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APPROVAL BY COMMITTEE CHAIR

This project has been approved on the date shown below:

______________________________  _______________________
Deborah Vincent, PhD, FAANP    Date:
Clinical Associate Professor of Nursing
DEDICATION

With all my thanks to the many people who believed that I could complete an advanced degree and supported me throughout the process. My family has been my staunch supporters, my daughter Lori who graduated from law school one year ago, a tireless cheerleader; my husband Al allowed me to pursue my dream despite putting his own retirement plans on hold. I dedicate this project to my mother Janice Hampton, who although her own college education was interrupted by the war, she passed on a love of learning to all four of her daughters.
# TABLE OF CONTENTS

LIST OF ILLUSTRATIONS ......................................................................................................................... 6

ABSTRACT ....................................................................................................................................................... 7

CHAPTER ONE .................................................................................................................................................. 8

Introduction .................................................................................................................................................. 8
Problem Statement ........................................................................................................................................ 8
Purpose of Project ......................................................................................................................................... 8
Background and Significance ..................................................................................................................... 9
Health Literacy ........................................................................................................................................... 10
Culture and Diabetes ............................................................................................................................... 11
Diabetes Self-Management Education ................................................................................................... 12
Patient Empowerment ........................................................................................................................... 13
Self-Efficacy ............................................................................................................................................... 14
Health Care Disparities in Mexico ........................................................................................................... 14
Definitions .................................................................................................................................................. 17

- Diabetes Self-Management Education (DSME) .................................................................................. 17
- Self-Efficacy ........................................................................................................................................... 18
- Health Literacy ....................................................................................................................................... 18
- Empowerment ......................................................................................................................................... 18
Summary ...................................................................................................................................................... 18

CHAPTER TWO ........................................................................................................................................... 20

Review of Literature .................................................................................................................................. 20
Prevalence and Complications ............................................................................................................... 20
Pathophysiology of Diabetes ................................................................................................................... 22
Diabetes Self-Management Education ................................................................................................... 23
Self-Efficacy and Diabetes Self-Management ......................................................................................... 25
Cultural Tailoring of DSME ..................................................................................................................... 27
Health Literacy and Diabetes Self-Management ..................................................................................... 34
Theory ......................................................................................................................................................... 35

- Application of Theory to DSME Proposal ......................................................................................... 37
Summary ...................................................................................................................................................... 39

CHAPTER THREE ....................................................................................................................................... 40

Introduction .................................................................................................................................................. 40
Cultural Tailoring of Diabetes Self-Management Strategies .................................................................. 42
Testing Intervention Based on Health Promotion Model ......................................................................... 44
TABLE OF CONTENTS - Continued

Provision of Low Literacy Oriented DSME ................................................................. 46
Educational Program ................................................................................................. 47
Description of the Sample and Setting ................................................................... 47
Description of the Modules ...................................................................................... 49
  Module 1 .................................................................................................................... 50
  Module 2 .................................................................................................................... 52
  Module 3 .................................................................................................................... 55
  Module 4 .................................................................................................................... 57
  Module 5 .................................................................................................................... 58
  Module 6 .................................................................................................................... 60
Implementation .......................................................................................................... 62
Summary ..................................................................................................................... 63

CHAPTER FOUR ......................................................................................................... 65
Introduction ............................................................................................................... 65
Evaluation of Results ............................................................................................... 66
Psychological Measures ......................................................................................... 66
Biological Measures ............................................................................................... 69
Satisfaction of Key Players ...................................................................................... 70
Summary .................................................................................................................... 71

CHAPTER FIVE ........................................................................................................... 72
Introduction ............................................................................................................... 72
Strengths of the Project ........................................................................................... 73
Limitations of the Project ........................................................................................ 74
Sustainability ............................................................................................................ 75
Implications for Nursing Practice and Future Research .......................................... 75
Summary .................................................................................................................... 76

APPENDIX A: PATIENT EDUCATION MODULES ..................................................... 78

APPENDIX B: PATIENT HANDOUTS ........................................................................ 94

APPENDIX C: PATIENT SATISFACTION FORM ....................................................... 109

REFERENCES .......................................................................................................... 111
LIST OF ILLUSTRATIONS

FIGURE 1. The Health Promotion Model ........................................................................36
ABSTRACT

Diabetes is growing at an epidemic rate worldwide but Latinos of Mexican origin are at especially high risk. These high-risk minority populations require extra efforts on the part of providers to decrease the rate of diabetes and related complications. The purpose of this project is to develop a diabetes self-management education program for use with a low-literate population in rural Mexico. Many of the strategies that have proven useful with populations of Mexican American immigrants will be adapted for use in this project. Six interactive, culturally sensitive, educational modules are planned and include strategies that have proven useful in prior studies with Hispanic populations. Methods and materials that meet the criteria for those with low literacy; such as presentation of a single message, use of visual aids, verification that the message is understood, review of main points each class, and use of an interactive style of presentation will be incorporated. Empowerment approaches will be utilized to ensure that the program meets the needs identified by the participants. Both biologic and behavioral measures will be used to evaluate the effectiveness of the educational intervention.
CHAPTER ONE

Introduction

Chapter one introduces the significance of diabetes both worldwide, in the United States, and focuses on the problem within Mexico. The role of literacy and health literacy is explored as it relates to the ability that a person with diabetes has to self-manage their disease. The chapter presents the relationship between culture and diabetes and how this relationship impacts the need for culturally tailored diabetes self-management education. Diabetes self-management is a key component in achieving glycemic control and preventing complications related to chronic hyperglycemia. The increase of self-efficacy as the goal of education and the use of empowerment strategies will be further explored in this chapter.

Problem Statement

While there is an enormous world-wide burden from diabetes, some groups are more at risk than others. Latino people, especially those of Mexican origin are twice as likely to have diabetes as are non-Latino white people of similar ages (CDC, 2005). As in many other countries, the incidence of diabetes in Mexico is rising and diabetes is now the third leading cause of death (Jimenez-Cruz, 2004).

Purpose of Project

The purpose of this project is to develop a diabetes self-management education program for use with a low-literate population in rural Mexico. Many of the strategies that have proven useful with populations of Mexican American immigrants will be adapted for use in this project.
The intent of this project is to utilize methods and assemble materials that meet the criteria for those with low literacy; such as presentation of a single message, use of visual aids, verification that the message is understood, review of main points each class, and use of an interactive style of presentation (Rosal, 2004). In addition, strategies will be reviewed in light of the Mexican way of life, to assist in cultural sensitivity. Classes will include discussions with participants regarding what they wish to learn and achieve, to assure that they are partners in the health care interaction. Empowerment approaches will be used to encourage patients to actively participate in the management of diabetes.

Background and Significance

Type 2 diabetes is increasing at epidemic rates worldwide, and specific ethnic groups are affected more than others. The risk for Hispanics in the United States to develop type 2 diabetes is twice that of non-Hispanics (CDC, 2005). In an attempt to reduce health care disparities within the United States (U.S.), the Department of Health and Human Services mandates priorities related to design and evaluation of culturally competent interventions (US DHHS, 2001). These interventions must address the complexity of the information required to successfully manage diabetes and identify individual components that individuals with diabetes must master (Seley, 2007).

