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SELF-EFFICACY IN TYPE 2 DIABETICS

By

JOAN M. HYETT

A THESIS

Presented to the Graduate Faculty of the University of the Incarnate Word

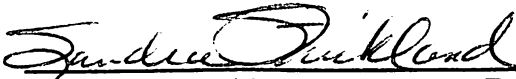
in Partial Fulfillment of the Requirements for the Degree of

MASTER OF SCIENCE IN NURSING


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December 2000

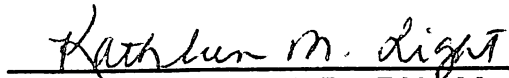
APPROVED:



Sandra Strickland, Dr. P.H., R.N., Chairperson



Dianna Tison, Ph.D., R.N., Member



Kathleen Light, Ed. D., RN., Member
Dean, School of Nursing and Health Professions

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CHAPTER 1

INTRODUCTION

Background

There are 1.2 million diagnosed diabetics in Texas, 10 % of whom live in Bexar County, Texas. Diabetes is rated as the fifth leading cause of death in the same county. In addition to the diagnosed cases, it is estimated that 125,000 adults in Bexar County have undiagnosed diabetes (Foy, 1999).

Diabetes is a chronic and debilitating disease. Some of the complications of diabetes are nerve damage (neuropathy), amputations, kidney disease (nephropathy), and blindness (retinopathy). The cost of diabetes complications impacts on the health care of the individual. The cost of the Medicare budget, for example, allots only 25% of its funds for the treatment of diabetes and its complications. Many diabetic individuals cannot afford the cost of health care. It is estimated that 85% of the chronic complications of diabetes could be reduced through prevention. This would save the Medicare budget more than \$17 billion annually (Pfeifer, 1998).

Diabetic education may prevent complications in some individuals, but sometimes knowledge alone is not enough. Patients often lack motivation or self-confidence in their capacity for self- management of their diabetes. Diabetic educators are often faced with the challenge of not only educating but also motivating patients to be compliant with their self-care. Previous research has documented that the relationship between knowledge and compliance vary

greatly (Hurley & Shea, 1992). Hurley and Shea (1992) report that knowledge alone is not a predictor of one's capacity to incorporate the necessary self-care behaviors into one's everyday lifestyle. Patients have reported that despite knowledge, sometimes the capacity to carry out a self-care program is even more stressful than the disease of diabetes itself.

The diabetic individual's life revolves around a daily regimen of precise monitoring of blood sugars and calculation of insulin doses. Meals, exercise, rest, and general activities must be planned and calculated to match those times when insulin levels are expected to drop or peak. Diabetic educators should encourage patients to assume the responsibility for their own care as much as possible. Patients should be helped to develop strategies for their own long-term diabetic care (Hurley & Shea, 1992).

Problem Statement

Do male Veterans Affairs outpatients who are diagnosed as Type 2 diabetic patients and have blood sugar levels of less than 7% on the glycosylated hemoglobin test exhibit higher scores on the Insulin Management Diabetic Self-Efficacy Scale than Veterans Affairs diabetic patients who do not have blood sugar levels of less than 7% on the glycosylated hemoglobin test?

Need for and Significance of Study to Nursing

Diabetes patients have a long-established history of nonadherence with their treatment regimen (Polly, 1992). Nonadherent behavior is thought to be related to a lack of self-efficacy (Bandura, 1997). Bandura (1997) defines self-

efficacy as “belief in one’s capacity to organize and execute courses of action required to meet given situational demands” (p.391). Previous research cites self-efficacy as the key to patients being able to better manage their diabetes (Hurley, 1990; Hurley & Shea, 1992; Polly, 1992).

According to Bandura (1997), who is the initiator of the self-efficacy concept, a diabetic patient with good self-efficacy skills appears to be more likely to exercise effective management of the disease. Some authors seem to view self-efficacy as a present, unchangeable behavior in individuals (e.g., Deci & Ryan, 1985). Bandura (1997) contends that if self-efficacy were enhanced in a nonadherent individual, self-care management skills would be beneficially improved.

Previous research, although limited, has documented that patients with high scores of self-efficacy do better in managing their blood sugar levels and appear to be more effective in managing their diabetes. They, in turn, have fewer diabetes complications (Hurley, 1990). If there is more research to document that high levels of self-efficacy are related to better diabetes control, then the diabetes nurse educator can better understand how to help patients become more effective managers of their diabetes. The diabetic nurse educator can incorporate the concept of self-efficacy into teaching patients how to develop strategies for self-care. Bandura (1997) states that certain components that make up self-efficacy can be manipulated. If this is true, the diabetes nurse educator can learn how to manipulate the components of self-

efficacy to guide patients to better manage their diabetes. Bandura believes that self-efficacy can be manipulated to be increased in patients with low self-efficacy. This could be useful for the diabetes nurse educator, who could utilize self-efficacy to improve self-management skills in diabetic individuals. It is well-documented in the literature that if one can educate people in self-management skills, one can minimize the incidence of complications (Hurley, 1990). This, then, is significant to nursing.

Theoretical Framework

This study involved the use of two theories. The first theory is Orem's (1991) Self-Care Deficit Theory of Nursing. The general focus of Orem's theory is composed of three interrelated concepts: (1) the theory of self-care, (2) the theory of self-care deficit, and (3) the theory of nursing systems. Incorporated within these three concepts are six basic concepts.

The first concept, self-care, is the performance or practice of activities that individuals initiate and perform on their own behalf to maintain life, health, and well-being. Self-care, when it is effectively performed, helps to maintain structural integrity and human functioning and contributes to human development (Orem, 1991).

The second concept, self-care agency, refers to the human's ability to engage in self-care. The human's ability to engage in self-care demands is affected by basic conditioning factors such as age, gender, sociocultural beliefs

and practices, health care system factors, and environmental factors (Orem, 1991).

The third concept, therapeutic self-care demand, is the sum of self-care actions to meet known self-care requisites or requirements by using valid methods and a related set of actions and operations. Orem (1991) defines three subcategories of self-care requisites in her theory: (1) universal self-care requisites such as maintenance of sufficient air and maintenance of sufficient food, (2) developmental self-care requisites, which are specialized requisites derived from a condition or associated with an event and include activities such as adjusting to body changes, e.g., hair loss, or adjusting to a new job , and (3) health deviation self-care, which is required in certain illness conditions, injuries, and diseases. Some examples of health deviation self-care are learning to walk with crutches following the casting of a fractured leg or learning to live with the effects of a disease (e.g., diabetes) (Orem, 1991).

Self-care deficit, the fourth concept, refers to those instances when self-care demands exceed the self-care agent's (the patient's) capacity for self-care. This is the core of the Self-Care Deficit Theory because it defines when nursing interventions are needed (Orem, 1991).

The fifth concept, nursing agency, involves the specialized abilities that enable nurses to provide nursing care. It is these specialized abilities that compensate for self-care deficit in the patient (Orem, 1991).

Orem's (1991) sixth concept is that of the nursing system, which is a system designed by the nurse. Figure 1 demonstrates the relationship between Orem's concepts of self-care abilities and self-care demands. This system describes how the self-care needs of the patient can be met by the nurse. Orem has identified three classifications of nursing systems: (1) the Wholly Compensatory System, which involves a situation in which the patient is unable to perform any self-care actions for him- or herself and is totally dependent on the nurse for care, (2) the Partly Compensatory System, which involves a situation in which the patient is able to engage in some self-care activities for him- or herself but still requires assistance from the nurse, and (3) the Supportive-Educative System, which involves a situation in which the patient is able to perform all self-care activities but may need guidance, knowledge, and skills from the nurse (see Figure 2).

The nurse's role is to promote the patient as a self-care agent. Orem (1991) discusses a three-step nursing process:

1. Evolving a nursing diagnosis and prescription, which consists of nursing assessment, diagnosis, and prescription of treatment or care needed.
2. Designing the nursing system and planning for delivery of care, which implies tailor-making the nursing system to fit the patient's needs.
3. Producing and labeling of nursing systems and planning for delivery of care.

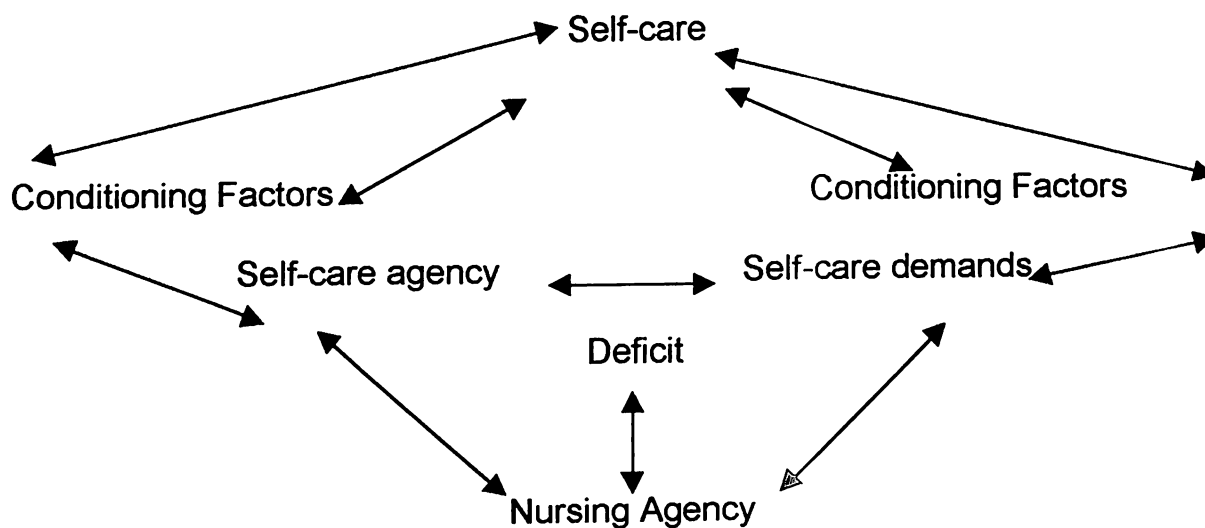


Figure 1. Orem's conceptual framework for nursing.

Note. From Nursing: Concepts of Practice (4th ed.; p.64.), by D. E. Orem, 1991, St. Louis: Mosby-Year Book. Copyright 1991 by Mosby-Year Book.

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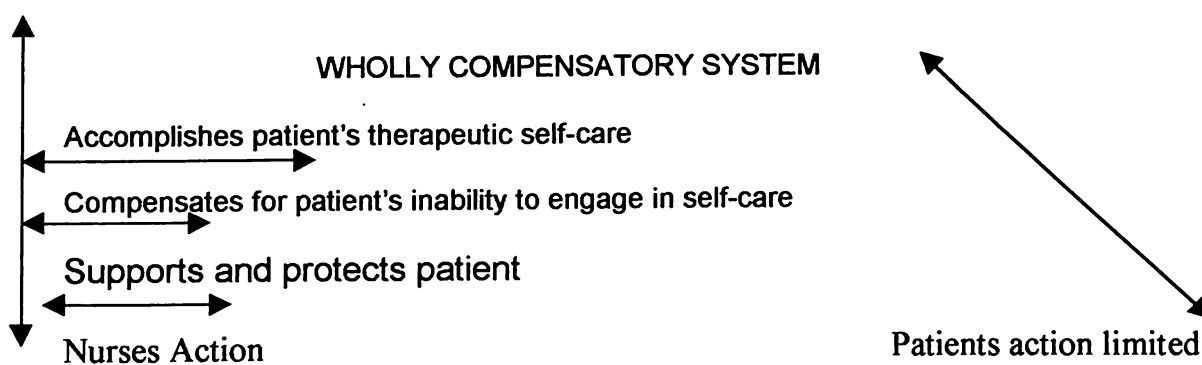


Figure 2. Orem's basic nursing system.

