant at the 0.05 level (2-tailed)

Discussion

No significant correlation existed between empowerment and HbA1c or total functional support and HbA1c. There was an inverse relationship between empowerment and total functional support. Compared to the studies by Sayers et al. (2008), Warren-Findlow and Prohaska (2008), and Toljamo and Hentinen (2001), increased social support resulted in improved self-care, the opposite result found in the present study. No significant correlation was found between empowerment and HbA1c similar to findings from Shiu et al. (2005). A participant who is empowered may have an increased sense of control, ability to make decisions, and ability to provide self-care, but these attributes alone may not influence the HbA1c level, identifying the complexity involved in maintaining good glycemic control.

Female participants reported higher levels of empowerment than male participants. The two youngest participants reported lower levels of empowerment than the rest of the sample.

Family and relatives, as well as healthcare providers, were the most widely recognized individuals providing social support for participants. Six participants were utilizing insulin pumps to administer insulin, and three participants, two utilizing insulin pumps and one utilizing injections, had HbA1c levels within control (less than 7%),

The previously identified hypotheses are rejected due to the results of the study; however, the sample size was very small.

1. Participants with higher levels of diabetes empowerment do not necessarily experience better glycemic control than those with lower levels of diabetes empowerment.
2. Participants with higher levels of social support do not necessarily experience better glycemic control than those with lower levels of social support.
3. Participants with higher levels of both diabetes empowerment and social support will not necessarily experience better glycemic control than those with lower levels of both diabetes empowerment and social support.

Integrating Results Into Orem's Self-Care Model

For the current study, during the time when the self-care needs of a participant (self-care demand) are more than what the participant can maintain alone (self-care agency) a deficit occurs and intervention is necessary. The results of the study indicate a decrease in levels of empowerment result in an increase of social support. According to Orem, the nursing system can compensate for the lack of self-care by the participant to offer support to assist in care efforts for the participant. In the current study, nursing support would be necessary to compensate for lack of diabetes related empowerment.

Limitations

The researcher identified several limitations. The sample size was too small for a meaningful statistical analysis. A power analysis indicated 50 participants were needed to achieve an alpha of 0.5, a desired power of 0.8. Seven participant surveys were included in the final data analysis. Additional participants possibly could have been obtained if the study was advertised in local newspapers or throughout the clinic and hospital. With most regularly attended office visits being scheduled every 3 to 6 months, some participants may have been missed due to previous appointments prior to IRB approval to begin the study.

The sample was homogenous in race, age, and duration of diabetes. Sampling bias was present, since only participants seen in the central Wisconsin clinic for office visits during the data collection period had the opportunity to participate in the study. Selection bias was also present since participants were self-selected, had time to participate, transportation available, and the ability to read and write in the English language.

The location and timing of completion of the surveys may have negatively affected the results. The surveys were distributed following a 45-minute clinic appointment, which was often delayed, so participants were in the clinic for, at times, one to two hours prior to the completion of the survey. Due to space constraints, participants could not complete surveys prior to appointment times. The participants may have been rushed to complete the surveys, which may have resulted in skewed data.

Another limitation involved the survey instruments. Participants may have underestimated or overestimated their level of empowerment or social support. Additionally, the NSSQ was lengthy. Many participants required additional education to complete the survey. Specific examples were given to explain the questions more clearly. The participants identified that the amount of questions asked on the survey was time consuming; one participant did not complete the survey. A shorter, more clear-cut survey may have produced more accurate responses. The researcher being present during the completion of the surveys would also be beneficial to check for completeness prior to the participants leaving. Lastly, the DES-SF questions seemed ambiguous to some. For example, some participants did not feel negatively about having diabetes, but needed to identify if they could find ways to feel better about having diabetes.