These components address the acquisition of new skills such as self-glucose monitoring as well as the cognitive processes required to understand how blood sugar impacts health. The ability to internalize this new information often predicts the person’s success in their diabetes self-management (Garcia, 2007).
Health Literacy

Health literacy is an important concept related to diabetes self-management. According to a report by the Institute of Medicine (IOM, 2004), health literacy allows a person to obtain, process, and understand basic health information and services needed to make appropriate health-care decisions. This is important because it affects every interaction the patient has with the health care system. Studies have shown that people with low health literacy have less preventive care and use more expensive health services such as emergency department care (IOM, 2004).

The Healthy People 2010 initiative recognizes health literacy as an important component of communication. Improvement of health literacy is one of the goals being tracked in the health initiative (US DHHS, 2001). Health literacy includes the ability to understand instructions about how to check blood sugar, understand the meaning of blood glucose readings, and decision-making skills related to actions needed, based on the results. The ability to analyze relative risks and benefits of behaviors, calculate medication doses, interpret test results or locate health information may be required in the self-management of diabetes (Zorn, 2004).

Illiteracy rates are as high as 40% in rural Mexico (Valenzuela, 2003). A study completed in the rural town of Morelos, Mexico examined the knowledge and beliefs regarding T2DM of 521 participants. Of the participants, 3 had secondary schooling, one-third of the respondents had never attended school, and the highest educational level for the remainder was primary school (Valenzuela, 2003). Illiteracy or poor reading skills has a profound effect upon one’s ability to understand and act upon health information (IOM,
The low level of literacy within this rural population requires that diabetes educational materials be presented in a simplified format, using a minimum of language and many audio-visual aids and demonstrations. Using the “teach-back” method in which the client restates the information is another useful technique in those with low-literacy and low health literacy (Seley, 2007).

Culture and Diabetes

Literacy is only one factor that impacts diabetes self-management education; diabetes has been identified as a biopsychosocial illness, reflecting the social and cultural influences on the person’s ability to successfully self-manage the disease (Anderson & Funnell, 2000). Many Mexicans have strong religious beliefs and perceive life as being under the constant control of divine will. This fatalistic view leads to the belief that one is at the mercy of the environment and has little control over what happens; thus one may not take responsibility for present or future failures or successes (Lujan, 2007).

Another cultural characteristic of Mexicans relates to time orientation. Mexicans are characterized as having a present orientation to time, which may lead to less concern regarding future events (Giger, 2004). In this population, an emphasis on good control of blood sugars to prevent future complications may have limited value. Instead, helping the patient understand that better blood sugar control will make him/her feel better today may be a more valid approach.

In the Mexican culture, the family is a valued institution as well as the main focus of social identification (Giger, 2004, Lujan, 2007, Whittemore, 2007). Frequently extended families of three or more generations live together. These extended family
relationships have a major significance within the culture (Wen, 2004). Focus groups have identified the importance of the family within the Mexican culture and the need for family support for successful diabetes self-management (Vincent, et al., 2006). The concept of “familism” or valuing of family considerations over individual or community needs is a strong, almost universal value in the Hispanic community (Kemp, 2005). While this cultural value may mean elders with diabetes receive better care from their family, middle-age women may suffer due to putting the needs of the family ahead of their own needs (Wen, 2004). In addition to family support, or the lack thereof, the actual community where a patient lives may either promote or be a barrier to successful diabetes self-management (Seley, 2007). The community influence is through cultural values and beliefs, access to health care and socioeconomic constraints.

Providing materials in the patient’s native language is another socio-cultural approach useful in meeting the needs of this population (Whittemore, 2007). Offering meal plans or dietary advice within the confines of the culture is an important recognition of the distinctiveness of Mexican culture (Brown, 1999).

Diabetes Self-Management Education

An overall goal in Healthy People 2010 is to increase the number of persons with diabetes who receive formal diabetes education (US DHHS, 2001). Advances in technology have increased the complexity of skills needed by both the patient and the provider of care in the field of diabetes. A recent symposium investigated best practices for diabetes self-management (Seley, 2007). One theme that emerged from this investigation centered on the view of diabetes as a chronic condition, with a model of
care that is proactive rather than reactive, and prevents complications and maintains the patient’s quality of life. Goals of diabetes education include motivating the person with diabetes to improve self-care and glycemic control, as well as empowering the person to sustain these improvements for the long term (Seley, 2007). Diabetes self-management education should cover all areas of diabetes management, with a focus on the needs identified by the individual patient (Seley, 2007). A curriculum may include: description of the diabetes disease process and treatment options, guidelines for nutritional management, incorporation of physical activity into daily life, the use of medication, how to monitor blood glucose and use results to improve control, the prevention, recognition, and treatment of acute complications, strategies to reduce the risk of complications, the use of goal setting and problem solving to improve daily life, and consideration of the psychosocial aspects of life with diabetes (Mensing, 2007).

Patient Empowerment

The patient empowerment paradigm, based on patient collaboration and relationship building between patient and the professional is the result of clinical research completed at the Michigan Diabetes Research and Training Center. This program defines empowerment as: “Helping people discover and use their innate ability to gain mastery over their diabetes” (Anderson, 2000). This vision of care requires the educator’s recognition that diabetes is truly a self-managed illness and that daily choices made by persons with diabetes have a far greater impact on their health than any care provided by the helping professional.
The educator provides the resources to ensure that the patient can make informed decisions, has the skills needed for self-care, adequate support, and help with problem-solving. The use of the empowerment approach is linked to increased self-efficacy and allows the patient to build confidence in his/her ability to identify and achieve personal goals, handle problems, cope with emotional issues, manage stress, gain social support, and may provide the motivation required to achieve and maintain behavior changes (Krichbaum, 2003).

Self-Efficacy

This concept, introduced by Bandura as part of the Social Cognitive Theory (1997) states that an individual’s belief of his or her ability to perform a specific task is a basis for successful completion of the task. One goal of diabetic education is to involve patients with diabetes in their own care, by first doing a self-assessment to identify learning needs. Education can be directed at these self-identified deficiencies in knowledge and skills, thus improving self-efficacy. Bandura postulates that a person’s perceived self-efficacy is the link between knowing what to do and actually doing it.

Numerous studies show links to better diabetes control when self-efficacy is addressed in the intervention (Krichbaum, 2003). Addressing the beliefs and emotional barriers to self-management during counseling sessions helps the person with diabetes obtain a higher level of self-efficacy (Krichbaum, 2003).

Health Care Disparities in Mexico

In Mexico, diabetes is the leading cause of adult non-obstetric hospital admissions and hospital mortality, and the third cause of mortality nationwide (Jimenez-Cruz, 2004).
There is increased demand for health care services to treat and manage the complications of diabetes.