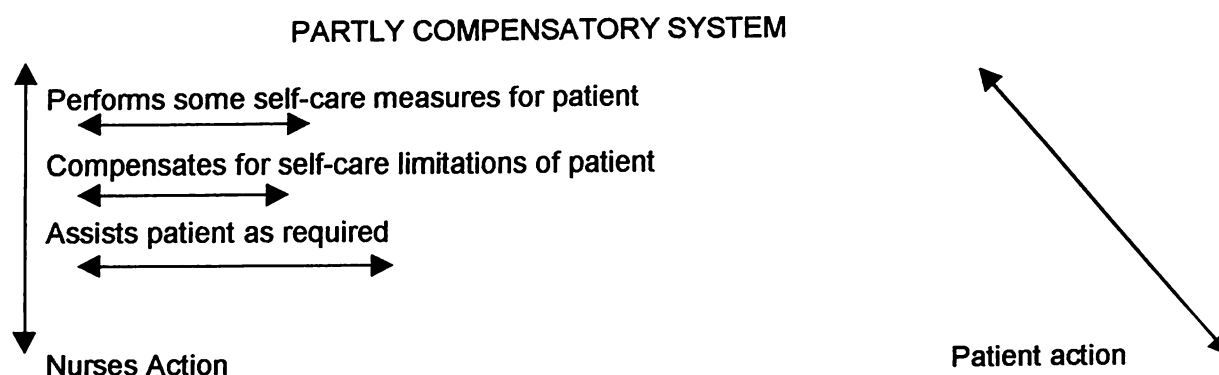


Figure 3. Orem's basic nursing system.

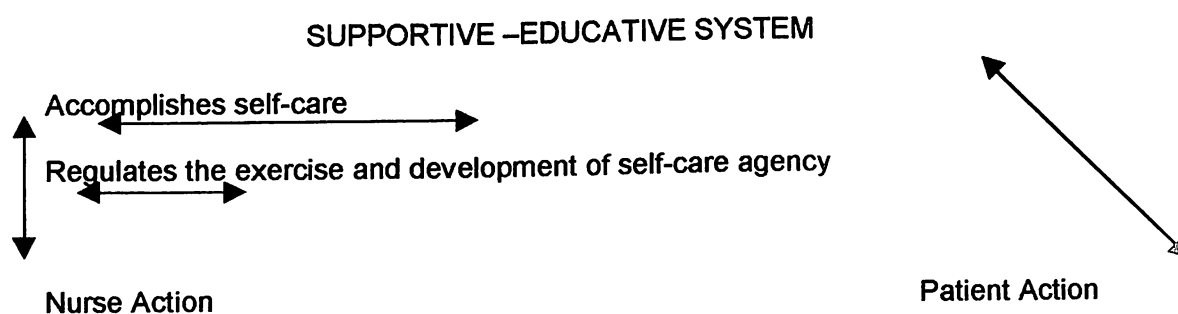


Figure 4. Orem's basic nursing system.

Note. From Nursing: Concepts of Practice (4th ed.; p. 288.), by D. E. Orem, 1991, St. Louis: Mosby-Year Book. Copyright 1991 by Mosby-Year Book. Reprinted with permission.

This encompasses interaction with the patient to evaluate and to regulate the nursing system to meet the therapeutic self-care needs of the patient.

For this study, the third system of Orem's (1991) theory, Supportive-Educative System (refer to Figure 2), was tested through the Insulin Management Diabetes Self-Efficacy Scale. In the Supportive-Educative System, the patient is doing all the self-care. The patient's agency is defined through decision-making, behavior modification, and acquisition of additional knowledge and skills. The nurse's role is to help the patient become a more effective self-care agent.

The second theory utilized by this researcher for this study was Bandura's (1997) Social Cognitive Theory. The Social Cognitive Theory proposes that the social acquisition of knowledge helps to develop the cognitive behavior process. Self-efficacy, which is the capacity to organize and accomplish a certain level of performance, is considered to be the most important concept in the Social Cognitive Theory (Hurley & Shea, 1992). Hurley and Shea (1992) state that "social cognitive theory provides the theoretical basis for the use of the self-efficacy concept to enhance diabetes self-care" (p. 146). Bandura (1997) states that the "social cognitive theory encompasses a large set of factors that operate as regulators and motivators of established cognitive, social, and behavioral skills" (p.34). There are three basic elements of the Social Cognitive Theory: (1) environmental events, (2) personal factors, and (3) behavior. These factors make up a triad known as

reciprocal causation. The three core concepts of Social Cognitive Theory are distinct yet holistic together. They interact and re-feed on each other. There is a dynamic interplay between the three core concepts. Figure 5 depicts this dynamic interplay in Bandura's Model of Reciprocal Determinism.

Bandura's (1997) self-efficacy concept is grounded in the Social Cognitive Theory. The Social Cognitive Theory purports that behavior is the result of cognitive processes through social acquisition of knowledge. Knowledge acquired through social interaction is another way of stating it. Through the social acquisition of knowledge, individuals develop their self-efficacy beliefs on the basis of four information sources. Bandura refers to these four information sources as antecedents. The first is the Enactive Attainment (EA) antecedent, which is the most important and strongest component of self-efficacy. The EA antecedent forms the information source that contains an individual's past experiences in dealing with a particular situation. Bandura states that it is documented in the literature that people generally learn from past experiences. Bandura infers that this information source helps one to develop confidence. The more experience one has in dealing successfully in a given situation, the more confident one is. It is through an individual's past experiences that mastery experiences develop.

The second antecedent that Bandura (1997) cites in his self-efficacy theory are the Vicarious Experiences (VE)'(figure 6, p.13). The VE antecedent

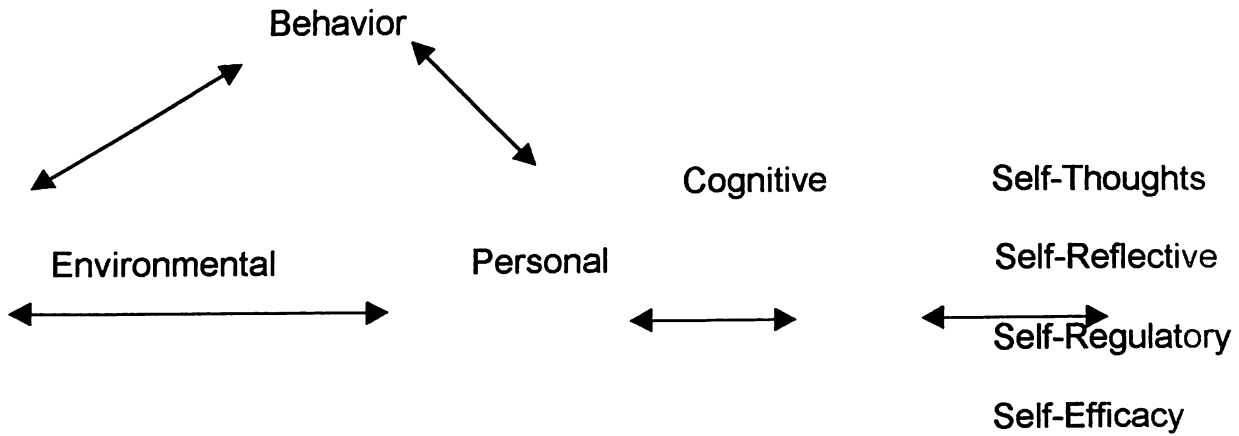


Figure 5. Bandura's Model of Reciprocal Determinism.

Note. From Self-Efficacy: The Exercise of Control (p. 7), by A. Bandura, 1997, New York: Freeman and Company. Copyright 1997 by Freeman and Company. Reprinted with permission.

represents a comparison of self to observed experiences. Bandura states that self-review of constructed capabilities raises efficacy beliefs and levels of performance.

The third antecedent of self-efficacy is Verbal Persuasion (VP). The VP antecedent refers to the concept of strengthening a person's belief that he or she possesses capabilities to achieve personal goals through social or verbal persuasion. Positive appraisal, for example, may bolster one's belief in one's capabilities (Bandura, 1997).

The fourth and last antecedent of Bandura's (1997) self-efficacy theory is the Physiologic State (PS). The PS antecedent denotes an individual's judgment of his or her capabilities relying on the person's psychological and somatic state. Bandura infers that if a diabetic individual experiences good health and wellness in managing his or her diabetes, then that makes him or her more confident in his or her self-efficacy skills. Bandura further infers that the opposite applies if the individual's health is poor while managing his or her diabetes. He or she is then likely to be less confident and perhaps feel that his or her poor health is related to his or her ineptitude in self-efficacy capabilities. These theory antecedents are depicted in Figure 6.

Summarizing the social cognitive theory, the theoretical assumptions are as follows: Behavior is learned, social interaction influences behavior, an individual learns through experience, people can anticipate the outcome(s) of action, goals can be conceptualized, and necessary steps can be planned to

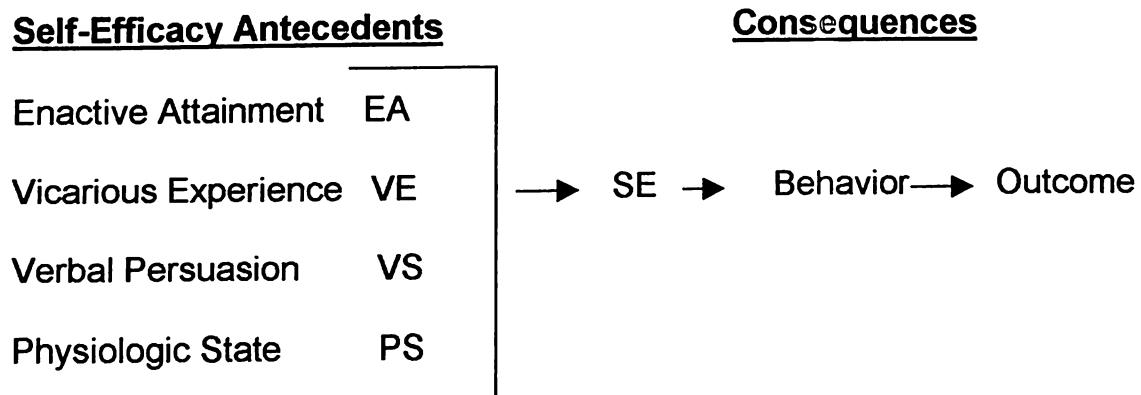


Figure 6. Four antecedents of self-efficacy and the consequences.

Note. From Self-Efficacy: The Exercise of Control (p. 80), by A. Bandura, 1997, New York: Freeman and Company. Copyright 1997 by Freeman and Company. Reprinted with permission.

accomplish those goals. Therefore, this study tested System Three of Orem's (1991) nursing process, which is the evaluation process, and Bandura's (1997) concept of self-efficacy, which is one of the key components of his Social Cognitive Theory.

Operational Definitions

The operational definitions for this study included:

- Veterans Affairs (VA) outpatients. The reference to VA outpatients in this study will denote male patients who are retired military and who attend VA hospital outpatient clinics in South Texas.
- Diabetics who take insulin. These individuals are defined as diabetic patients who take daily or twice-daily injections of insulin for life. These diabetics are Type 2 diabetics who take insulin in addition to their oral hypoglycemic medications.
- Blood sugar. Blood sugar is a fuel the body uses to run its processes. The body's cells need fuel for energy in order to survive. This fuel is usually obtained from an exogenous source such as the food people consume. This food is converted into fuel, or sugar, which travels in the blood stream and is referred to as glucose.
- Glycosylated hemoglobin test or HbA1c. It is a test that measures the glucose molecules on the red blood cells. It reveals the average blood sugar for three months because the blood cells last for 120 days in the bloodstream. The norm is HbA1c of 4.0% to 6.0%. The diabetic goal is

7% or less. Percentages above 7% are considered high (Peragallo-Dittko, 1998).