Summary

Information about sample demographics, study results, and limitations were presented in this chapter. No significant correlation was found between empowerment and HbA1c or between total functional support and HbA1c. An inverse relationship was found between total functional support and empowerment. Female participants reported higher levels of empowerment than male participants. The two youngest participants identified a lower level of empowerment compared to the rest of the sample. Family and relatives, as well as healthcare providers, were the most widely recognized individuals providing social support for participants. Six participants were utilizing insulin pumps to administer insulin and three participants, two utilizing insulin pumps and one utilizing injections, had HbA1c levels within control (less than 7%).

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine if a relationship exists among empowerment, social support, and glycemic control in adults with type 1 diabetes mellitus.

The study sample consisted of a convenience sample of seven volunteer participants attending regularly scheduled office visits. All participants had type 1 diabetes mellitus, were age 18 and older, diagnosed with type 1 diabetes mellitus for 2 years or longer, and were able to read and write English. The three surveys participants completed included:

1. Demographic
2. DES-SF, and eight item survey measuring psychological skills associated with diabetes empowerment
3. NSSQ, a nine item survey measuring interpersonal transactions

HbA1c levels were self–reported by all participants. Six (85.7%) of the participants utilized a pump to administer insulin, as compared nationally to approximately 9% (Diabetes Monitor, n.d.). The disparity may be due to the current research sample seeking care with a healthcare provider that recommends insulin pump therapy for all patients with type 1 DM. An analysis was completed using descriptive and correlational statistics. Based on the findings of the study, the following was identified:

1. No relationship was found between empowerment and glycemic control.
2. No relationship was found between social support and glycemic control.
3. An invasive relationship was found between empowerment and social support; an increase in one variable was reflected in a decrease in the second variable. A diabetic with a high level of diabetes-related empowerment may not need or want much emotional and/or tangible support to function. Inversely, if a participant had a high level of functional support, he or she had lower levels of empowerment, possibly due to dependence on other people for functioning.
4. Family and relatives, as well has healthcare providers, were the most widely recognized individuals providing social support for participants.

Recommendations

1. Replication using larger sample size to increase validity and generalizability of findings.
2. Utilize publicity to promote study in order to achieve higher participation.
3. Study the pediatric population since there was much interest from this population.
4. Utilize more than one clinical site, in a variety of rural and metropolitan locations to obtain a more variable population.
5. Utilize more simplistic, yet valid and reliable survey tools for social support and diabetes-related empowerment since the NSSQ seemed difficult and lengthy and the DES-SF was ambiguous.

6. Have the researcher available during the completion of the surveys to answer questions and assure completion as needed.
7. Utilize a qualitative research study, to document how patients with type 1 diabetes maintain glycemic control.
8. Identify other components of lifestyle that could impact glycemic control such as income, socioeconomic status, location of residency, dietary factors, and activity.
9. Compare results of pediatric population with adult population related to empowerment, social support and glycemic control.
10. Locate specific social support tools for future research projects that examine social support in conjunction with diabetes management.
11. Identify the role that healthcare providers play in the support of patients by asking specific questions about the ways providers help and/or hinder in the diabetes management.

Conclusions

Glycemic control is a complex component of diabetes management. From past research, healthcare providers understand the importance of maintaining tight control of glucose levels to prevent or lessen complications. Since the management of type 1 DM is based on the person’s own goals, priorities, health issues, family demands, and other personal issues, it is important for the healthcare provider to personalize care to facilitate the highest level of functioning, glycemic control, and quality of life for the patient with type 1 DM. The present study results add to previous research related to diabetes care, but also recommends the continued need to discover how healthcare providers can better assist patients with diabetes management. Further research needs to be done with a larger sample size to ascertain whether there is a true relationship between empowerment, social support, and glycemic control.