This increased demand for services raises questions about the ability of the people to obtain treatment for diabetes. The government health plans do not consistently pay for monitoring supplies and syringes. Medications to treat diabetes, hypertension, and cholesterol cost between $180- $200/month in the border city of Tijuana, Mexico. For the sixty-five percent of Mexicans in Tijuana who have an average family income of $250/month or less, the cost of medications and supplies are more than they can afford (Jimenez-Cruz, 2004). While the Mexican health system struggles to provide equitable and accessible health care, the reality is that those who earn the least pay the most for health care (Arredondo & Najera, 2005). A recent study confirms the disparities that exist in the provision of care for diabetes in Mexico (Arredondo & Barcelo, 2007). These disparities may produce poorer clinical outcomes and a higher rate of complications among populations unable to access care. The 2000 Mexican National Health survey found that over 50% of the population had at least one chronic condition but did not have access to medications required to treat the condition (Jimenez-Cruz, 2004).

There is a large economic toll generated by the diabetes epidemic. In the United States in 2002, direct medical costs including costs associated with lost productivity were estimated at $132 billion dollars (Hogan, Dall, Nikolov & ADA, 2003). This is a conservative estimate that does not account for pain and suffering, care provided by unpaid caregivers, or optometry and dental care. Reports vary from Mexico regarding the economic burden of diabetes. One fact that is clear is the increasing cost of caring for
patients with diabetes. A study from 2004 completed in Mexico showed a 26% increase in the cost of providing care over two years, and anticipated that the costs will exceed the resources in the near future (Arredondo & Zuniga, 2004).

In the United States, people of Hispanic descent are twice as likely to have diabetes as non-Hispanic white persons (CDC, 2005). In an effort to address these health disparities, the Department of Health and Human Services set goals for reducing the rate of diabetes in high risk populations. Healthy People 2010, a health initiative that set national health objectives, included goals to improve all aspects of diabetes care. They are: An increase in early recognition and early treatment of diabetes, improvement of individual control of diabetes, reduction of complications, and provision for equal access to education for all persons with diabetes (US DHHS, 2001).

These goals of Healthy People 2010 relate to prevention, early identification of those with the disease, and reduction of complications. Achievement of goals requires that all those with diabetes receive the same high quality evidence based care. According to a fact sheet from the CDC, reducing high blood pressure among people with diabetes could prevent one-third of diabetes-related eye, kidney, and nerve disease. Good blood glucose control as well as early detection and treatment of microvascular changes in the eye could prevent 60% of blindness related to diabetes. About half of all extremity amputations can be prevented by properly caring for feet and reducing risk factors; such as high blood glucose levels, cigarette smoking, and high blood pressure (CDC, 2005).

In Mexico the rate of diabetes is expected to double between the years of 2000 and 2030, with recent surveys showing an increase in prevalence from 7.2% in 1993 to
10.7% in 2000 (Arredondo & Barceló, 2007). A suggestion from Mexico for decreasing the burden of diabetes is to allocate a greater investment of financial resources towards prevention of diabetes by promotion of educational programs directed at the general population as well as those with diabetes. According to the authors, these programs can be coordinated by the health care sector but will require support at every level of government including federal, state, and municipal levels (Arredondo & Zuniga, 2004).

Definitions

The following are definitions of terms that will be used throughout the proposal:

*Diabetes Self-Management Education (DSME)*

DSME encompasses learning the skills to manage diabetes as well as adjusting to the psychosocial aspects of a chronic condition. According to the American Diabetes Association, DSME is an interactive collaboration between the educator and the patient (Mensing, 2007). The process of education includes assessing the patient’s learning needs, helping identify self-management goals, and counseling to help the patient achieve goals. The educator is also responsible for evaluating the patient’s progress in reaching goals. Curriculum should address diabetes as a disease process, provide nutritional guidance, encourage physical activity, instruct on use of medications, develop skills to self-monitor blood glucose, address the prevention and treatment of complications, risk reduction and treatment of chronic complications, direct in goal setting, problem solving in daily life, and psychosocial adjustment to diabetes (Mensing, 2007). The learning needs of the patient guide the content addressed during interventions.
**Self-Efficacy**

This concept from Social Cognitive Theory is defined as the perceived ability by the patient to perform a skill successfully (Bandura, 1997). There is growing agreement that self-efficacy is a predictor for successful adoption of new behaviors (Lorig, 2003).

**Health Literacy**

Refers to the patient’s ability to read, comprehend, and act on medical instructions, is thought to contribute to the burden of diabetes in those of lower socio-economic status (Rosal, 2003).

**Empowerment**

This is a philosophy of diabetes education in which the patient chooses the topics and sets goals for his own care. By using a patient centered model for educational interactions, the patient is allowed to decide if the changes are truly needed and beneficial (Seley, 2007). This philosophy acknowledges that the person with diabetes is completely responsible for managing his/her illness, that choices, control, and consequence belong to the patient (Anderson & Funnell, 2000). The responsibility of the educator is to provide the resources needed to help the person with diabetes make informed decisions, learn the skills needed for self-care, provide support, and encourage reflection on choices, goals, and problem solving (Anderson & Funnell, 2000).

**Summary**

Chapter one provides an overview, background, and discussion of the significance of type 2 diabetes within the Mexican population. The rapid growth of diabetes both world-wide and specifically in persons of Mexican descent reflects an epidemic that must
be addressed. Diabetes education is the basis for teaching people the skills to live with their disease and reduce the rate of complications. In order to reduce health care disparities, all persons with diabetes must have access to diabetes self-management education. Educators acknowledge the multiple social, cultural, and psychological factors that impact the patient’s skills in self-management. These include health literacy, cultural beliefs, and psychological support systems, all of which impact the patient’s ability to adopt behavior changes needed for successful self-management. Chapter two will examine these factors more thoroughly in light of research findings.
CHAPTER TWO

Review of Literature

This chapter presents a review of the literature germane to self-management of type 2 diabetes mellitus (T2DM) in Mexican and Mexican American adults. The related literature includes: a discussion of the prevalence and complications of the disease, an overview of the pathophysiology of diabetes, principles of diabetes self-management education, necessary self-management behaviors, cultural tailoring of diabetes self-management education to enhance cultural sensitivity, and the role of self-efficacy.

Prevalence and Complications

Diabetes affects a staggering 246 million people worldwide (International Diabetes Federation, 2007). According to former International Diabetes Federation (IDF) President Pierre Lefebvre, “Just twenty years ago, the best information suggested that 30 million people had diabetes. A bleaker picture has now emerged; diabetes is fast becoming the epidemic of the 21st century.” In response to an appeal by the IDF, the United Nations called for the establishment of a World Diabetes Day, to be observed on November 14th beginning in the year 2007. The purpose of this day is to raise public awareness about diabetes, related complications, and the need for prevention and treatment.

Developing countries account for seven of the world’s top 10 countries affected by diabetes. India leads with a total of 40.9 million persons having diabetes, China closely follows with 39.8 million people, and Mexico is ninth with 6.5 million people.
The Institute of National Health in Mexico estimates by the year 2025 there will be close to 11.7 million Mexicans diagnosed with the diabetes (IDF, 2007, Martorell, 2005).

Obesity, recognized as a major risk factor for the development of diabetes, is on the rise in Mexico. The percent of overweight or obese women increased from 33% to 59% in just one decade (Martorell, 2005). This increase in obesity is seen in all regions of Mexico, and is no longer a problem confined to the rich. Poor Mexicans shoulder the burden of child under nutrition, evidenced by low height for age, in addition to obesity (Martorell, 2005).