- The Insulin Management Diabetic Self-Efficacy Scale (IMDSES). The IMDSES is Hurley's (1990) modified version of Crabtree's (1986) Diabetic Self-Efficacy Scale. The IMDSES is used for measuring self-efficacy scores in diabetics who take insulin (Hurley & Shea, 1992).

Hypothesis

Male Veterans Affairs outpatients who are diagnosed as Type 2 diabetic patients and have blood sugar levels of less than 7% on the glycosylated hemoglobin test exhibit higher scores on the IMDSES than Veterans Affairs diabetic patients who do not have blood sugar levels of less than 7% on the glycosylated hemoglobin test.

Assumptions

For the purpose of this study, it was assumed that:

1. Patients who participated in this study were able to read English at least at the eighth-grade level.
2. Patients had the cognitive ability to reason and comprehend instruction.
3. Patients answered the IMDSES honestly and to the best of their ability.

Limitations

This study was constrained by the following factors:

1. All subjects might not have interpreted the wording of the IMDSES in the same way.

2. Cultural beliefs, personal beliefs, and past experiences might impact the way in which subjects responded to the items on the IMDSES.
3. The sample was one of convenient sampling.

CHAPTER 2

REVIEW OF THE LITERATURE

The review of literature includes the following topics: prevalence of diabetes by ethnic group, gender, and age; cultural and psychosocial factors; definition of blood sugar, hyperglycemia, and hypoglycemia; major forms of diabetes; glycosylated hemoglobin test; and Veterans Affairs health care system.

Prevalence of Diabetes

Diabetes is a chronic systemic disease. It consists of abnormalities characterized by hyperglycemia resulting from defects in insulin secretion or insulin action or a combination of both. It is well-documented in the literature that the symptoms of hyperglycemia include frequent urination (polyuria), excessive thirst (polydipsia), excessive hunger (polyphagia), loss of weight, fatigue, blurred vision, headaches, and poor wound healing. It is also documented that the signs and symptoms of chronic diabetes are physical growth impairment, susceptibility to infections, peripheral vascular problems leading to gangrene and limb loss, renal problems, retinal (blindness), and neuropathic syndromes. Some acute life-threatening consequences of diabetes include hyperglycemia leading to ketoacidosis, hyperglycemia hyperosmolar nonketotic syndrome, and therapy-induced hypoglycemia (Ratner, 1998).

Prevalence by Ethnic Group and Gender

Diabetes affects people of certain ethnic groups more often than other groups. It is documented in the literature that Hispanics, African Americans, Native Americans, Asian Americans, and Pacific Islanders are statistically more likely to suffer from diabetes than non-Hispanic Whites (Robbins & Two Feathers, 1998).

Hispanics. Hispanics are twice as likely to have diabetes as non-Hispanic Whites of similar age. In 1998, of the 30 million Hispanic Americans, 1.2 million were diagnosed with diabetes. Diabetes in Mexican American and Puerto Rican adults is two to three times more common than in non-Hispanic Whites. The incidence of diabetes in Cubans is lower compared to other Hispanic subgroups but still higher than in non-Hispanic Whites. There was a study, conducted by the Third National Health and Nutrition Survey (NHANES III) in 1988-1994, on the Mexican American Diabetic population. It found that their fasting plasma glucose of 126 mg/dl rose to 1% in those younger than 20 to as high as 33% for women aged 60 or more years of age (National Diabetes Clearinghouse [NDIC], 1999).

The incidence and prevalence of diabetes in Hispanics is influenced by certain risk factors that are commonly found in other ethnic groups. The first and greatest risk factor is genetics. A family history of diabetes increases the incidence that someone in the family will develop diabetes. Hispanics also inherit their risk factors from ancestral genes. They have three groups of

ancestors—(1) Spaniards, (2) American Indians, and (3) Africans—who increase their susceptibility to this disease since American Indians and Africans have high rates of diabetes (NDIC, 1999).

The second risk factor comprises medically higher than normal levels of fasting insulin (hyperinsulinemia) and the inability of the body to use its own insulin to regulate the control of blood glucose (insulin resistance). The NHANES III survey found that Mexican Americans are more prone to have hyperinsulinemia and are insulin resistant compared to non-Hispanic Whites. Hyperinsulinemia and insulin resistance are both risk factors for developing diabetes Type 2 (NDIC, 1999).

A third risk factor for developing diabetes is obesity, which is a major risk factor for developing Type 2 diabetes. Hispanics are more likely to be overweight than non-Hispanic Whites. It is documented that sub-risk factors such as diet and lack of regular exercise also play a role in obesity. A study conducted by the San Antonio Heart Study found that decreased leisure-time physical activity is related to a higher incidence of diabetes. The prevalence of Type 2 diabetes in Mexican American children who are overweight is documented in the literature as increasing (NDIC, 1999).

Diabetes complications in Hispanic Americans are more prevalent, compared to non-Hispanic Whites. A study conducted by the San Antonio Heart Study documented that the prevalence of kidney failure was higher in Mexican Americans. Mexican Americans have a higher incidence of protein in

the urine (microalbuminuria), an early indicator of kidney damage. Peripheral vascular disease and eye disease (diabetic retinopathy) have been documented to be higher in Hispanic Americans than in non-Hispanic Whites. Statistics for heart disease, which is documented as the most common cause of death in Type 2 diabetes, was significantly lower in the Texas and Colorado studies on Hispanics. Currently, diabetes educational programs are working to improve diabetes awareness and education for members of the ethnic groups hit hardest by diabetes. These programs are striving to be culturally appropriate in designing educational programs designed specifically for each ethnic group hit hardest by diabetes. Women in almost every Hispanic group were found to have a higher prevalence in comparison to men for diabetes (NDIC, 1999).

African Americans. In 1993, 1.3 million African Americans were known to have diabetes. African Americans, on the average, are 1.6 times more likely to have diabetes than Caucasians of similar age. African Americans also have a higher incidence of diabetes complications, such as kidney failure, visual impairment, and limb amputation. African Americans experience higher statistical rates for three of the most serious complications of diabetes: (1) blindness, (2) amputations, and (3) end-stage renal disease (Robbins & Two Feathers).

Subgroups of African descent who immigrated to the United States are more at risk for developing diabetes later on in life when they start to eat the traditional African American foods in the Black culture. This is most often seen

in the children of immigrants who discard their parents' traditional foods in favor of the popular foods of the African American culture. The American Diabetes Association in 1998 created an African American Program to foster greater awareness of and educate Blacks about diabetes. Groups such as churches, 100 Black Men, and Chi Eta Sorority are actively involved in educating the Black community through health fairs, seminars, workshops, community events, and newsletters (Flores & Bryant, 1997; Waters, 1994).

In a study of immigrants from Honduras who are of African descent, walking everyday was the most common means of transportation. The foods eaten were mostly fish, fresh fruits, and vegetables that were easily accessible and plentiful in Honduras. However, when immigrating to New York, the environment changes. People take buses and trains if they do not have a car as a common means of transportation. This results in less exercise. The availability of certain foods changes. Fish is expensive to buy and fresh fruits and vegetables are not readily available, and if they are, they are expensive (Waters, 1994).

A difference in the environment can also be a factor that leads to poor health. In many documented studies, poverty and obesity are linked together as risk factors for developing diabetes. Socioeconomic status of the family affect access to healthier foods. Healthier foods, like lean cuts of meats, fruits, and vegetables, tend to be more expensive in some neighborhoods. Middle to

low-income Black families are more likely to turn to foods high in fat, which tend to be less expensive (Waters, 1994).

Black females have the highest risk for developing diabetes. (Flores & Bryant, 1997). African American women are more likely to be overweight than white females, and obesity is a leading risk factor in developing diabetes. Black females are historically seen as being the backbone of the family. The woman is often the family's major source of financial support. Often, the African American mother is busy cooking and cleaning for her family while at the same time working full-time to financially support the family. All of this is done to maintain the family; therefore, she has little time for herself so exercise and healthy eating are not considered priorities. Exercise is more of a leisure-time activity and healthy food, an unnecessary expense. The stress of daily living is also documented as a risk factor for African American women. Some Blacks state that it is hard to change their lifestyle while having the responsibility of employment, discrimination, housework, and taking care of children, grandchildren, and elderly parents. Some find cooking two separate meals, one for the family and one for themselves, stressful, time-consuming, and expensive for their lifestyle. Unfortunately, according to Waters (1994), it is a vicious cycle that perpetuates itself.

Native Americans. Among Native Americans, diabetes is also a major health problem. On the average, Indians are twice as likely to die from diabetic complications as are non-Hispanic Whites. The prevalence of diabetes differs

among tribes and pueblos. The prevalence is 12.7% among the plains tribes, 10.5% among the Southwest tribes, 9.3% among the woodland tribes, and 4.5% among the Pacific Coast tribes (American Indian Health Council [AIHC], 1998). "The Pima tribe in Arizona has the highest rates in the world for diabetes" (Robbins & Two Feathers, 1998).

Risk factors such as genetic markers, dietary patterns, obesity, and sedentary lifestyles, common in Hispanics and Blacks, is also responsible for the onset of diabetes in Indians. American Indians die from diabetic complications that are similar to those in Blacks and Hispanics. Researchers cite lifestyle shifts away from traditional tribal foods and activities as part of the problem. As with the African American group, American Indian programs are trying to educate and encourage a return to a more active lifestyle and healthier eating. Community leaders in the American Indian population are being educated about diabetes and sent back into their community to educate their tribal groups on diabetes care and prevention. The prevalence of diabetes among the Indians is also more common in the female (10.1%) than in the male (7.7%) (AIHC, 1998).

Other Ethnic Groups. Asian Americans and Pacific Islander Americans likelihood of contracting diabetes is higher than that of non-Hispanic whites. Filipinos have the highest prevalence of diabetes out of the four major Asian groups: (1) Chinese, (2) Filipino, (3) Japanese, and (4) Korean. The gender prevalence for diabetes is higher in Asian and Pacific Islander males than in

Asian and Pacific Islander females (Robbins & Two Feathers, 1998). It was shown in data collected between 1988 to 1995, that Hawaiians are twice as likely to have diagnosed diabetes compared to white residents of Hawaii. Other studies showed that second generation Japanese Americans who live in the United States are likely to have diagnosed diabetes. Alaskan Natives are also at risk for developing diabetes (NIDDK, 1999).

Prevalence by Age

Statistics show that nearly 40% of those 65 to 75 years of age develop diabetes. People are living longer, and with advancing age, the pancreas starts to slow down the secretion of insulin or the insulin secreted is ineffective. An increasing number of individuals may be affected due to rising glucose intolerance. The body then becomes insulin resistant and hyperglycemia occurs. This partly accounts for the development of diabetes late in life. The elderly receiving oral hypoglycemic agents for their hyperglycemia may be at risk for medication-induced hypoglycemia.

The cause of diabetes in the elderly may include the following conditions: slow renal excretion, slowed intestinal absorption, and slowed hormonal counter-regulation or polypharmacy. Polypharmacy, which is seen most often in the elderly, occurs when the patient is on multiple prescription drugs. These drugs may interact with each other to mimic or cause hypoglycemia or other problems.

It is important to treat the hypoglycemia. Hypoglycemia can result in fatal strokes or myocardial infarcts in the elderly. It is so important for the elderly to check their blood sugar and have an appropriate snack before bedtime to prevent nocturnal hypoglycemia (Nettles, 1998).