APPENDIX A

Diabetes Empowerment Scale – Short Form

University of Michigan Diabetes Research and Training Center
Diabetes Empowerment Scale-Short Form (DES-SF)

The 8 items below constitute the DES-SF. The scale is scored by averaging the scores of all completed items (Strongly Disagree =1, Strongly Agree = 5) des

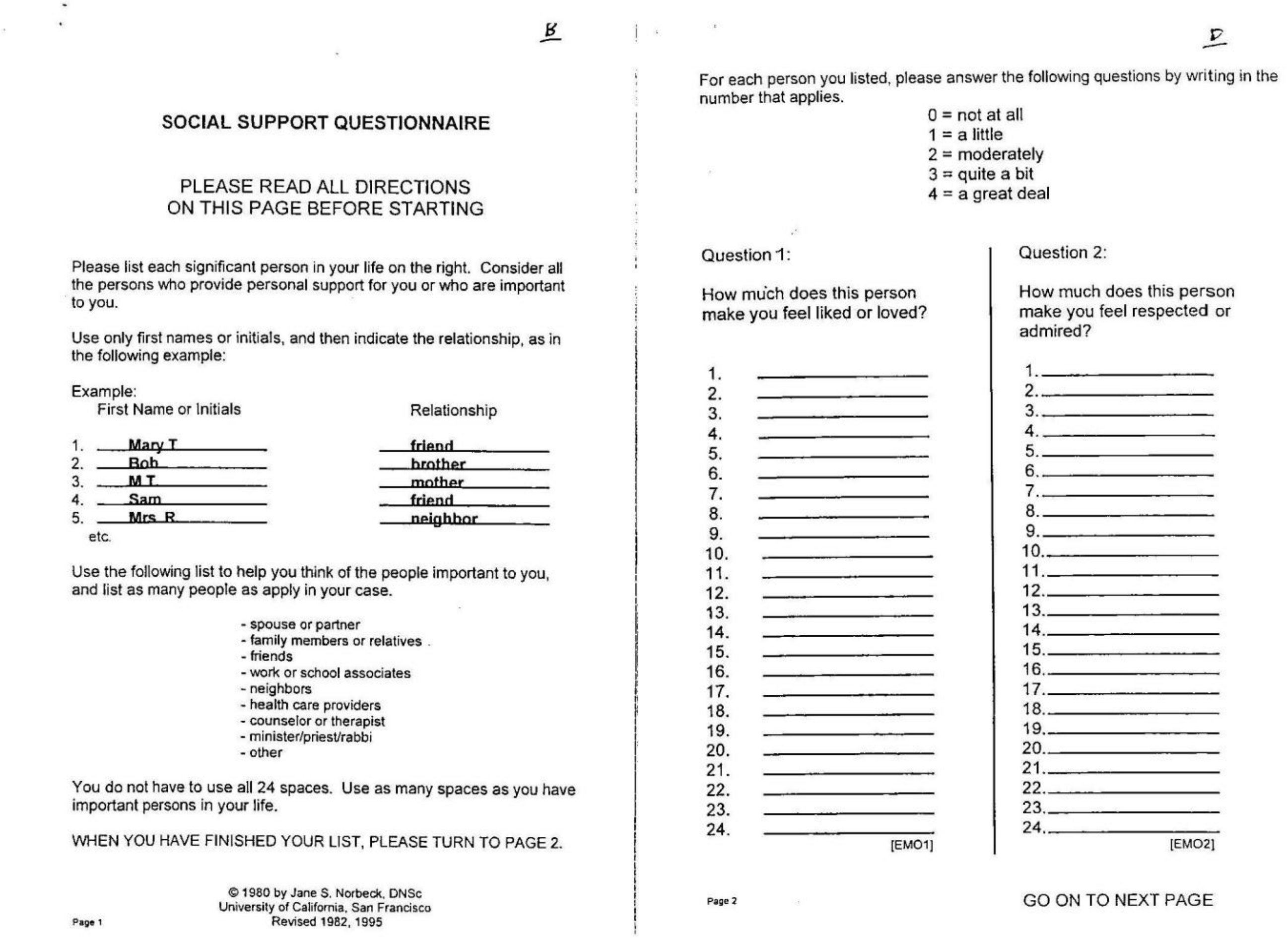
Check the box that gives the best answer for you.

In general, I believe that I:

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

APPENDIX B

Norbeck’s Social Support Questionnaire



B

SOCIAL SUPPORT QUESTIONNAIRE

PLEASE READ ALL DIRECTIONS
ON THIS PAGE BEFORE STARTING

Please list each significant person in your life on the right. Consider all the persons who provide personal support for you or who are important to you.