Population movement from rural to urban areas, changes in diet, and decreased physical activity contribute to the 26% increase in diabetes in Mexico over the past 40 years (Rull, et al., 2004). This shift from rural lifestyles where a large amount of physical exertion was required to urban environments, and the use of cars and buses for transportation, brought about increases in obesity. Dietary changes such as increased consumption of calorie-dense foods and soft drinks, as well as the introduction of the television also contributed to the increases seen in obesity and diabetes (Rull, et al., 2004).

Early onset of diabetes in Mexicans contributes to an increased number of persons affected by chronic complications due to increased years of hyperglycemia (Rull, et al. 2004). A review of data from the 2000 National Health Survey completed in Mexico found persons with early-onset diabetes had higher rates of obesity, insulin resistance, high blood pressure and dyslipidemia (Gallegos, et al., 2006). Eighty-six percent of the people interviewed had at least one cardiovascular risk factor in addition to
diabetes. This survey also showed a 13% rate of diabetes within the sample under the age of 40 as compared to a rate of 8.2% found in the general population. In coming years, the incidence of diabetes is expected to increase at an exponential rate, considering that 75% of the 97 million inhabitants of Mexico are less than 40 years of age (Aguilar-Salinas, 2003).

A positive Micral test, measuring micro-albumin in the urine, was present in half of the patients in Mexico from the 2000 National Health Survey (Rull, et al., 2004). This is considered a precursor for development of diabetic nephropathy, indicating a population at high risk for development of renal disease. Therefore it is not surprising that in 2005, nephropathy was responsible for 73% of the national expenses for treatment of chronic diseases in Mexico (Rull, et al., 2004).

Pathophysiology of Diabetes

Genetic factors in the development of T2DM remain a topic of ongoing research. According to Michael Boehnke of the University of Michigan, the genes involved in T2DM have been difficult to unravel due to the many behavioral and environmental factors that impact development of the disease (Bailey, 2007). Collaboration of three groups of scientists, studying over 32,000 patients, resulted in the identification of four genes that are associated with development of T2DM and six others that may be implicated (Diabetes Genetics Initiative of Broad Institute of Harvard, 2007). T2DM is known as a polygenic disorder because it is associated with interplay of both genetic and environmental factors.
There are two metabolic defects that characterize T2DM: a decreased ability of peripheral tissues to respond to insulin, also known as insulin resistance, and beta-cell dysfunction demonstrated by inadequate production of insulin in response to insulin resistance and hyperglycemia (Maitra, 2005). Insulin resistance (IR) is found in most patients with T2DM, and clearly appears in all obese T2DM patients (Maitra, 2005.) IR leads to decreased uptake of glucose in skeletal muscle and adipose tissues as well as impairment of the hormonal controls in the liver related to production of glycogen. These mechanisms of IR lead to hyperglycemia, with increasing need for insulin. Early in the disease, there is compensatory beta cell hyperplasia which allows the body to maintain normoglycemia. However, eventually the beta cells begin to fail, demonstrated by impaired glucose tolerance and finally by the development of diabetes (Maitra, 2005).

There are clear links between obesity and IR, especially the presence of central or abdominal obesity (Maitra, 2005). One possible cause is the increase of free fatty acids (FFAs), deposited in muscle and liver tissues of obese individuals. These FFAs most likely decrease the activity of key insulin-signaling proteins. Another theory relates to the role of adipokines in IR. Adipose tissue releases hormones called adipokines or cytokines in response to metabolic activity. Dysregulation of adipokine secretion such as Leptin, one of the adipokines that acts on the central nervous system receptors, may prevent signals from being sent to the brain to reduce food intake (Maitra, 2005).

Diabetes Self-Management Education

The curriculum of diabetes self-management education addresses areas of core content, identified by the American Diabetes Association. The following areas may be
included depending upon the needs of the patient determined during initial assessment (Mensing, 2007). These key areas include: description of the diabetes disease processes and treatment options, incorporation of appropriate nutritional management, addition of physical activity into lifestyle, utilization of medications for therapeutic management, ability to self-monitor blood glucose and thereby improve blood sugar control, prevention, detection, and treatment of complications, goal setting and problem solving to related to healthy living, and promotion of psychosocial adaptation in daily life.

The core content of DSME is presented in light of behavior change; the goal of diabetic education adopted by the American Association of Diabetes Educators (AADE) (Mulcahy, 2003). As this process of teaching patients with diabetes has evolved, the following aims have been identified by the AADE:

1. To provide knowledge and skill training
2. To help individuals identify barriers to successful management
3. To facilitate problem solving and coping skills

The AADE created a list of seven key behaviors to serve as targets for modification during educational interactions including: being active or exercising, healthy eating, taking medication correctly, self-monitoring blood glucose, problem solving; including high and low glucose levels and sick day care, reducing the risks of diabetic complications, and the psychosocial adaptation to living with diabetes (Mulcahy, 2003).

Standards for outcome measurement of DSME are defined by the AADE in light of behavior change in the seven key areas listed above. They suggest evaluating self-care
behaviors at baseline and at regular intervals after the educational intervention. In addition, outcomes can be measured related to clinical and health status such as Hemoglobin A1c, lipids, protein in the urine, blood pressure, smoking cessation, height and weight, and patient satisfaction (Mulcahy, 2003). Use of the Self-Care Activities (SDSCA) measure, in the format of a brief questionnaire, is a valid tool for evaluation of behavior change (Toobert, 2000).

Despite the best educational efforts, researchers have found that knowledge does not necessarily equate with changed behavior. In a review of 72 randomized controlled trials the authors conclude that didactic style teaching has evolved into a more “collaborative model” based on the use of empowerment strategies (Norris, 2001). The goal of this new philosophy of education is to spark a change of attitude and motivation that is needed to help the client integrate the new behaviors into his/her lifestyle. This is described by Whittemore (2002) as an active process whereby the client must acknowledge vulnerability and perceive the seriousness of his/her diagnosis to move forward. The process continues when clients become hopeful or believe in their ability to make the needed changes, they actively engage in the health promoting behavior, and integrate it into their lifestyle. To increase the likelihood of success of this project, attention will focus on active collaboration between provider and the person with diabetes, to achieve increased self-efficacy.

Self-Efficacy and Diabetes Self-Management

There is growing acceptance in the literature that self-efficacy plays an important role in self-management skills. Based on Social Cognitive Theory (Bandura, 1997), self-
efficacy is defined as the perceived ability by the patient to perform a skill successfully. In this way, self-efficacy addresses the level of self confidence that sustains patients as they attempt to learn new behaviors to manage diabetes. Lorig, Ritter, & Gonzalez (2003) developed a program, *Tomando control de su Salud* (Taking control of your health), using several activities planned to increase self-efficacy. These 6 week community based study of 327 Spanish speaking patients with chronic disease such as diabetes included the following forms of social persuasion: modeling of healthy behaviors by group leaders, modeling of healthy behaviors among group members during group sessions, preparing weekly action plans to enhance skill mastery, discussing symptoms to validate their meaning, and working in groups on menu planning. The researchers found improvements in health behaviors, health status, and self-efficacy at four months and at one year. These findings led researchers to believe that participants were retaining their new knowledge and behaviors. In the study, *El Camino a la Salud* (The road to health), Social Cognitive theory was utilized to build self-efficacy in a group of 151 Hispanic or African American participants (Two Feathers, 2005). The groups were divided and culturally relevant programs developed for the two groups. This was achieved by tailoring the program to build ethnic group identity and social support, using stories to correct misconceptions regarding living with diabetes, and hands on activities to enhance participant capability; all of which increased self-efficacy (Two Feathers, 2007). Significant knowledge and behavioral changes on the part of their participants, which resulted in lower overall blood sugars, were reported by investigators.
Cultural Tailoring of DSME

Culture affects one’s view of the world, guides beliefs, practices, and interactions with others and includes actions taken related to health and illness. Cultural beliefs are passed from one generation to the next, forming structure and meaning within the community (Luggen, 2001). This definition of culture includes concepts of attitude, belief, and ideology (Purnell, 2003). Attitudes or state of mind about culture is learned and do not have to be proven; instead they are accepted by those of the same culture as true.