Elderly diabetics are at risk for a higher incidence of accelerated development of long-term diabetic complications than the younger population. Amputations are twice as common in the elderly over 65. Myocardial infarction, vision loss, and diabetic nephropathy are more likely to occur in the elderly. Elderly diabetics are hospitalized more frequently than younger diabetics. The cost of hospitalization makes up 40% of all care for people with diabetes. The key educational considerations of the elderly are:

- To anticipate special needs of the elderly.
- To assess each patient individually.
- To modify instructions so that key points are in simple terms and easily read and heard at a slower pace.
- To evaluate cost, accessibility, support systems, and effects on quality of life.
- To help elderly patients recognize realistic goals and outcomes.

Cultural and Psychosocial Factors

Cultural and religious beliefs influence the individual's self-management of their diabetic care. The Hispanic culture may rely on the 'curandero' for help with their diabetes. A curandero is a person who practices the art of folk

healing or 'curanderismo.' This person can be male or female who claims to possess skills or powers to heal the sick and treat those illnesses cause by witchcraft or the evil eye (mal ojo). The cuandero may prescribe herbal remedies or perform religious rituals. Curanderismo is usually practiced by Texas Hispanics (Graham, 1999). However a person from the Black culture, or another culture may feel they don't have the time or money to engage in what may be considered frivolous self-care management of their diabetes, because they have to work to support their family. These views are not necessarily the beliefs of all Hispanics or Blacks but merely a generalization of what is already documented in the literature. In another cultural or religious group it may be to do nothing because the belief is that of divine intervention and to interfere would be considered sinful. It is well documented in literature that certain religious groups, the Jehovah Witness for example, may refuse most medical interventions. There have been some documented cases where death has occurred as a result of refusing care because of religious beliefs. This may pose a problem to the diabetic individual who is a member of a certain religious group that does not believe in the daily diabetic self-care regimen. This could pose a barrier to learning and self-care. Barriers to learning should be assessed. Cultural appropriateness should be considered in diabetic teaching. The diabetic educator may need to work with an interpreter or be bilingual in order to communicate effectively to some cultural or ethnic groups. The planning of diabetic meals may need to be culturally appropriate to the individual's lifestyle.

Cultural and religious beliefs are factors to consider when developing a more effective plan of care and educational strategy for the diabetic individual (Robbins & Two Feathers, 1998).

Psychosocial assessment is important to consider in determining the individual's capacity to manage their diabetes effectively. Psychosocial influence on behavior may be assessed utilizing several published assessment tools. Self-efficacy is one of the important psychosocial assessments to consider. Work performed by Peyrot and Rubin (1995), on self-efficacy, demonstrated that a person's intention to change in diabetic self-care behavior predicts how well one manages one's care later.

Some of the literature shows that past research on self-efficacy by Bandura (1990), Crabtree (1986), Hurley (1990), Peyrot & Rubin (1998), and many others has demonstrated the importance of self-efficacy in diabetes and in other studies that is not always the case. Pender, in 1996, cites inconsistencies of performance in some studies on perceived self-efficacy and implies that data failed to explain specific health behaviors and affirms their direction was something other than predicted. Other psychosocial factors include the health status of some diabetic individual's which may be too poor for them to effectively manage their diabetes. Another factor involves assessment for adequate patient social support systems. Patients too ill or overwhelmed may need other support systems, a family member, a friend and/ or a visiting

nurse to assist with the care. Peyrot & Rubin credit social support as a way to help buffer the stress of everyday living with diabetes (1998).

The stress of the rigorous daily self-care management of diabetes may prove overwhelming for some diabetic individuals and depression may set in. Patients who become depressed may lack the motivation to take care of their diabetes effectively. Depression could also lead to alcohol or drug abuse and the patient may exhibit neglect in their self-care.

Other factors include the patient's 'Locus of Control.' The Locus-of-Control-Theory is an individual's proposed belief in who or what controls their outcome in a disease/ or illness state. This theory is composed of three sub-concepts called orientations. Internal orientation is when an individual believes his diabetes-related outcome is controlled primarily by himself. The next is powerful other orientation which is when an individual believes his diabetes-related outcome is controlled primarily by other people, generally healthcare providers, doctors, and nurses. The final sub-concept of chance orientation is when people believe their diabetes- related outcomes are controlled primarily by chance, or divine fate.

The readiness of an individual to make lifestyle changes is an important factor to consider. Economics is an another psycho-social factor that may determine if the patient can afford to purchase the necessary equipment to manage his diabetes and adequate health insurance to meet the cost of hospital and outpatient treatment care. Then there is the factor of adequate

transportation to the nearest health care facility and clinic. Some patients may miss clinic appointments because they live too far and/or have no means of transportation. In retrospect many factors, self-efficacy, stress, depression, social support, locus of control, readiness to change, and socio-economics, all appear to play a role in how one manages one's diabetes (Peyrot & Rubin, 1998).

Definition of Blood Sugar, Hypoglycemia, and Hyperglycemia

In the normal human body, the food which the body consumes is converted into glucose. This glucose is a kind of sugar that travels into the bloodstream. The beta cells in the pancreas secrete insulin. This insulin is needed to carry the glucose from the blood to the cells. The cells need the glucose for energy or fuel in order to function. The pathogenic process in the development of diabetes involves impaired function of the beta cells in the pancreas. The cause could be viral, immune-mediated, or genetic-based beta-cell dysfunction or the disease could be acquired through environmental factors (Ratner, 1998).

The normal blood glucose (sugar) levels before eating are between 80 and 115 mg/dl. After eating, the normal glucose levels are 80 to 160 mg/dl. The insulin and the blood glucose derived from food work together to provide the cells with energy. The glucose levels in the blood stream increase after a meal. The insulin lowers the blood glucose level by helping the glucose into the cells.

There are many conditions that affect the levels of glucose in the bloodstream, such as eating, exercise, and illness. Exercise and insulin are key factors in decreasing the levels of glucose in the bloodstream (Gonder-Frederick, 1998).

A decrease in blood (serum) glucose below 70 mg/dl is defined as hypoglycemia. However, the low blood sugar level in which hypoglycemia occurs may vary in each individual. Some individuals may experience hypoglycemia with blood sugars of 90 mg/dl. Concurrently, the severity of hypoglycemia is not defined in absolute blood sugar levels. Hypoglycemia is defined when it becomes symptomatic. Some of the symptoms of hypoglycemia are fatigue, headache, sweating, shaking or trembling, hunger, nausea, slowed thinking, trouble concentrating, dizziness, anxiety, and death in severe cases. The factors that increase the risk for hypoglycemia are insulin overdose, skipping meals, and failure to recognize increased calorie demand with increased physical activity. Other factors that increase risk for hypoglycemia are age and polypharmacy. Treatment consists of proper nutritional support to meet caloric demands and patient education (Gonder-Frederick, 1998).

Hyperglycemia is a condition in which there is a large volume of circulating blood glucose in the blood stream. Hyperglycemia starts at levels above 140mg/dl. The characteristic symptoms of hyperglycemia are polyuria, polydipsia, polyphagia, and weight loss. Some additional signs and symptoms include weakness, lethargy, malaise, dehydration, headache, nausea, vomiting,

abdominal pain, and respiratory difficulty. Hyperglycemia in severe cases can mimic other diseases. The symptoms of abdominal pain can lead to an acute abdomen, which can mimic gastroenteritis or appendicitis. It can cause behavioral changes, which might mimic drunkenness. In addition, orthostatic hypotension can be mimicked through prolonged dehydration of the patient (Davidson & Schwartz, 1998).

Symptoms of prolonged hyperglycemia can lead to diabetic ketoacidosis (DKA). The symptoms of DKA are hyperglycemia, ketosis, dehydration, and electrolyte imbalance. The blood glucose level in DKA is greater than 200 mg/dl. It is documented that lower levels have been found in children, pregnant women, and patients vomiting. The mortality rate is 10%, with most deaths occurring in the elderly due to their multisystem problems, which lead to complications. Children who die from DKA do so primarily as a result of cerebral edema. The goal of treatment of DKA is to (1) correct fluid and electrolyte imbalances, (2) provide insulin to restore and maintain normal serum glucose and correct acidosis, and (3) provide preventive measures to circumvent complications. Those preventive measures include cardiac monitoring. Serial EKG monitoring may reflect cardiac dysrhythmias which were caused by electrolyte imbalances. An electrolyte imbalance, such as potassium, can lead to life-threatening cardiac irregularity. Potassium (hypokalemia) levels less than 3.5 can lead to death if not treated immediately. Potassium-replacement therapy is based on serial serum levels. Phosphate

levels should also be monitored. Some experts recommend replacement of phosphate levels less than 1.5 with potassium phosphate. Most cases of DKA can be prevented through diabetic education, planning, and rapid treatment of the patient and family (Davidson & Schwartz, 1998).

Hyperglycemic hyperosmolar nonketotic syndrome (HHNS) is another complication of diabetes. The mortality rate is higher in HHNS than in DKA. The prognosis of mortality for HHNS is 10% to 20% versus 3% to 10% in DKA. HHNS is manifested by absence of ketosis, profound dehydration, severe hyperglycemia, and neurologic manifestations. Neurologic changes may exhibit themselves as lethargy and mild confusion. Patients with HHNS may also manifest focal neurologic symptoms, hemiparesis, aphasia, and seizures that mimic a stroke. Typical laboratory values exhibit a glucose level of less than 800 mg/dl. There is an absence of ketone bodies in the blood or the urine except in small amounts. Serum and urine osmolarity is markedly elevated. Treatment of HHNS includes four goals: The primary goal is rehydration, or the replacement of volume loss. Second, insulin is administered to restore normal serum glucose levels. Third, every effort is made to prevent complications, and, fourth, intense patient and family education is undertaken (Davidson & Schwartz, 1998).

Major Forms of Diabetes

The terminology used in the classification of diabetics was revised in 1997. The terms insulin-dependent diabetes mellitus or Type I diabetes and

non-insulin-dependent diabetes mellitus or Type II diabetes have been eliminated. The Arabic numerals have replaced the Roman numerals. The major forms of diabetes are now referred to as Type 1 and Type 2 (Ratner, 1998).

Type 1 Diabetes

Type 1 diabetes, or insulin-dependent diabetes mellitus, develops at any age, but most cases occur before age 30. This used to be called juvenile diabetes because it was most frequently diagnosed during the childhood-teenage years or the juvenile years. The pathophysiology of Type 1 diabetes occurs when the beta cells in the pancreas are unable to secrete insulin. Therefore, the body is dependent on receiving exogenous sources of insulin for life in order to prevent ketoacidosis, leading to death. The exogenous source of insulin is supplied by daily or more frequent injections of insulin to sustain life (Ratner, 1998).

Ratner (1998) describes five stages in the development of Type 1 diabetes. These stages are:

1. Stage 1. Genetic predisposition. This is a genetic predisposition in which Blacks, Hispanics, and Asian Americans are more likely than non-Hispanic Whites to develop genes for Type 1 diabetes.
2. Stage 2. Environmental trigger. Viral environmental triggers can be congenital rubella syndrome and the Coxsackie B4 infection. The bovine serum albumin is thought to be another environmental trigger for Type 1

diabetes. Additional environmental triggers are the sex steroids seen in puberty and during pregnancy. There are also environmental toxins, such as pesticides, rodenticides, vacor, and N-nitroso derivatives that can also damage the beta cells in the pancreas, leading to Type 1 diabetes.

3. Stage 3. Active autoimmunity. This stage consists of a faulty immune system in which one's own antibodies attack the beta cells themselves or the insulin secreted by the beta cells, with a resultant diminishment of the effectiveness of the circulating insulin in the body. People with high islet cell antibody titers usually develop Type 1 diabetes within five years.
4. Stage 4. Progressive B-Cell dysfunction. In this stage there is a progressive deterioration of the B-cells' functional capabilities.
5. Stage 5. Overt diabetes mellitus. This is a stage in which the clinical onset of diabetes may be abrupt. It is usually precipitated by stress or acute illness.