Use only first names or initials, and then indicate the relationship, as in the following example:

Example:

	First Name or Initials	Relationship
1.	Mary T	friend
2.	Bob	brother
3.	M T	mother
4.	Sam	friend
5.	Mrs R	neighbor

etc.

Use the following list to help you think of the people important to you, and list as many people as apply in your case.

- spouse or partner
- family members or relatives
- friends
- work or school associates
- neighbors
- health care providers
- counselor or therapist
- minister/priest/rabbi
- other

You do not have to use all 24 spaces. Use as many spaces as you have important persons in your life.

WHEN YOU HAVE FINISHED YOUR LIST, PLEASE TURN TO PAGE 2.

D

For each person you listed, please answer the following questions by writing in the number that applies.

0 = not at all
1 = a little
2 = moderately
3 = quite a bit
4 = a great deal

Question 1: How much does this person make you feel liked or loved?	Question 2: How much does this person make you feel respected or admired?
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.
11.	11.
12.	12.
13.	13.
14.	14.
15.	15.
16.	16.
17.	17.
18.	18.
19.	19.
20.	20.
21.	21.
22.	22.
23.	23.
24.	24.
[EMO1]	[EMO2]

GO ON TO NEXT PAGE

0 = not at all
1 = a little
2 = moderately
3 = quite a bit
4 = a great deal

Question 3:

How much can you confide in this person?

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____
11. ____
12. ____
13. ____
14. ____
15. ____
16. ____
17. ____
18. ____
19. ____
20. ____
21. ____
22. ____
23. ____
24. ____

[EMO3]

Question 4:

How much does this person agree with or support your actions or thoughts?

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____
11. ____
12. ____
13. ____
14. ____
15. ____
16. ____
17. ____
18. ____
19. ____
20. ____
21. ____
22. ____
23. ____
24. ____

[EMO4]

0 = not at all
1 = a little
2 = moderately
3 = quite a bit
4 = a great deal

Question 5:

If you needed to borrow $10, a ride to the doctor, or some other immediate help, how much could this person usually help?

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____
11. ____
12. ____
13. ____
14. ____
15. ____
16. ____
17. ____
18. ____
19. ____
20. ____
21. ____
22. ____
23. ____
24. ____

[AID5]

Question 6:

If you were confined to bed for several weeks, how much could this person help you?

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____
11. ____
12. ____
13. ____
14. ____
15. ____
16. ____
17. ____
18. ____
19. ____
20. ____
21. ____
22. ____
23. ____
24. ____

[AID6]

GO ON TO NEXT PAGE

Question 7:

How long have you known this person?

1 = less than 6 months
2 = 6 to 12 months
3 = 1 to 2 years
4 = 2 to 5 years
5 = more than 5 years

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______
7. ______
8. ______
9. ______
10. ______
11. ______
12. ______
13. ______
14. ______
15. ______
16. ______
17. ______
18. ______
19. ______
20. ______
21. ______
22. ______
23. ______
24. ______

[DURATION]

Question 8:

How frequently do you usually have contact with this person? (Phone calls, visits, or letters)

5 = daily
4 = weekly
3 = monthly
2 = a few times a year
1 = once a year or less

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______
7. ______
8. ______
9. ______
10. ______
11. ______
12. ______
13. ______
14. ______
15. ______
16. ______
17. ______
18. ______
19. ______
20. ______
21. ______
22. ______
23. ______
24. ______

[FREQCON]

PLEASE BE SURE YOU HAVE RATED EACH PERSON ON EVERY QUESTION. GO ON TO THE LAST PAGE.