In order to create teaching materials for persons of another culture, it is imperative to be aware of the concept of cultural sensitivity. This concept denotes giving honor and respect to the beliefs of those from another cultural background. This includes learning about another’s culture and providing health care interventions that are specifically tailored for that culture (Luggen, 2001). Dr Leininger has been instrumental in bringing the issue of cultural awareness to the forefront in nursing. She is an early nurse anthropologist who explored the relationship between culture, health, and illness and coined the term *transcultural nursing*. Within two decades of Leininger’s pioneering work, diabetes research began to explore the relationship between culture and diabetes self-management education (Oomen, Owen, & Suggs, 1999). A request by Congress in 1999 to the Institute of Medicine (IOM) to investigate the extent of racial and ethnic disparities in health care may have accelerated the pace, increased funding, and increased the validity of doing such research. A report by this agency (IOM, 2002) documented that ethnic and racial minorities are likely to receive lower quality of health services and
encouraged health care providers to examine their practices, searching out opportunities to correct the disparities.

Culture plays a role in patients’ perceptions of their ability to internalize lifestyle changes. The success or the lack thereof, of internalization affects the adoption of behavior changes encouraged in DSME. Brown & Hannis (1999) conducted a groundbreaking study in Starr County, Texas, that investigated the ability of Mexican Americans to self-manage their diabetes. Their research findings suggest that knowledge about health risks does not necessarily equate with healthy behavior. Instead, they discovered through focus groups that many residents believed their diabetes could not be controlled and that eventually everyone in their community would have the disease. This fatalistic outlook may serve as a barrier to making lifestyle changes, and it needs to be evaluated for its impact on self-management strategies (Caban & Walker, 2006). A perception of powerlessness may impact the patient’s willingness to accept responsibility for high blood sugars related to poor eating choices. This outlook may also explain the belief that control over disease rests within God’s control only rather than in the patient’s, thereby releasing the patient from responsibility for his or her own actions.

The fatalistic viewpoint is a controversial topic, not necessarily shared by all generations of Mexicans or equally embraced by all researchers (Brown, 1998). The Starr County research utilized a taped interview with a local priest who effectively refutes the idea of fatalism as a punishment for previous sins (Brown, 1999). A recent study addressed fatalistic outlook by reframing negative expressions such as, “Only God can
decide if I will suffer complications of diabetes”, with a positive statement such as, “God helps those that help themselves” (Lujan, 2007).

In the Mexican American culture, the concept of *familism*, the valuing of family considerations above individual needs, is significant to the health status of each member. Multiple studies have acknowledged the strength of family ties within the framework of diabetes self-management strategies (Brown, 2002; Lorig, 2003; Two Feathers, 2005; Vincent, et al., 2006). A study by Wen, (2004) examined the relationship between diabetes-specific family support and self-care behaviors among older Mexican Americans and concluded that family support, specific to diabetes, is a predictor of successful diet and exercise self-care behaviors. Family support, while important for all patients with diabetes, is especially important for the Mexican American with diabetes. Some suggestions made by the researchers (Wen, 2004; Brown, 2002; Lorig, 2003; Two Feather, 2005) are to include family members in education sessions and encourage them to support the patient in lifestyle changes related to diet and exercise.

Taking the concept of familism one step further, Brown & Hanis (1999) suggested looking at the effects of an intervention on other family members who are at risk for diabetes as an indirect benefit of living in the same household with a participant. Whittemore (2007), in her review of culturally competent interventions, suggested further research is needed to identify strategies that involve the spouse and children of the participant. She believes this will increase patient motivation and could benefit the Hispanic population as a whole by encouraging behavioral changes within the entire
community. In a population expected to face serious increases in the incidence of diabetes, involving the children could evolve into a much needed preventive strategy.

Stress and culture, or the experience of living with diabetes is a common theme in studies done in the Hispanic community. High levels of stress have been associated with poorer glucose control (Heisler, 2007). Results of a focus group study done with Latinos, suggest that being diagnosed with diabetes is a stressful experience and individuals are often ill prepared to manage their stress levels (Vincent, et al., 2006). Additionally, the focus group participants believed that Latinos experience more stress as a result of culture and the central role of family. A pilot intervention study of 15 adult Mexican American women with T2DM living on the U.S.-Mexico border showed that over 80% experienced mental health problems demonstrated by sadness, hopelessness, and low self-esteem; with 40% reporting difficulty managing stress (McEwen, et al., 2007). Despite these findings, a review of culturally competent interventions for Hispanic adults, found that out of 11 studies done, only one incorporated psychosocial or quality-of-life outcomes in the evaluation of the intervention (Whittemore, 2007). Clearly, a culturally tailored strategy for Hispanics must address the increased stress encountered by these clients, with outcomes focused on improved quality of life.

The impact of culture on food choices, the role of food within the family structure, and the choices of food available to the patient, all impact the development of successful strategies. The recognition of cultural preferences in dietary choices has been shown to have positive benefits in a number of lifestyle interventions. Brown & Hanis (1999) noted that many patients in their study had been told repeatedly by dieticians to
change their eating habits by avoiding Mexican-American food. However, these participants resisted this approach. One participant was even quoted as saying, “I’d rather die younger than live a miserable life, not able to eat foods I like.” A more effective intervention approach, therefore, was to teach participants and/or family members a healthier approach to preparation of traditional foods, such as substituting healthy oils for lard or butter. Brown (2002) took into consideration Mexican-American dietary preferences and provided food demonstrations based on healthy adaptations of favorite Mexican-American recipes. The researchers also had dieticians take groups of patients to the local grocery store to learn about reading food labels. Another example of this approach to nutritional education is demonstrated by a pilot study conducted at Fair Haven Community Health Center in New Haven, Connecticut with 16 Latino patients with T2DM. This intervention included Latino foods for breakfast and lunch, prepared according to guidelines by the American Diabetes Association (Mauldon, 2006). In addition to these meals, the researchers provided participants with nutritional handouts prepared at appropriate literacy levels, which suggested menus specific to Latino diets. The intervention emphasized teaching the patients to prepare tasty food in a healthy manner, using ingredients from local markets. The study results showed that patients reported fewer food-related feelings of deprivation and improvement in blood sugars.