Type 2 Diabetes

Type 2 diabetes occurs when the beta cells in the pancreas produce some insulin but not enough. It is the limitation of the beta cells' response to hyperglycemia or high blood sugar. There is a 50% reduction in beta cell function. Type 2 diabetes has also been described as the insulin resistance syndrome. Type 2 is characterized by variable beta cell function and insulin

resistance. "Limitation in the B-cell response to hyperglycemia appears to be the cornerstone of the pathophysiology of Type 2 diabetes" (Ratner, 1998, p. 180). It is well documented in the literature that Type 2 diabetes usually occurs after age 40. However, Type 2 diabetes can occur at any age. There has been an increase in Type 2 diabetics in the general population. Many of the elderly or the obese are now being diagnosed as having Type 2 diabetes. Many Type 2 diabetics take insulin in addition to their oral hypoglycemic agents. Individuals with Type 2 diabetes may need insulin as an adjunct therapy if oral hyperglycemic agents do not adequately control the blood sugar level (White et al., 1998). It is also documented in the literature (Ratner, 1998) that strict serum glucose control and diabetes management are indicated in all diabetics.

Glycosylated Hemoglobin Test

The glycosylated hemoglobin (GH) testing, or HbA1c, measures the number of glucose molecules attached to the hemoglobin component of the red blood cells. Glycosylation occurs as the glucose in the plasma attaches itself to the hemoglobin in the blood cell; this process is irreversible. Because the blood cells remain in the bloodstream for 120 days, the GH test is a more accurate objective measure of glycemia over three to four months in persons with diabetes. The GH test measures the glucose molecules on the red blood cells in percentages. The percentages are written as an HbA1c of 5% or 8%. If the HbA1c is less than 7% on the GH test, the patient has been managing his or

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her glucose levels well. However, an HbA1c of greater than 7% represents a high level, which indicates poor self-management of blood glucose (SMBG). The recommended testing is every three months. This test was chosen for this study because “the glycosylated hemoglobin test is a strong indicator of blood glucose control when compared with SMBG results . . . [and] is a teaching tool as well as a marker of metabolic control” (Peragallo-Dittko, 1998, p.371).

Blood sugar levels alone do not give an accurate account on how well a patient has been managing his or her diabetes over several weeks. The patient who has poorly managed his or her diabetes can decide to do so the day before his or her doctor’s appointment, thereby providing a false reading. The blood glucose levels, although they give a view of the glucose levels for that moment, do not give an accurate account of what the glucose level has been over the previous three to four months. However, the blood glucose level is still a good test. The blood sugar levels should not be taken lightly (Peragallo-Dittko, 1998).

Veterans Affairs Health Care System

A history of the Veterans Affairs Health Care System is presented to help the reader better understand the mission of the institution where the research was conducted. This history attempts to give insight into the veteran population and the Veteran Affairs Program and institution that serve them.

The roots of the VA Health Care System can be traced back as far as 1776, when the Continental Congress of 1776 provided pensions for soldiers of

the Revolutionary War who were disabled during the war under the Veterans Assistance Program. The Federal Government in 1811 authorized the first medical facility for Veterans. In the nineteenth century, the Veterans Assistance Program was expanded to include the widows and dependents of veterans. When the United States entered World War I in 1917, Congress established a new system of veterans' benefits. The benefits included programs for disability compensation, insurance for service-connected persons and veterans, and vocational rehabilitation for disabled veterans (Department of Veterans Affairs [DVA], 2000a, b, & c).

The establishment of the Veterans Administration came into law in 1930, when Congress authorized President Herbert Hoover to consolidate and coordinate government activities affecting war veterans. Brigadier General Frank T. Hines directed the first Veterans Bureau for seven years until 1945. The Veterans Bureau had, by that time, grown from 54 hospitals in 1930 to 171 medical centers, more than 350 outpatient, community, and outreach clinics, and 126 nursing home care units (DVA, 2000a).

With the advent of World War II, the veteran population dramatically grew and a new set of benefits were developed. The World War II G.I. Bill was signed into law on June 22, 1944. Additional educational assistance benefits were developed into law for the veterans of the Korean Conflict, the Vietnam War, the Persian Gulf War, and the All-Volunteer Force. The Department of Medicine and Surgery was established in 1946. It was called the Veterans

Health Services and Research Administration in 1989. It was renamed the Veterans Health Administration in 1991. Legislation to elevate the Veterans Health Administration to Cabinet status was signed by President Reagan in 1988. President Bush, in 1989, established the Department of Veterans Affairs as a Cabinet-level position (DVA, 2000a & b).

The South Texas Veterans Health Care System--Audie L. Murphy Division (STVHCS-ALMH), where the research was conducted, began its operations in 1973. Its affiliation with its neighbor, the University Hospital in the Medplex Center, occurred the same year. The hospital is comprised of 434 operating beds, a 90-bed extended care therapy center, and a 30-bed state-of-the-art spinal cord injury center. The hospital provides such tertiary care services and technology as bone marrow transplantation, open-heart surgery, magnetic resonance imaging, and positron emission tomography. The STVHCS-ALMD was honored by the Under-Secretary of Health with the two Programs of Excellence--(1) the Health Care for Homeless Veterans Program and (2) the Cardiac Surgery Program. This hospital is a Level II research facility that conducts research on aging, cardiac surgery, cancer, diabetes, and more. The hospital is named after the most decorated World War II hero, Audie L. Murphy, who briefly became a movie actor after the war (STVHCS-ALMD, 2000).

The satellite clinic where the research was conducted also was named after a veteran, Senator Frank Tejeda. This native San Antonian Hispanic male

served in the corps in Vietnam. He was awarded the Silver Star and the Bronze Star for valor as well as the Purple Heart. He held many official positions and was elected to the United States House of Representatives in 1992, where he served from 1993 to 1997. He introduced and helped to pass many state and federal legislative bills to expand the veterans educational and health benefits. He died in 1997 of a brain tumor (STVHCS-ALMD, 2000).

It is estimated that, as of July 1, 1997, the general veteran population is about 25.6 million. It is further estimated that 80 of every 100 living veterans served during periods of armed hostilities ("Vietnam Warriors," 1998). The male gender primarily dominates the veteran population, but the female veteran population began to increase during the Vietnam era (Veterans Health Administration, 2000). VFW Magazine states that "7,484 women (6,250 or 83% were nurses) served in Vietnam." Although the number of female veterans has increased over the years, especially during the Desert Storm War, the female veteran population still remains the gender minority ("Vietnam Warriors," 1998).

The ethnicity of the veteran population at STVHCS-ALMD and its satellite clinic in San Antonio is estimated to be 50% Caucasian, 35% Hispanic, 10% African American, and some 5% miscellaneous ethnic groups. Precise statistical data were unavailable to this researcher, despite consultation and computer library search.

Diabetes Nurse Educator Mary Ann Morgester (2000) at the STVHCS-ALMD and Diabetes Nurse Educator Dora Santiago (2000) at the Frank Tejada

Outpatient Clinic in San Antonio, Texas, in interviews stated that elderly Type 2 diabetics appear to be the most prevalent diabetic group at these two facilities. Further, many of the Type 2 diabetics are using insulin in addition to their oral hypoglycemic agents.

Summary

In summary of the review of literature there are several points and concerns to this study. The predominantly World War II veteran population at this South Texas Veterans Administration is generally over the age of 65 years of age and Hispanic. Cultural considerations and psychosocial factors impact on possible barriers to learning in diabetic teaching. Cultural appropriateness and psychosocial factors should be considered in diabetic teaching plan. The literature review touches on genetics, lifestyle habits, insulin resistance, and advancing age in relation to possible causes of developing diabetes. A clarification of the terms blood sugar, Type 1 and Type 2 and glycosylated hemoglobin is also provided. The last discussion focuses on the history of the Veterans Affairs health care system to help the reader better understand the mission and goals of the institution where the research is to be conducted.

CHAPTER 3
METHODOLOGY
Research Design

This study used a nonexperimental, ex post facto design. A nonexperimental design was utilized because there would be no interventions and no manipulation of the variables or the subjects in this research. The subjects filled out a survey scale (the IMDSES) and rated their responses on a Likert scale. The purpose of this study, as stated in the hypothesis, was to determine if there is a correlation between self-efficacy scores on the IMDSES and blood sugar levels on the glycosylated hemoglobin test.

Setting

The study was conducted in a 434-bed VA hospital which has a diabetic outpatient clinic and a diabetic satellite clinic division located in the southwestern part of the US. The hospital functions as a teaching institution and is affiliated with a large Health Science Teaching Center located in the same metroplex.

The physical setting in which the IMDSES questionnaire was completed was the clinical waiting area or the patient's assigned exam room. These areas both have comfortable cushioned chairs in which to sit. The exam room has a desk as well as a chair. Both clinic areas have adequate utilities such as air-conditioning, heating, and lighting. Each patient was made as comfortable as physically possible.

Sampling and Sample

The target population were male Type 2 diabetics from the V.A. Hospital. The convenience sample included patients from the diabetic outpatient clinic of this hospital and a nearby satellite clinic. The researcher went to the clinics and selected the sample out of the daily computer clinic printout sheet for that day. The researcher then approached those patients in the waiting area who met the criteria of the study and asked their permission to fill out an inclusion criteria sheet. If they agreed to participate in the study and met the inclusion criteria, they were instructed by this researcher to complete the questions on the IMDSES. The researcher was not able to employ the diabetes nurse educator or the registered nurses in the clinics to assist her by passing out questionnaires and explaining the process, because of the busy workload of the clinic, so all data collection was done entirely by the researcher. This process was repeated until convenient samples of a minimum of 31 patients were recruited for this study.

Inclusion Criteria

Those individuals selected to participate in this study were:

1. Male in gender.
2. Diagnosed with diabetes for 3 months or longer.
3. Presently taking insulin.
4. Over 18 years of age.

5. Able to comprehend spoken and written English.
6. Able to have a glycosylated hemoglobin test lab result within the last three months to be determined through the clinic printout sheet.
7. Able to have no stated or diagnosed history of psychological problems: post-traumatic stress disorder, bi-polar disorder, anxiety and/or nervous disorders, schizophrenia, or paranoid disorders as determined through the record by the researcher prior to handing out the questionnaire.

Protection of Human Subjects

To protect the human rights of the participants, permission to conduct the study was obtained from the Institutional Review Board (IRB) of the University of the Incarnate Word and the IRB of the agency in which the study was done. Involvement in this study did not represent any appreciable risks to the physical or the psychological safety of the participants. All participants were informed that they might withdraw from the study at any point. The subjects were given a consent form to read. The consent form identified the researcher and provided a brief description of the research study. Confidentiality statements and statements about physical and psychological safety were also included as well as statements about the right to withdraw, and who to call for questions. If they agreed to the terms on the consent forms they were required to sign the form to participate in the study. Each participant received a copy of their signed consent.

Participation in this study was known only to the participants and this researcher. The questionnaires once completed, remained anonymous with no identifying marks. A ballot box-type container with locks was provided in each VA diabetic outpatient clinic to collect the questionnaires upon completion. This researcher was in possession of the only key to the box. The ballot box was carried to each participant. The box was opened only after all the appropriate number of questionnaires had been collected.

Participants were verbally informed that a summary of the study when completed would be provided upon request. The subjects were assured that this study would not jeopardize their health care service through this institution in any way whether the client consents or declines to participate.

Instrumentation

The instruments used for this study were the Insulin Management Diabetic Self-Efficacy Scale, the Demographic Sheet and the Glycosylated Hemoglobin test.

The IMDSES

The specific purpose of the IMDSES (see Appendix A) is to measure self-efficacy in clients with diabetes who use insulin. Written permission has been obtained to use the IMDSES (see Appendix B).