Number ______ [IDNO]

Date ______

PERSONAL NETWORK

	First Name or Initials	Relationship	
1.	______	______	[SOU1]
2.	______	______	[SOU2]
3.	______	______	[SOU3]
4.	______	______	[SOU4]
5.	______	______	[SOU5]
6.	______	______	[SOU6]
7.	______	______	[SOU7]
8.	______	______	[SOU8]
9.	______	______	[SOU9]
10.	______	______	[SOU10]
11.	______	______	[SOU11]
12.	______	______	[SOU12]
13.	______	______	[SOU13]
14.	______	______	[SOU14]
15.	______	______	[SOU15]
16.	______	______	[SOU16]
17.	______	______	[SOU17]
18.	______	______	[SOU18]
19.	______	______	[SOU19]
20.	______	______	[SOU20]
21.	______	______	[SOU21]
22.	______	______	[SOU22]
23.	______	______	[SOU23]
24.	______	______	[SOU24]

9. During the past year, have you lost any important relationships due to moving, a job change, divorce or separation, death, or some other reason?

_______ 0. No
_______ 1. Yes
[LOSS]

IF YOU LOST IMPORTANT RELATIONSHIPS DURING THIS PAST YEAR:

9a. Please indicate the number of persons from each category who are *no longer available* to you.

________spouse or partner
________family members or relatives [LOSS1]
________friends [LOSS2]
________work or school associates [LOSS3]
________neighbors [LOSS4]
________health care providers [LOSS5]
________counselor or therapist [LOSS6]
________minister/priest/rabbi [LOSS7]
________other (specify) ____________________ [LOSS8]
[LOSS9]

[LOSSNO]

9b. Overall, how much of your support was provided by these people who are no longer available to you? [LOSSAMT]

________ 0. none at all
________ 1. a little
________ 2. a moderate amount
________ 3. quite a bit
________ 4. a great deal

APPENDIX C

Demographic Questionnaire

Please fill in the appropriate circle(s) or fill in the blank:

1) Gender

- ○ Male
- ○ Female

2) Age ___________

3) What is your marital status? Please indicate one.

- ○ Never married
- ○ Married
- ○ Separated
- ○ Divorced
- ○ Widowed
- ○ Live with partner
- ○ Other: ________________

4) What is your ethnic origin/race? Please indicate all that apply.

- ○ White
- ○ African-American
- ○ Hispanic
- ○ Native American
- ○ Asian or Pacific Islander
- ○ Other: ______________________

5) How much schooling have you completed? Please indicate one.

- ○ 8th grade or less
- ○ Some high school
- ○ High school graduate or GED
- ○ Some college or technical school
- ○ College graduate (bachelor or associate degree) Please circle.
- ○ Some graduate school
- ○ Graduate degree. Please indicate degree__________________

6) How do you administer your insulin?

- ○ Insulin injection
- ○ Insulin pump

7) How many years have you had diabetes? ______________

8) Last Hemoglobin A1c? __________

Date?______________

APPENDIX D

University of Wisconsin-Oshkosh
Documented Informed Consent

UNIVERSITY OF WISCONSIN OSHKOSH
DOCUMENTED INFORMED CONSENT

Lynne Derezinski, Family Nurse Practitioner student at the University of Wisconsin Oshkosh, under the supervision of Roxana Huebscher, PhD, FNPC, is conducting a study to identify if a relationship exists among empowerment, social support and glycemic control in adult patients with type 1 diabetes mellitus.

You will complete a brief information form and two questionnaires about your life with diabetes. These questions will take about 20-30 minutes to answer. I appreciate your honesty and completeness when completing these surveys. In addition, I would like to access your medical record to obtain your most recent HbA1c result, length of time diagnosed with diabetes, and a current list of your medications.

Participation in this project is voluntary. Your care will not be affected if you do not participate. I do not anticipate that the study will present any medical or social risk to you, other than the inconvenience of extra time required for you to answer the questionnaires. The information obtained may be helpful to others in the future.

Information you provide will be kept confidential. All data will be given a code number instead of your name so your identity is kept confidential. Your information will not be released to your health care provider or anyone else in a way that could identify you. All information will be destroyed by shredding paper documents and deleting electronic files 3 years after the study is completed. All information collected will be stored in a locked file drawer or a password-protected computer. Only Ms. Derezinski and Dr. Huebscher will have access to this information.