An example of diabetes research in Mexico shows some differences and some similarities when compared to work being done in the U.S. In a study completed in Nuevo Leon, Mexico, by Gallegos (2006), the needs of the patients were first identified. In this quasi-experimental design a sample of 45 adults with T2DM participated, 25 in
the experimental group and 20 in the comparison group. The problem areas identified included difficulty understanding and applying information regarding their diabetes, inability to organize their daily routine, including aspects of treatment, and trouble changing their eating habits. Based on these findings, an education and counseling program was designed to help patients with these aspects of daily life (Gallegos, 2006).

The intervention consisted of six educational sessions, and an average of 20 individual counseling sessions over 50 week’s time. Counseling sessions were provided, either in the patient’s home or by telephone. During each counseling session, the patient and counselor set goals for specific behaviors, for example reducing tortilla consumption at each meal. The participants committed to achieving the goal, and the counselor checked during the next counseling session to see if the goal was obtained. Patients in the experimental group had decreased HbA1c measurements beginning at 3 months and maintained the lower levels for 12 months after the beginning of the intervention. This intervention, completed in Mexico, was unique in that the researchers provided education and counseling, in areas the patients identified as a priority. An active, participatory teaching-learning process was tested (but not well explicated), with a goal of helping participants take responsibility for self-care. The use of short term, achievable goals proved to be a successful intervention strategy (Gallegos, 2006).

The experience of Mexican adults living with diabetes was examined in a qualitative study completed in Guadalajara, Mexico (Garcia, 2007). This research consisted of interviews with 31 matched pairs of adult patients with T2DM who had good control and patients with poor control, and attempted to identify behaviors associated
with good control. One striking difference between the two groups was in their acceptance of their diagnosis. The good control patients (GCPs) reacted to the diagnosis in a negative manner initially, showed feelings of loss, and ultimately acceptance. In contrast the poor control patients (PCPs) were found to have problems accepting their diagnosis and were more likely to use popular or folk explanations for the cause of their diabetes. Overall, GCPs seemed to have more knowledge about diabetes. They were more likely than PCPs to know the recommended target range for blood sugar control. Differences in dietary patterns were also found. GCPs consumed more nopales and seemed more familiar with the different types of fruits available during different seasons. They also ate more chicken and fish, used non-caloric beverages to satisfy their desire for more food, and understood what their blood sugar level should be. PCPs reported increased consumption of animal fat and cholesterol, with GCPs adapted a healthier version of a Mexican diet, eating corn tortillas in lesser quantities, avoiding foods high in saturated fat, and integrating more exercise into daily life. PCPs were reported as knowing what they needed to do, but not internalizing it. GCPs also reported fewer emotional problems and more support from family. GCPs reported more faith in prescribed medications, which likely influenced their compliance, and therefore better achievement of control.

One telling statement from a patient with good control summarizes the experience of diabetes for the patient: “…the physician does not believe there are things you cannot control, they believe in managing the disease pharmaceutically, but they do not live it, because we feel it, we live it.”
Health Literacy and Diabetes Self-Management

The topic of health literacy has been identified by Healthy People 2010 as a communication goal for health professionals (US DHHS, 2001). In the initiative, two focus goals are set to meet national objectives for an increase in health literacy: development of appropriate written materials for audiences with limited literacy by use of existing resources to create plain language health communications targeted to this population and improvement of reading skills of persons with limited literacy. There is a closely interwoven relationship between the concepts of literacy and health literacy. In addition to literacy skills, health literacy requires knowledge of health topics. The Institute of Medicine defines health literacy as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (IOM, 2004). To accomplish health literacy, one must be able to read and comprehend complex texts. Even those with strong literacy skills may have trouble obtaining, using, and comprehending health information (IOM, 2004).

An association between lower levels of health literacy and increased hyperglycemia has been documented by researchers in clients who have less education, are immigrants, and also in older persons (Schillinger, 2002). Health literacy is a concept with far reaching consequences. For example, a diabetic client with low literacy skills may struggle to read the directions on a pill bottle, not understand the meaning of a low blood sugar, as well as lack the cognitive ability to understand the risk involved in
continued high blood sugars. The skills required to manage diabetes are many and complex, which may cause the patient to feel inadequate or powerless. A randomized trial completed by Rothman (2004) found that lower literacy patients were more likely to benefit from an intervention, when literacy was addressed. The researchers addressed low literacy by focusing on specific critical behaviors such as decreasing the complexity of information, giving concrete examples, and using “teach back” to ensure comprehension.

The tendency that clients with low literacy have to answer questions, regardless of their comprehension of the question was discovered during cognitive interviews of low-literate Hispanics (Rosal, 2003). Rosal speculates that overly general instructions, confusing wording, abstract concepts that were difficult to understand, or unfamiliar terminology may confuse patients with low literacy levels. This shows the importance of using very specific wording and concrete examples when working with low-literate clients. In addition to assessing literacy levels, incorporating strategies to address both low literacy and low health literacy must be considered in designing DSME programs or interventions (Whittemore, 2007).

Theory

DSME includes three distinct topics: education about diabetes, education regarding new technical skills required for self-management and the acquisition of new health behaviors. The Health Promotion model (HPM) will be used to address and evaluate behavior change required for successful diabetes self-management. The HPM
proposes a multidimensional nature in persons as they interact with their own interpersonal and physical environment (Pender, 2002). (See Figure 1).

FIGURE 1. The Health Promotion Model

The theory that provides the underpinnings for the HPN is the Expectancy-Value Theory. According to this theory, behavior is rational and economical. For example, a person will engage in an action if the action is of positive personal value and to the degree that according to available information, the action will bring about the desired
outcome (Pender, 2002). In addition to the value of achieving the outcome, most individuals will not put forth effort if the goal is perceived as impossible to achieve. Motivation to change is based on prior knowledge of personal success, or the success of others in attaining the goal, and personal confidence in one’s ability. This concept has its beginnings in Social Cognitive theory (SCT) which places emphasis on self-direction, self-regulation, and perception of self-efficacy (Bandura, 1997). This theory proposes that the stronger the self-efficacy, or the perception of ability to accomplish a task, the more likely the person will engage and persist in a task. As documented in the review of literature, many strategies utilized in DSME are based on increasing self-efficacy to enhance behavior change (Brown, 2002, Lujan, 2007, Two-Feathers, 2005, Heisler, 2007).

*Application of Theory to DSME Proposal*

Specific assumptions of the HPN of interest for this proposed DSME program include: the belief that persons have the capacity for reflective self-awareness, including assessment of their own competencies, health professionals are part of the interpersonal environment, which exerts influence on persons through the life span, and underlying these assumptions is the active role that the client takes in shaping and maintaining health behaviors (Pender, 2002).