The reliability of the (IMDSES) is reported to be a Cronbach alpha of .82, which is an adequate instrument reliability estimate for a Likert scale. It is reported that evidence of internal consistency of the IMDSES was confirmed by

a theta coefficient of .87, interpreted as a maximized alpha coefficient and additional evidence of internal consistency (Carmines & Zeller, 1979).

Hurley (1990) reports evidence of convergent validity or construct validity of the IMDSES utilizing two measures, (1) the IMDSES and the (2) glycosylated hemoglobin test or HBA1c. A correlation matrix of IMDSES and GH was done. It is reported that there was a negative correlation between GH and IMDSES.

The following associations were revealed using the Pearson correlation:

IMDSES/GH $r = -.1738$, $n = 113$, $p = .033$. The reported results were that a higher score on the IMDSES predicted low levels of GH. These results indicate that high scores on the IMDSES demonstrate better self-control of GH levels.

A maximum high score of 98 can be achieved from the twenty-eight items on the questionnaire. A breakdown of the scores would reveal that scores in the 90's are considered high, scores in the 80's are medium high, and medium low scores are in the 70's, with a cut off point at 70. Scores below 70 would be considered low scores. The IMDSES contains three internally consistent subscales: (1) general alpha of .86, (2) diet alpha of .78, and (3) insulin alpha of .77. Alpha values of the exercise and foot care items were not included because they had too low a number to have subscales according to Hurley (1990).

The IMDSES is a paper-and-pencil questionnaire which is easy to use and is self-administered. It requires less than 15 minutes to complete. The scale consists of 28 items. Of these 28 items, 18 are positively worded and 10

are negatively worded. The 18 positively worded items are reversed scored. The positive worded reversed score item, "I can carry out practically all the self-care activities in my daily diabetes routine," uses a Likert rating scale ranging from 1- Strongly agree to 6- Strongly disagree". The Likert rating scale of 1- Strongly agree, carries the most points for this positive worded item which is reversed scored. A negatively worded item, "I don't think I can follow my diabetes routines every single day," with a Likert rating also of 1- Strongly agree to 6- Strongly disagree" and the response that carries the most points for this negatively worded item is 6- strongly disagree. The questions are also close-ended with the opportunity for open-ended comments at the end of the test. The questions cover seven areas of diabetic behavior: (1) general, (2) diet, (3) exercise, (4) foot care, (5) monitoring, (6) insulin administration, and (7) detection, prevention, or treatment of high and low blood glucose reaction. It uses a Likert rating scale ranging from 1—Strongly Agree to 6—Strongly Disagree. The response of Not Applicable, listed as NA, is also available. The respondent has to circle the most appropriate response. The researcher had included all the responses on the questionnaire.

The Demographic Data Sheet

This included data such as when first diagnosed with diabetes and type, age ranges, and the results of the most recent glycosylated hemoglobin test. These variables are needed to verify eligibility for participation in the study prior to handing out the questionnaire. The researcher determined eligibility.

The Glycosylated hemoglobin test

This was collected from the most recent 3-month test results. This test showed the blood sugar level over the past three months (see p. 32-33). The most recent GH was collected from each patient's lab records. The IMDSES score of each patient was calculated. The Pearson correlation coefficient of IMDSES scores and GH levels and/or HbA1c percentages was determined. The hypothesis that low levels of GH indicate higher scores of self-efficacy was tested by determining if the Pearson correlation coefficient is negative and significantly different from zero.

Data-Collection Protocol

This researcher used two tools for data collection. These were (1) the demographic sheet to determine the patients eligibility to be included in the study and (2) the IMDSES, which is a questionnaire to test scores of self-efficacy.

When the participants came for their clinical appointments, this researcher reviewed the appointment sheets and met each person eligible to participate in this diabetic research project. This researcher stated that she was asking them to participate because they were diabetic patients in the Veterans Administration system. The researcher stated that if they decided to take part, they would be asked to fill out a 28-item questionnaire about diabetes. This task would take approximately fifteen minutes of their time. This researcher informed

the participants that the results of their most recent HbA1c results would be obtained from their medical records. The researcher stated that everything that was learned about them in this study would be strictly confidential. The researcher also stated that there was no monetary gain or compensation for participation and that the participant was free to choose not to take part in this study. The decision to take part is purely voluntary. The researcher stated that if they chose not to take part or stop at any time, it would not affect their future medical care at the Veterans Administration facilities. A brief description of the research project was explained to each participant. This researcher explained briefly that each participant's responses on the questionnaire would be calculated and compared to their HbA1c results. Further statistical calculations would help to prove or disprove a hypothesis. If they agreed and gave their signed consent to participate in the study and met the inclusion criteria, this researcher would then hand out the questionnaire, and ask the participants to read the instructions and ask him/her if there had any questions before responding to the questionnaire. Those participants volunteering to participate were shown to a quiet place in the clinical waiting area or the participant's/patient's assigned exam room to complete the questionnaire. Once the participant had completed the questionnaire, he was asked to slip it in the locked box provided by the researcher.

CHAPTER 4

ANALYSIS OF DATA

Introduction

This chapter discusses the findings of the data analysis. A non-experimental, ex post facto design was used for this exploratory study. The independent variable in this study was male, Type 2 Diabetics who are outpatients at the Veteran Administration Hospital. The dependent variables were the subject's scores of self-efficacy and their A1c levels. The purpose of this study, as stated in the hypothesis, was to determine whether or not there is a correlation between self-efficacy scores on the IMDSES and blood sugar levels on the glycosylated hemoglobin test.

Description of Sample

The characteristics of the sample included Type 2, Diabetic male Veterans at the VA hospital's diabetic outpatient clinic and a diabetic satellite clinic located in the southwestern part of the US. Some of these outpatients were taking insulin in combination with oral hypoglycemic agents, and others were on insulin alone. Race included Caucasian, Black and Hispanic males. There were no participants less than 18 years of age or over 63 years of age and none were of Asian or other races.

Although the proposed number of participants anticipated was to be 35 in the proposal, due to numerous clinic appointment cancellations and clinic appointment no-shows, a total of 31 participants were enrolled for this study. The participants completed the demographic portion as well as the 28 items on

the questionnaire. The demographic portion of the questionnaire consisted of three items: 1), years diagnosed with diabetes; 2), age range; and 3), a recent result of the glycosylated hemoglobin, within three months, was filled out by the researcher.

Findings and Analysis

Two tools were used for data collection. These were 1), a demographic sheet to determine eligibility to be included in the study, and 2), the IMDSES, which is a questionnaire to test scores of self-efficacy.

The first tool, the demographic tool, consisted of three items. The items were years diagnosed with diabetes, age range block selection (18-40, 41-63, 64 +), and a recent (within 3 months) glycosylated hemoglobin result. It was found that the groups average in years diagnosed with diabetes was 6.63 and that thirty participants out of thirty one checked off the age range selection of 41-63. The group mean for the A1c score was 8.3.

The analysis of this data indicated that the diabetics in this group had been diagnosed with diabetes for an average of 6.63 years. The most frequent age range selection of the participants in this group was forty-one to sixty-three years of age. The group mean score for A1c levels (8.3%) were high (greater than 7%). The norm for A1c level is 4.0% to 6.0% and the diabetic goal is less than 7% as previously discussed in Chapter 2. Figure 7 gives a visual picture of the demographic data.

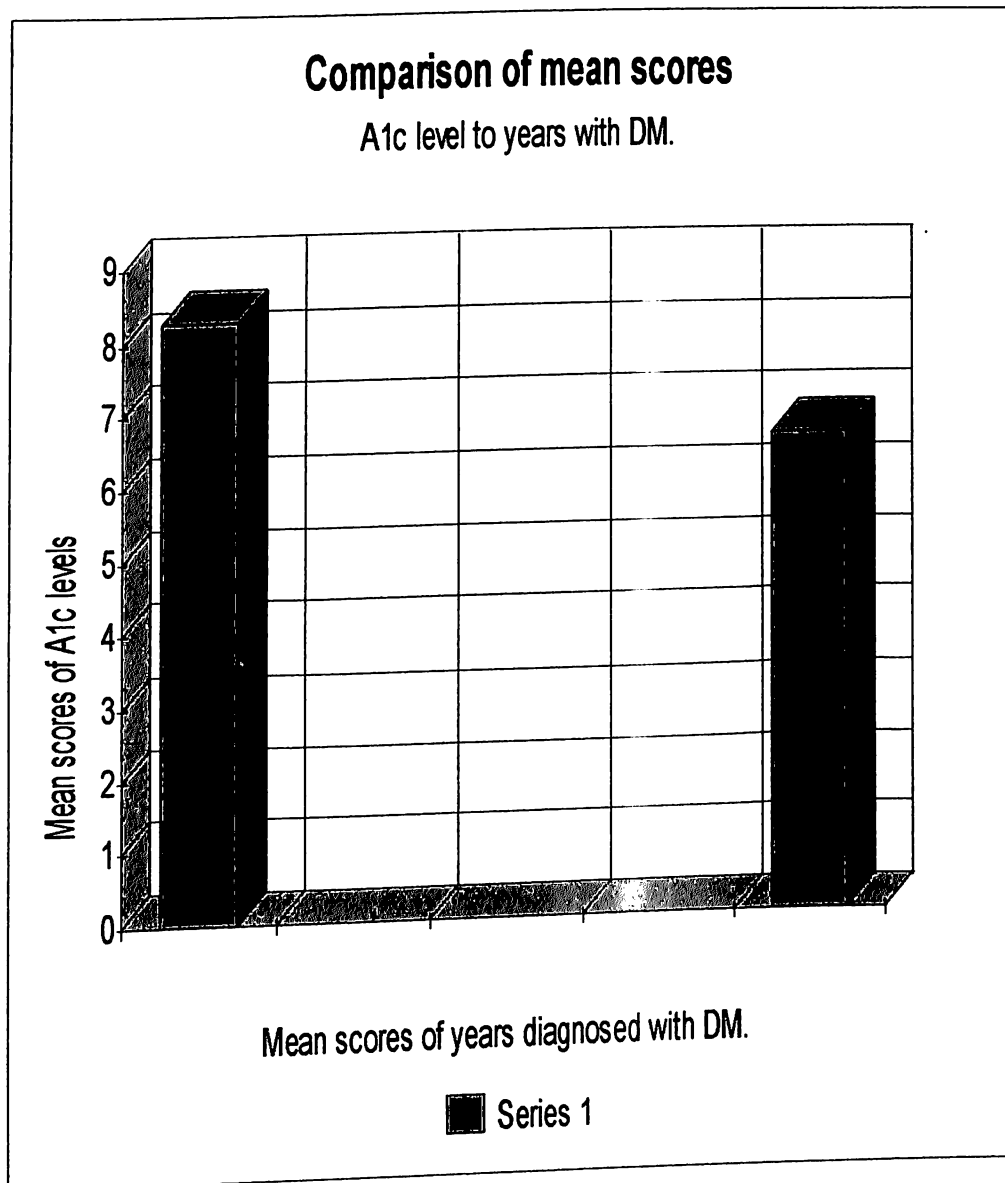


Figure 7. The mean scores of A1c (8.3) compared to the mean (or average) of years diagnosed with diabetes (6.63 yr.).

There was no correlation between years diagnosed, and the A1c mean in this study. The group mean A1c levels of 8.3% is considered high, or greater than 7%. The group mean of years diagnosed (6.63 average years experience) with diabetes did not predict lower A1c levels in this research study.

The second tool, the questionnaire, was used to test scores of self-efficacy. It was found that the group mean for test scores for self-efficacy was 75.7 which was above the cut off point of 70 as a passing rate. When analyzing this data, there is the indication that this group had an acceptable score or level of self-efficacy. Figure 8 gives a visual view of the group test scores and A1c levels.