You may withdraw from the study at any time without penalty. Information collected from you up to that point would be destroyed if you so desire.

If you have any complaints about your treatment as a participant in this study, please call or write:

Chair, Institutional Review Board
For Protection of Human Participants
c/o Grants Office
University of Wisconsin – Oshkosh
Oshkosh, WI 54901
(920) 424-1415

I have received an explanation of the study and agree to participate. I give my permission to a chart review of my medical records to obtain the most recent Hemoglobin A1c (HbA1c) level, medication review and date of diabetes diagnosis.

Signature: ____ Date: _____________

APPENDIX E

ThedaCare Institutional Review Board Letter

THEDACARE

Institutional Review Board

2009

Date: September 24, 2009

The document referenced below was presented for **IRB review.**

Study Name: **Does a relationship exist among empowerment, social support and glycemic control adult patients with type 1 diabetes mellitus? By Lynne Derezinski**

Date of Document Presented: September 21, 2009

Document for Review: Submission Form, Informed Consent

After review of your research protocol, it is determined that your study is **Exempt** under 45 CFR 46.101(b).

You will need to inform the ThedaCare Institutional Review Board in a timely fashion of serious adverse events that occur, or if there are protocol changes, updates, amendments or violations. Failure to provide any of the above may result in the suspension or termination of support from the ThedaCare Institutional Review Board.

I have reviewed the above document and approve it as **Exempt** on behalf of the ThedaCare Institutional Review Board.

Sincerely,

J Swanson

John Swanson, Jr., M.D., Chairman
ThedaCare Institutional Review Board

APPENDIX F

University of Wisconsin Oshkosh IRB

THE UNIVERSITY OF WISCONSIN
OSHKOSH

October 27, 2009

Ms. Lynne Derezinski
353 Clinton Ct.
Amherst, WI 54406

Dear Ms. Derezinski:

On behalf of the UW Oshkosh Institutional Review Board for Protection of Human Participants (IRB), I am pleased to inform you that your application has been approved for the following research: Relationship Between Empowerment and Glycemic Control.

Your research has been categorized as NON-EXEMPT, which means it is subject to compliance with federal regulations and University policy regarding the use of human participants as described in the IRB application material. Your protocol is approved for a period of 12 months from the date of this letter. A new application must be submitted to continue this research beyond the period of approval. In addition, you must retain all records relating to this research for at least three years after the project's completion.

Please note that it is the principal investigator's responsibility to promptly report to the IRB Committee any changes in the research project, whether these changes occur prior to undertaking, or during the research. In addition, if harm or discomfort to anyone becomes apparent during the research, the principal investigator must contact the IRB Committee Chairperson. Harm or discomfort includes, but is not limited to, adverse reactions to psychology experiments, biologics, radioisotopes, labeled drugs, or to medical or other devices used. Please contact me if you have any questions (PH# 920/424-7172 or e-mail:rauscher@uwosh.edu).

Sincerely,

Dr. Frances Rauscher
IRB Chair

cc: Roxana Huebscher
1665

INSTITUTIONAL REVIEW BOARD
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REFERENCES

Aalto, A. M., Uutela, A., & Aro, A. R. (1997). Health related quality of life among insulin-dependent diabetics: Disease-related and psychosocial correlates. *Patient Education and Counseling, 30,* 215-225.

American Diabetes Association (n.d.). Retrieved on October 10, 2009 from www.diabetes.org/diabetes-statistics.jsp

American Diabetes Association (2009). Standards of medical care in diabetes. Retrieved January 8, 2010 from http://care.diabetesjournals.org/content/32/supplement_1/S13.full#sec-14

Anderson, R. M., Arnold, M. S., Funnell, M. M., Fitzgerald, J. T., Butler, P. M., & Feste, C. (1995). Patient empowerment: Results of a randomized controlled trial. *Diabetes Care*, *18,* 943-949.