One theoretical proposition of the HPM utilized in the development of this DSME program is the following: persons commit to new behaviors to the extent that they anticipate gaining personally valued benefits (Pender, 2002). By utilizing empowerment approaches (Anderson & Funnell, 2000), the educator works with the client to identify
learning needs and goals that are an area of dissatisfaction or personal concern. Gallegos (2006) utilized an assessment of the patients’ needs to direct the education and counseling intervention completed in Nuevo Leon, Mexico. Participants were also encouraged to take responsibility for self-care. Additional theoretical propositions of the HPM are directed at increasing self-efficacy. These propositions state that perceived competence or self-efficacy to execute a given behavior increases the likelihood of commitment to action and greater perceived self-efficacy results in fewer perceived barriers to healthy behaviors (Pender, 2002). This proposed DSME intervention will address increasing self-efficacy by structuring the program to provide positive experiences for the participants, for example, creation of short term goals that are attainable. A third theoretical proposition of the HPM relates to the importance of interpersonal influence by families, peers, and the educator, to support and increase commitment of the client towards adoption of the healthy behavior (Pender, 2002). As discussed in the review of literature, the importance of family within the Mexican culture cannot be underestimated. Including the family in DMSE interactions is used to increase support for the client. Group meetings allow participants to share successes and learn problem-solving techniques. Socio-cultural factors as addressed in the review of literature are listed as personal factors by Pender, and further influence the behaviors adopted by the client. These will be addressed in the intervention by considering the influence of stress, food choices, familism (valuing family above self), and assessment of fatalism in the Mexican culture. Lastly, the health literacy level of the population is considered in
presentation of educational materials and low literacy strategies are utilized to ensure comprehension.

Summary

The review of literature included research on prevalence, pathophysiology and complications of type 2 diabetes. The literature reflects the world-wide burden of diabetes and specifically the increase noted in Mexico. The pathophysiology of the disease demonstrates the correlation between a rise in obesity and the rise in T2DM. The concept of DSME is explored, including core content, key behaviors, and cultural tailoring, including elements that are important in the Mexican culture. Health literacy as an important factor in successful education was explored, including specific strategies for implementation in the proposal. The HPM is used as the underlying theory to guide the intervention, with an emphasis on empowerment strategies and increasing self-efficacy.
CHAPTER THREE

Introduction

Chapter three presents the culturally tailored diabetes self-management program for Mexican adults with T2DM. First an overview of the program is provided, including examination of strategies that have shown to be effective in prior studies, completed with a similar population of patients. Then an exploration of what it means to culturally tailor an education program follows with a definition provided by the AADE. The chapter continues by evaluating the program based on the Health Promotion Model. In addition, an assessment of low literacy strategies is reviewed. The chapter continues with a description of the program including the sample and setting as well as a discussion of the education modules developed for use. The proposal will be evaluated based on changes in participant knowledge, behaviors, biological measures, and satisfaction of key players.

The primary purpose of the proposed project is to improve glycemic control in Mexican adults with T2DM through adoption of key self-management behaviors. The education program consists of six modules that address core diabetes self-management content as identified by the AADE. Successful implementation of the program will be measured by changes in key behaviors required for successful diabetes self-management, change in hemoglobin A1C, and patient satisfaction with the intervention. Details regarding the cultural tailoring of standardized diabetes educational content are presented. Didactic and experiential content and presentation of materials and strategies have been modified to meet the needs of low-literate adults.
The project utilizes educational strategies that have proven effective in other projects. According to the literature, interventions that address diabetes knowledge, related complications, the role of diet and exercise in glucose control, the relationship between diabetes and stress, problem solving, and goal setting for behavior changes are most effective in lowering hemoglobin A1c and thus preventing future complications (Brown, et al. 2002, Lujan, et al. 2007, Rosal et al., 2005, Two Feathers et al., 2005; McEwen, et al., 2007). Successful teaching strategies include the use of audio-visual teaching aids, visits to local markets, and food preparation demonstrations. Support groups, often lead by community health workers increase the likelihood of success with the Latino community (Brown, et al., 1999, Lujan, 2007, Two Feathers, et al., 2005).

Most diabetic interventions target clinical outcomes such as decreased blood sugars reflected by lowered hemoglobin A1C as well as behavioral outcomes such as adoption of healthy eating or increased physical activity, and integration of new knowledge about diabetes (Brown, 2002, Gallegos, 2006, Two Feathers et al., 2005). However, interventions frequently do not address the psycho-social issues of living with diabetes, despite the fact that depression affects quality of life, impacts glycemic control, and correlates with higher associated morbidity (Cherrington, et al., 2006). Depression is twice as likely to occur in adults with diabetes as adults without diabetes and has been demonstrated to negatively impact glycemic control (Anderson et al., 2001). Clearly interventions that incorporate essential diabetes knowledge with skills for managing stress and depression are needed (Whittemore, 2007).
Cultural Tailoring of Diabetes Self-Management Strategies

The AADE code of ethics calls for providing services with respect for the uniqueness, dignity, and autonomy of each individual patient/client. A task force of the AADE defines cultural sensitivity as the extent that ethnic characteristics, experiences, norms, values, behavioral patterns and beliefs of a population are incorporated into the design, delivery, and evaluation of health promotion material and programs prepared for a specific population (Jack et al., 2002). The adaptation of materials for an ethnic group, for the purpose of creating a culturally sensitive intervention could be described as cultural tailoring of materials (Jack et al., 2002). For the Hispanic population, this might include tailoring of class content related to types of food, beliefs about health, and the use of music (Whittemore, 2007). The utilization of a community lay workers, also known in several studies as promotoras, are found to be an effective method of training bilingual clinic employees in diabetes self management (Lujan, 2007). The promotoras taught classes, provided support to participants, and translated information about diabetes into culturally relevant life experiences.

A barrier to understanding educational information occurs when the material is not provided in the native language of the participant (Meiner, 2001). A review of culturally competent interventions found that all studies provided education in the patient’s native language and recognized the importance of doing so (Whittemore, 2007).

Another means of tailoring a diabetes self-management program is to include family members in the educational sessions. This is important due to the central role of the family in the Mexican culture (Wen, 2004). By involving the entire family in healthy
diet and exercise activities, the community as a whole stands to benefit, and a measure of prevention of diabetes in the younger family members may occur (Brown, 1999). The concept of familism is described as a “deeply ingrained sense of the individual being inextricably rooted in the family” (Bacallo & Smokowski, 2007, p. 53.). By helping the family understand the importance of lifestyle change for the person with type 2 diabetes, we hope to foster family support.

Several studies suggest that fatalism can be a barrier to adopting new behaviors (Brown & Hanis, 1999, Caban, 2006). The belief that diabetes cannot be controlled, and eventually everyone in the community will have the disease can be an obstacle to behavior change. One study found success with reframing fatalistic viewpoints by mailing postcards to participants with messages such as: “With God, everything is possible, control your serving sizes”. These faith based messages were shared as a means to reinforce the relationship between faith and diabetes self-management (Lujan, 2007).

The role of food within the family and specifically within the Hispanic culture requires DSME to focus on behavior changes that are acceptable to the population. Modification of traditional foods to include strategies for increasing dietary fiber, fruits and vegetables as well as methods for reducing dietary fat and sugar were used in an intervention that showed significant lowering of blood sugar (Two Feathers, 2007). Dietary surveys were used in this intervention to heighten awareness of eating habits, for example, participants were asked the number of servings of fruits and vegetables, fried or sweet foods, whole grains, and regular soda consumed each day. They were also
questioned about cooking practices, such as if they poured off fat after cooking meats. In this study, dietary knowledge was a predictor of dietary behavior (Two Feathers, 2007).