Figure 8 is a bar and scatter-gram of the test scores and A1c results. The thirty-one vertical red bars, in figure 8, represent each individual's test scores against a scale of 0 to 100. The groups test score range was from 63 to 95. The blue horizontal scatter-gram exhibits a blue dot on each individual red bar indicating each individual's A1c score. The group's thirty-one individual A1c ranges were from 5.4 to 12.4%. There appeared to be no correlation between scores of self-efficacy and A1c levels.

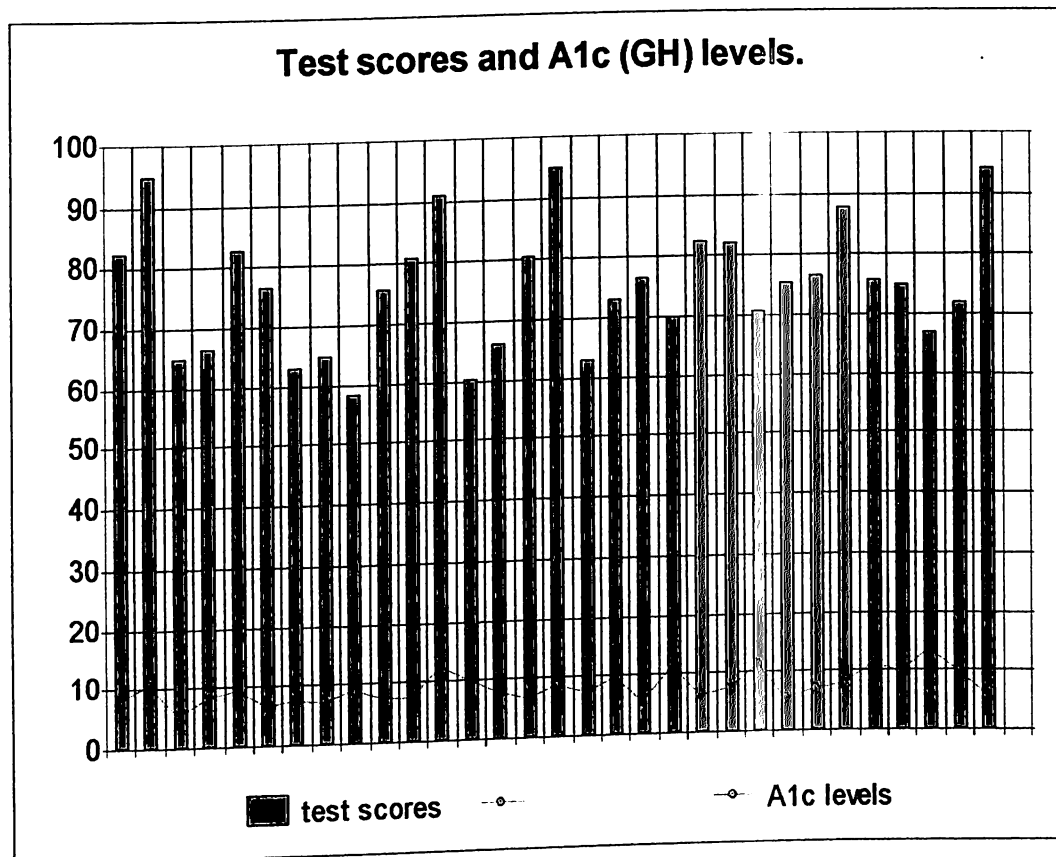


Figure 8. A bar and scatter-gram of the individuals in the group, their test scores and A1c results. There were nine who failed the test and twenty-two who passed. The maximum test score on the self-efficacy questionnaire that can be achieved is a 98. A breakdown of the scores reveal that scores in the 90's are considered high, scores in the 80's are medium high, and low passing scores are in the 70's, with a cut off point at 70. Test scores below 70 are considered below passing.

Figure 9 is a 3-D bar of the group's A1c mean and the mean scores of self-efficacy. This figure consists of two 3-D bars against a 0 to 80 scale, which shows the group's mean score for self-efficacy and the A1c mean scores. The bar to the left demonstrates the group's test score mean of 75.7, and the bar to the right demonstrates the mean A1c score of 8.3. There appeared to be no correlation between passing scores (70 and above) of self-efficacy and results of A1c levels.

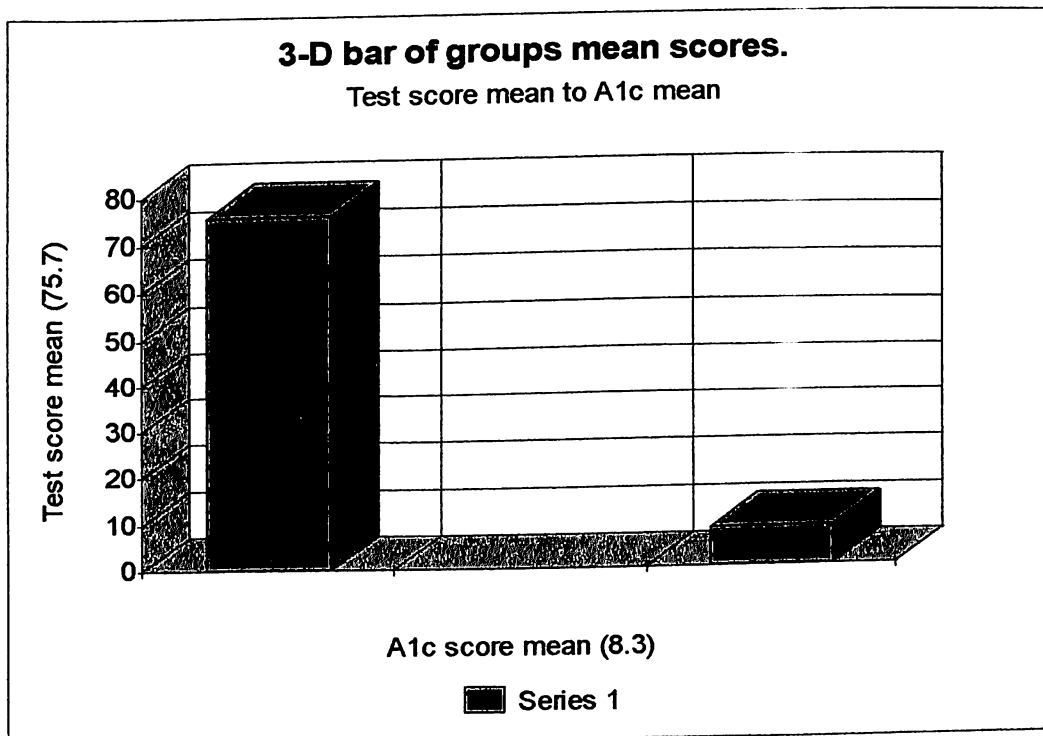


Figure 9. A 3-D bar depicts the group's mean A1c scores and test score mean.

Overall, the data outcome showed no apparent correlation between scores of self-efficacy, levels of A1c results, and years diagnosed with diabetes. The group's mean diagnoses of diabetes indicates that patient awareness and living with diabetes for 6.63 years or more had no effect on their levels of A1c results. High scores of self-efficacy did not exhibit low A1c levels or demonstrate a correlation between years diagnosed with diabetes. The results of the data analysis disproved the hypothesis: Male Veterans Affairs outpatients who are diagnosed as Type 2 diabetic patients and have blood sugar levels of less than 7% on the glycosylated hemoglobin test did not exhibit higher scores on the IMDSES than Veterans Affairs diabetic patients who do not have blood sugar levels of less than 7% on the glycosylated hemoglobin test. Therefore the hypothesis was rejected.

Summary of Analysis

The hypothesis proposed that low levels of A1c indicated higher scores of self-efficacy. The hypothesis was tested using the Pearson Correlation coefficient, utilizing the data collected from scores of self-efficacy and levels of A1c. The calculated results from the Pearson R were $-.0212$. The P value correlation was -0.0021205 . The Pearson correlation coefficient was negative and exhibited no significant difference from zero in this study. Therefore, the outcome of no significant difference between scores of self-efficacy and levels of A1c was evident and the hypothesis was rejected.

CHAPTER 5

SUMMARY OF THE STUDY

This study was conducted to determine if there is a correlation between scores of self-efficacy and levels of A1c results in male Type 2 Diabetics who are out-patients at the Veteran Administration Hospital. This chapter summarizes the previous chapters, discusses the findings, and delineates conclusions from this study. Recommendations for further study conclude this summary.

Summary

This non-experimental exploratory ex post facto study was based on the theory of self-efficacy, which is a concept in the Social Cognitive Theory, by Bandura (1997). According to the Social Cognitive Theory, self-efficacy is the capacity to organize and accomplish a certain level of performance, which is the theoretical basis for its use in diabetes. There are some authors who appear to view self-efficacy as a present unchangeable behavior in individuals (e.g., Deci & Ryan, 1985). Bandura (1997) contends that if self-efficacy were enhanced in a non-adherent individual, self-care would be beneficially improved. He also contends that certain components of self-efficacy can be manipulated to enhance self-efficacy.

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Studies on the concept of self-efficacy, although limited, have documented that patients with high scores of self-efficacy do better in managing their diabetes. They in turn appear to have fewer diabetes complications (Hurley, 1990). Previous research cites self-efficacy as the key to patients being able to manage their diabetes (Hurley, 1990; Hurley & Shea, 1992; Polly, 1992). However research studies by Pender (1998) cited inconsistencies in perceived self-efficacy and that data failed to explain specific health behaviors.

Hurley (1990) used the Insulin Management Self-Efficacy Scale (IMDSES) to measure scores of self-efficacy in Type 1 diabetic patients taking insulin. Permission was obtained to use the IMDSES as the instrument for this study. The reliability of the scale of self-efficacy was a Cronbach alpha of .82. The internal consistency of the scale was a theta coefficient of .87. The validity of this instrument was confirmed in Hurley's study through comparison of its scores with the A1c scores. The Pearson coefficient was a negative .1738. The reported results were that a higher score on the IMDSES predicted lower scores on the A1c. The study consisted of 117 subjects.

For this research study, the first tool was the demographics and it consisted of three items. This tool was used to collect years patient was diagnosed with diabetes, age range, and A1c scores (within 3 months). The sample consisted of 31 male Veterans Affairs out-patient Type 2 Diabetics at the VA hospital's diabetic outpatient clinic and a diabetic satellite clinic located in the southwestern part of the US. The sample was one of convenience, and

male whose ages ranged primarily from 40 to 61. Only Caucasians, Hispanics and Blacks participated in this study. There were no Asians or other ethnic groups that participated in this study.

The second tool used for this study was the IMDSES. It was used to measure scores of self-efficacy in Type 2 Diabetics taking insulin. The questionnaire consisted of 28-items related to daily diabetic general care, diet, foot care and insulin. The responses utilized a Likert rating scale ranging from 1— Strongly agree to 6—Strongly disagree & included a 7—Non-applicable. The scoring and grading were previously discussed in chapter 3 & 4.

The data was collected over a period of two and a half months. A convenience sampling method was used. When the participants came for their clinical appointments, the researcher or assistant reviewed the appointment sheet and met each person eligible to participate in this diabetic research study. The researcher interviewed each participant and stated that she was asking them to participate in a diabetic research study. She stated that their most recent A1c results would be obtained from their medical records and stated that everything that is learned was confidential. It was further explained that there would be no monetary gain, compensation, nor would there be any services be withheld if they did not participate. Participation was voluntary. A brief description of the research study was explained to each patient. When they agreed to be a participant, they signed a permit of informed consent. A copy was given to the patient. The questionnaire was completed by the patient in a

quiet room and collected by the researcher and placed in a ballot type container for the purpose of confidentiality.

The questionnaires were scored, and mean scores for self-efficacy and A1c results were calculated. The mean scores of self-efficacy were calculated to be 75.7 and the mean for A1c was 8.3. The data was analyzed using the Pearson R coefficient. The statistical calculation found was a Pearson's $R = -.0212$ with a P value of -0.0021205 . The Pearson correlation coefficient was negative and exhibited no significant difference from zero. The outcome of no significant difference between scores of self-efficacy and levels of A1c was evident and the hypothesis was rejected.