Anderson, R. M., Fitzgerald, J. T., Gruppen, L. D, Funnell, M. M., & Oh, M. S. (2003). The diabetes empowerment scale-short form (DES-SF). *Diabetes Care,* 26(5), 1641-1642.

Anderson, R. M., Funnell, M. M., Fitzgerald, J. T., & Marrero, D. G. (2000). The diabetes empowerment scale: A measure of psychosocial self-efficacy. *Diabetes Care,* 23(6), 739-743.

Burns, N. and Grove, S. K. (2003). *Understanding nursing research (3rd ed.).* Philadelphia: Saunders.

Coates, V. E., & Boore, J. R. P. (1998). The influence of psychological factors on the self-management of insulin-dependent diabetes mellitus. *Journal of Advanced Nursing, 27,* 528-537.

Comley, A. L. (1994). A comparative analysis of Orem's self-care model and Peplau's interpersonal theory. *Journal of Advanced Nursing, 20,* 755-760.

Diabetes educator (n.d.). Diabetes education. Retrieved July 9, 2009 from www.diabeteseducator.org

Diabetes monitor (n.d.). Insulin pump information. Retrieved March 4, 2010 from www.diabetesmonitor.com/b46.htm

DiMatteo, M. R. (2004). Social support and patient adherence to medical treatment: A meta-analysis. *Health Psychology, 23,* 207-218.

Funnell, M. M., & Anderson, R. M. (2000). The problem with compliance in diabetes. *The Journal of the American Medical Association, 284,* 1709-1710.

Funnell, M. M., & Anderson, R. M. (2003). Patient empowerment: A look back, a look ahead. *The Diabetes Educator,* 29(3), 454-464.

Funnell, M. M., Brown, T. L., Childs, B. P., Haas, L. B., Hosey, G. M., Jensen, B., et al., (2007). National standards for diabetes self-management education. *The Diabetes Educator, 33(4),* 599-614.

Gillibrand, R., & Stevenson, J. (2006). The extended health belief model applied to the experience of diabetes in young people. *British Journal of Health Psychology, 11,* 155-169.

Henshaw, L. (2006). Empowerment, diabetes and the National Service Framework: A systematic review. *Journal of Diabetes Nursing, 10(4), 128-135.*

Hill, J. (2007) Treating type 1 diabetes in primary care. *Practice Nurse, 33(11),* 20-27.

King, K. M. (2003). Diabetes: Classification and strategies for integrated care. *British Journal of Nursing, 12(20),* 1204-1210.

McEwen, M., & Wills, E. M. (2007). *Theoretical basis for nursing (2nd ed.).* Philadelphia, PA: Lippincott Williams & Wilkins.

McCarthy, M. J., Herbert, R., Brimacombe, M., Hansen, J., Wong, D., & Zehnan, M. (2002). Empowering parents through asthma education. *Pediatric Nursing, 28(5),*465-473.

Michigan Diabetes Research and Training Center. (n.d.). Survey instruments. Retrieved July 19, 2009 from www.med.umich.edu/mdrtc/profs/survey.html

Moser, D. K., & Worster, P. L. (2000). Effect of psychosocial factors on physiologic outcomes in patients with heart failure. *Journal of Cardiovascular Nursing, 14,* 106-115.

Murberg, T. A. (2004). Long-term effect of social relationships on mortality in patients with congestive heart failure. *International Journal of Psychiatry Medicine, 34,* 207-217.

National Institutes of Health (n.d.). Diabetes overview. Retrieved July 9, 2009 from http://diabetes.niddk.nih.gov/dm/pubs/overview/index.htm#diagnosis.

Nicoll, D., McPhee, S. J., Pignone, M., & Lu, C. M. (2008). *Pocket guide to diagnostic tests* (5th ed.). New York: McGraw-Hill.

Norbeck, J. S. (2001). 1995 scoring instructions for the Norbeck Social Support Questionnaire (NSSQ). Retrieved July 19, 2009 from http://nurseweb.ucsf.edu/www/NSSQ-Instrument.pdf

Norbeck, J. S., Lindsey, A. M., & Carrieri, V. L. (1981). The development of an instrument to measure social support. *Nursing Research, 30(5),* 264-269.

Norbeck, J. S., Lindsey, A. M., & Carrieri, V. L. (1983). Further development of the Norbeck social support questionnaire: Normative data and validity testing. *Nursing Research, 32(1),* 4-9.

Orem, D. (2001). Nursing: Concepts of practice (6th ed.). St. Louis: Mosby.

Robbins, S. P., Chatterjee, P., & Canda, E. R. (1998). *Contemporary human behavior theory.* Boston: Allyn & Bacon.

Rose, M., Fliege, H., Hildebrandt, M., Schirop, T., & Klapp, B. F. (2002). The network of psychological variables in patients with diabetes and their importance for quality of life and metabolic control. *Diabetes Care, 25,* 35-42.

Sayers, S. L., Riegel, B., Pawlowski, S., Coyne, J.C., & Samaha, F. F. (2008). Social support and self-care of patients with heart failure. *Annals of Behavioral Medicine, 35,* 70-79.

Schutt, R. K., and Rogers, E. S. (2009). Empowerment and peer support: Structure and process of self-help in a consumer-run center for individuals with mental illness. *Journal of Community Psychology, 37(6),* 697-710.

Shiu, A. T. Y., Martin, C. R., Thompson, D. R., & Wong, R. Y. M. (2005). Empowerment and metabolic control in patients with diabetes mellitus. *Clinical Effectiveness in Nursing, 9,* 88-91.

Shiu, A. T. Y., Martin, C. R., Thompson, D. R., & Wong, R. Y. M. (2006). Psychometric properties of the Chinese version of the diabetes empowerment scale. *Psychology, Health & Medicine, 11(2),* 198-208.

Sigurdardottir, A. K., & Jonsdottir, H. (2008). Empowerment in diabetes care: Towards measuring empowerment. *Scandinavian Journal of Caring Sciences, 22(2),* 284-291.

Simon, B. L. (1994). *The empowerment tradition in American social work: A history.* New York: Columbia University Press.

Solomon, B. (1976). *Black empowerment.* New York: Columbia University Press.

The Diabetes Control and Complications Trial Research Group. (1993). The effect of Intensive treatment of diabetes on the development and progression of long-term Complications in insulin-dependent diabetes mellitus. *New England Journal of Medicine, 329(14)*, 977-986.

Toljamo, M., & Hentinen, M. (2001). Adherence to self-care and social support. *Journal of Clinical Nursing, 10,* 618-627.

Trief, P. M., Ploutz-Snyder, R., Britton, K.D., & Weinstock, R. S. (2004). The relationship between marital quality and adherence to the diabetes care regimen. *Annuals of Behavioral Medicine, 27(3),* 148-154.

University of California, San Francisco (n.d.). Survey instruments. Retrieved July 19, 2009 from http://nurseweb.ucsf.edu/www/NSSQ-Instrument.pdf

University of Michigan Medical School (n.d.). Diabetes care and research at University of Michigan. Retrieved October 18, 2009 from www.medicineatmichigan.org%2Fmagazine%2F2004%2Fspring%2Fdiabetes%2Fdefault.asp&sg=Gvx5artmjY6AVlpfGW5KKgGQiQ%2FedEbGvDAuYxZC9l0%3D&tsp=1255913121198

van Dam, H. A., van der Horst, F. G., Knoops, L., Ryckman, R. M., Crebolder, H. F. J. M., & van den Borne, B. H. W. (2005). Social support in diabetes: A systematic review of controlled intervention studies. *Patient Education and Counseling, 59,* 1-12.

Warrren-Findlow, J., & Prohaska, T. R. (2008). Families, social support, and self-care among older African-American women with chronic illness. *American Journal of Health Promotion, 22(5),* 342-349.

Williams, G. C., Rodin, G. C., Ryan, R. M., Grolnick, W. S., & Deci, E. L. (1998). Autonomous regulation and long-term medication adherence in adult outpatients. *Health Psychology, 17,* 269-276.