The findings of the study were not consistent with the theoretical framework on which this study was based to test levels of self-efficacy. Data analysis demonstrated that there was no significant difference ($P = -0.0021205$) between scores of self-efficacy and A1c levels.

Discussion of the Findings

The findings of this study did not confirm a correlation between scores of self-efficacy and A1c results. This was proven by the Pearson's coefficient of negative 0.0212. The groups mean test score was a 75.7 (passing score 70 to 98) compared to the mean A1c score of 8.5 (norm less than 7%). A passing or higher scores of self-efficacy were not a prediction of low levels of A1c scores in this study as in previous research studies on self-efficacy have documented.

There were two data collection tools utilized in this study. The first tool was used to collect demographic data that consisted of three items, one of which was the levels of A1c, which measures the blood sugar over a period of 120 days or three months. This measure is considered a very good indicator of level of blood sugar control (Peragallo-Dittko, 1998). The second instrument, the IMDSES, was used to measure scores of self-efficacy and included 28 questions, on general diabetic living, diet, insulin and exercise. The highest possible score for this instrument is a 98. These tools were used in this research to study scores of self-efficacy on levels of A1c and see if there were any predictive outcomes exhibited.

Bandura, the father of the Social Cognitive Theory from which the self-efficacy concept is derived, cites self-efficacy as a positive force in diabetic care in controlling blood sugar levels. Bandura (1997) states that it is documented in the literature that an individual's past experiences in dealing with a particular situation help to form one of the components of self-efficacy, the Enactive Attainment, which is the strongest component of self-efficacy. Bandura infers that this information source helps to develop confidence and mastery of skills through past experiences.

Previous research by Hurley (1991) utilizing the same (IMDSES) instrument have claimed high scores of self-efficacy as a positive factor in A1c levels. Her research cites scores of self-efficacy as a predictive indicator of A1c

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Previous research by Hurley (1991) utilizing the same (IMDSES) instrument have claimed high scores of self-efficacy as a positive factor in A1c levels. Her research cites scores of self-efficacy as a predictive indicator of A1c

scores. Hurley's study was conducted in a large diabetes center located in an East Coast city. Hurley's sample consisted of 142 adults ranging in age from 18 to 75, duration of diagnosis with diabetes ranged from less than 1 year to 45 years. Her subjects consisted of male and female patients, more female than male patients participated. The socio-economic class, although 12 did not finish high school, was middle income to upper class (Hurley, 1990).

However this study did not find that high scores on self-efficacy, or years of experience with diabetes have a positive effect (less than 7%) on levels of A1c. This difference may be related to the lower number of subjects (31), the fact that this sample's gender was all male, and the study was conducted in a Veterans Hospital consisting of middle to lower, socio-economic patients. There were no apparent correlation patterns or predictive outcomes.

Conclusions

The following conclusions were derived:

1. This research study found no correlation pattern or predictive outcome of scores of self-efficacy on A1c levels in this research study.
2. Years diagnosed with diabetes or experience demonstrated no predictive outcome on A1c levels.
3. Years diagnosed with diabetes exhibited no predictive outcome on scores of self-efficacy.

Implications for Nursing Theory, Practice and Research

They are as follows:

1. Self-efficacy should be carefully evaluated since it may not hold true for each patient.
2. Self-efficacy is a concept that can be used but perhaps further research is needed.
3. Self-efficacy can be an evaluation tool for nurse educators.
4. The findings of this study could point to further research to determine either “for or against” or geographic location.
5. Could ethnicity, length of time of diagnosis or other factors have had an impact on the responses?

Recommendations for Further Study

Based on the results of the study the following recommendations are suggested for further research.

1. Replication of this study with a larger sample size to determine if the results can be duplicated or display an outcome supporting the self-efficacy concept.

2. Replication of the study to be conducted in another health center environment including other ethnic groups.
3. Replication of the study to include the female gender as well as males.
4. Replication of the study to determine if male and female diabetic patients might score differently.

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APPENDIX A
CONSENT FORM LETTER
DEMOGRAPHIC DATA SHEET
AND
INSULIN MANAGEMENT DIABETES
SELF-EFFICACY SCALE

Subject Name: _____ Date _____

Title of Study: Self-efficacy in type 2 diabetics.

Principal Investigator: Joan M Hyett RN VAMC: San Antonio, TX

DESCRIPTION OF RESEARCH BY INVESTIGATOR

Description of Research by Investigator

We are asking you to take part in a research study of self-efficacy in type 2 diabetics. Self-efficacy is defined, in this study, as the diabetic individual's belief in their ability or capacity to organize, problem-solve and carry out specific self-care survival skills to meet the daily demands of diabetic living. We want to learn if self-efficacy is related to better management of diabetes. We are asking you to participate in this study because you are a diabetic patient in the VA system.

If you decide to take part, you will be asked to fill out a 28-item questionnaire about self-efficacy. This will take approximately fifteen minutes of your time. We will obtain the results of your most recent HbA1c test from your medical records. This test (HbA1c) plots your blood sugars over the last three months. The responses from your completed questionnaires will be compared to your HbA1c test. All data obtained from each participant will be grouped together and further statistical calculations will prove or disprove the hypothesis that self-efficacy is related to better management of diabetes.

There are no foreseeable risks or discomfort that might result from participation in this study. There will be no placebos or experimental drugs given. There will be no invasive procedures or drawing of blood. There will be no withholding of medical services. Medical services will be readily available if a problem occurs while filling out the questionnaire.

We do not guarantee that you will benefit from taking part in this a study. We can not pay you for participation in this study.

SUBJECT'S IDENTIFICATION (I.D. plate or give name-last, first, middle)



Signature of Subject

Thank you for your participation in this Diabetes Self-efficacy study. Your name will not appear on the survey. There are 28 multiple choice items. Please try to answer them all. THERE ARE NO RIGHT OR WRONG ANSWERS. This survey asks you to rate your degree of confidence for carrying out diabetes related to activities. When you have completed the questionnaire, place it in the locked ballot box at the nurses station.

THANK YOU.

Demographic Sheet

1. How long have you had diabetes: _____
2. Age: 18-40 _____
41-63 _____
64+ _____
3. Results of most recent glycosylated hemoglobin test _____
(To be filled out prior to the questionnaire being given to the patient).

INSULIN MANAGEMENT DIABETES

SELF-EFFICACY SCALE

USING THE LEGEND BELOW, PLEASE RESPOND TO THE FOLLOWING STATEMENTS BY CIRCLING THE NUMBER THAT MOST APPROPRIATELY REFLECTS YOUR FEELINGS.

- 1–Strongly agree
- 2–Moderately agree
- 3–Slightly agree
- 4–Slightly disagree
- 5–Moderately disagree
- 6–Strongly disagree
- N/A–Not applicable

- | | | |
|-----|--|-----------------|
| 1. | I can carry out practically all of the self-care activities in my daily diabetes routine. | 1 2 3 4 5 6 N/A |
| 2. | I am confident in my ability to manage my diabetes. | 1 2 3 4 5 6 N/A |
| 3. | I feel unsure about having to use what I know about diabetes self-treatment every day. | 1 2 3 4 5 6 N/A |
| 4. | I don't think I can follow my diabetes routines every single day. | 1 2 3 4 5 6 N/A |
| 5. | I can eat my meals at the same time every day. | 1 2 3 4 5 6 N/A |
| 6. | I can stay on my diabetic diet when I eat in familiar places away from home (such as at a friend's house). | 1 2 3 4 5 6 N/A |
| 7. | I can stay on my diabetic diet when I eat in unfamiliar places. | 1 2 3 4 5 6 N/A |
| 8. | I'm not sure I'll be able to stay on my diabetic diet when the people around me don't know that I have diabetes. | 1 2 3 4 5 6 N/A |
| 9. | I'm not sure I'll be able to follow my diabetic diet every day. | 1 2 3 4 5 6 N/A |
| 10. | I can correctly exchange one food for another in the same food group. | 1 2 3 4 5 6 N/A |
| 11. | When I go to parties, I can follow my diet plan. | 1 2 3 4 5 6 N/A |
| 12. | I can exercise several times a week. | 1 2 3 4 5 6 N/A |
| 13. | I can't exercise unless I feel like exercising. | 1 2 3 4 5 6 N/A |
| 14. | I can figure out when to call my doctor about problems with | |

- | | | |
|-----|--|-----------------|
| | my feet. | 1 2 3 4 5 6 N/A |
| 15. | I can routinely apply the recommended lotion to my feet. | 1 2 3 4 5 6 N/A |
| 16. | I cannot test my blood or urine when I am away from home. | 1 2 3 4 5 6 N/A |
| 17. | I can recognize when my blood sugar is too high. | 1 2 3 4 5 6 N/A |
| 18. | When I feel sick, I can test my blood or urine more than I routinely do. | 1 2 3 4 5 6 N/A |
| 19. | I can take my insulin using the recommended procedure. | 1 2 3 4 5 6 N/A |
| 20. | I may have difficulty taking my insulin when away from home. | 1 2 3 4 5 6 N/A |
| 21. | I can adjust my insulin dose based on the results of my urine or blood tests. | 1 2 3 4 5 6 N/A |
| 22. | I'm not sure I can figure out what to do about my insulin dose when changes occur in my usual routine. | 1 2 3 4 5 6 N/A |
| 23. | I can do what was recommended to prevent low blood sugar reactions when I exercise. | 1 2 3 4 5 6 N/A |
| 24. | I can figure out what self-treatment to administer when my blood sugar gets higher than it should be. | 1 2 3 4 5 6 N/A |
| 25. | I'm not sure I can recognize when my blood sugar is low. | 1 2 3 4 5 6 N/A |
| 26. | I'm not sure I can adjust my diabetes self-treatments if I get a cold or the flu. | 1 2 3 4 5 6 N/A |
| 27. | I can fit my diabetes self-treatment routine into my usual lifestyle. | 1 2 3 4 5 6 N/A |
| 28. | I think I'll be able to follow my diabetes plan even when my daily routine changes. | 1 2 3 4 5 6 N/A |

DO YOU HAVE ANY COMMENTS YOU WISH TO ADD ABOUT CONFIDENCE IN YOUR ABILITY TO SELF-MANAGE YOUR DIABETES?

THANK YOU

APPENDIX B
PERMISSION TO USE INSULIN MANAGEMENT
SELF-EFFICACY SCALE

From: Joan M Hyett <J.M.Hyett@worldnet.att.net>
To: Dr. Ann Clare Hurley
Cc: Joan M Hyett <J.M.Hyett@worldnet.att.net>

Subject: Self-efficacy scale (IMDSES)

Date: Monday, April 10, 2000 7:53 PM

Hi, I am an RN in the masters program at University of the Incarnate Word, in San Antonio, Texas. I am working on my thesis proposal and would like permission to use your IMDSES to measure self-efficacy in diabetics taking insulin. I plan to do a correlation between the scores of self-efficacy and the HbA1c results.

Please let me know. I would like written permission to use it for my research. I am documenting in my paper that you developed the scale. It is a modified version of Crabtree's (1986) Diabetic Self-efficacy Scale. You can e-mail me permission or send via mail address. Also, do you know how I can get in contact with Dr A. Bandura and Dr Dorothy Orem. I could not find them on the internet. I am in San Antonio, Texas. If you need further information, I will send it. Thanks so much. Please respond.

Sincerely: Joan Marie Hyett

Joan Marie Hyett RNC BSN
7474 Weybridge
San Antonio, Texas 78250-3360
Phone 210-680-2836
E-mail Address: J.M.Hyett@worldnet.att.net

*Hope you received the packet.
Sincerely,
Ann Hurley*