Although infrequently addressed in the research literature, the added stress of living with diabetes is an important cultural consideration. In one study, Hispanic persons reported a higher level of stress as a result of the central role of the family and extended family (Vincent, et al., 2006). A feeling of anger or profound sadness related to the demands of diabetes is described by participants in another qualitative study (Adams, 2003). A recent study investigating the effect of depression on glycemic control in Hispanic patients showed that the probability of poor glycemic control increased in direct proportion to the severity of self-reported depression (Gross, 2005). Clearly an effective intervention addresses the experience of living with diabetes, identifies those at risk for depression, and helps participants identify ways to reduce stress (Fisher, 2007).

Testing Intervention Based on Health Promotion Model

Self-efficacy, or the perceived ability to succeed at a task, is a common target of DSME as well as a key variable in the HPM. The level of self-management achieved by the patient depends largely on the individual’s confidence in his/her ability. The fourth theoretical proposition of the HPM states: “Perceived competence or self-efficacy to execute a given behavior increases the likelihood of commitment to action and actual performance of the behavior” (Pender, 2002, p.63.) This commitment to action affects the patient’s motivation, participation, and overall success (Krichbaum, 2003). The intervention entitled Tomando Control de su Salud (Taking Control of your health), utilized activities to enhance self-efficacy such as leaders modeling behaviors, weekly
action plans to enhance skills mastery, discussion of symptoms to assist participants in correctly interpretation of these symptoms, group work on menu planning, and group problem solving as a type of social persuasion (Lorig, 2003).

Another strategy to improve self-efficacy includes the use of empowerment strategies such as helping participants identify challenges related to living with diabetes, set goals related to problem areas that are identified, learn to problem solve, address barriers to self-care, cope with stress, and gain social support from friends and family members (Anderson, 2000). This is a non-traditional approach to diabetes education that calls for an increased level of involvement on the part of the patient. Assessment of the patient’s knowledge about diabetes as well as concerns and barriers that the patient faces, allows for a more meaningful exchange of information. DSME using this approach includes less lecture and more interactive skill development training and problem solving (Anderson, 2000, Krichbaum, 2003). The use of group meetings focused on problem solving and sharing successes, is another method useful in building self-efficacy skills (Anderson, 2000).

According to the HPM, personal factors within the context of biological, psychological and socio-cultural beliefs are relevant in the prediction of a given behavior (Pender, 2002). When working with a diverse population, health promotion interventions should provide information in the appropriate language, at appropriate literacy level, and in the context of the individual’s health beliefs and practices (Pender, 2002). Other considerations might include cultural awareness, which includes an appreciation and sensitivity to other’s values, beliefs, and practices (Jack, et al., 2002). This might include
the use of culturally tailored education regarding nutrition, religious beliefs, and acknowledgement of culturally induced stress produced by living with diabetes. Understanding the role of the family in health within the Hispanic culture requires involvement of family in health promotion activities (Pender, 2002).

**Provision of Low Literacy Oriented DSME**

This program takes into consideration the literacy and health literacy level of the participants. A primary concern when preparing materials used in health education is to improve the readability of the materials (Doak, 1996). Typically, health education materials are prepared at a reading level of 10th grade or higher (Hohn, 1998). Ideas for rewriting materials include the use of shorter sentences that are simple and clear, the use of culturally appropriate graphics, active voice, and user friendly layout (Doak, 1996). Other recommendations include involving the target audience, limiting objectives and message, using an interactive approach, and testing as well as revising materials (Doak, 1996).

An evaluation of written materials is only a small part of the adaptations required to meet the needs of persons with low levels of literacy and health literacy. The communication of health information between provider and patient requires the use of language the patient can grasp as well as efforts by the provider to assess patient understanding. A focus group of low-literate Hispanics noted that the following teacher characteristics were important: being friendly as well as knowledgeable, being willing to repeat things as many times as necessary, and checking frequently to see if patients understood the materials (Rosal, 2004).
A third approach to education in patients with low health literacy skills is to create a participatory learning environment. This active learning approach is connected to the patient’s everyday life, by addressing self-identified needs and interests (Hohn, 1998). This technique, known as an empowerment approach to health literacy helps the patient develop new beliefs about capacity and confidence to handle self-care. The use of an empowerment approach reflects back to the HPM, with the end result being increased self-efficacy.

Educational Program

The overall purpose of this project is to develop a diabetes self-management program for use with a low-literate population in rural Mexico. The goals of the educational program are to:

1. Provide educational resources for the patients concerning the knowledge and skills needed to successfully self-manage their diabetes.
2. Encourage and foster positive behavior changes related to living with diabetes by employing strategies that strengthen self-efficacy.
3. Reduce the risk of future complications by improved diabetes self-management and lower blood sugars.
4. Evaluate participant outcomes related to diabetes knowledge, behavior change, biological measures, and satisfaction of key players.

Description of the Sample and Setting

The village of Puerto Adolfo Lopez Mateos lies on the Pacific Coast of Baja Sur, California, approximately two hundred miles north of Cabo San Lucas. The Phoenix
chapter of the Flying Samaritans adopted this village of approximately 2,000 at the
villager’s request, after Flying Sams members took a whale watching trip out of the
harbor. An economic downturn in 1990 occurred in Lopez Mateos when the local fish
cannery reduced it’s workforce from 1200 to 100 persons, resulting in an 80%
unemployment rate. The majority of the patients do not meet the Federal requirements for
government health services, and those who have private insurance must drive two hours
south to the city of Constitucion for care. The sole provider of care in the village is the
Paisano, similar to an intern in our medical system. The clinic was first held in 1995 in a
termite infested house, considered uninhabitable by the residents of town due to structural
damage. In 2001 the cannery donated land for a new clinic; which provides general
medical, dental, optometry, and chiropractic care for up to 350 patients each month.
These patients, coming from distant outlying areas, as well as Lopez Mateos, often arrive
the night before clinic and camp in tents or stay with relatives to be first in line for a
number to receive care.

The need for diabetes education and care became increasingly apparent to the
providers of care at the clinic. Patients routinely presented to clinic with blood sugars in
the 300-400 range. Diabetes complications such as foot infections and visual impairment
were often seen within the population. Diabetes classes began in October, 2006 with five
patients enrolled, although the addition of family members caused the group to overflow
from the small room where they met. The class size is now 24 patients, with continuing
referrals from the providers at the clinic. There are currently two nurses who take turns
making the trip to Lopez Mateos to teach the diabetes class. At this time, a dietician who is willing to attend the clinic has not been located.

The trip begins early the second Friday morning of each month with as many as 17 small engine planes leaving from airports throughout the Phoenix area to land first in Guaymas, Mexico. After clearing customs, the planes fly due West to Mulege on the Sea of Cortez where volunteers spend the night at a hotel with a dirt landing strip for small aircraft. Early Saturday morning, the planes take off for the 40 minute flight across the Baja to the village of Lopez Mateos. The planes must return to Mulege before sundown as there are no lights on the hard packed dirt runway. Each trip requires a full, three day weekend, and volunteers are responsible for all costs, including a share of the fuel.

The diabetes clinic population primarily has T2DM and over half are women, ages 50 and older. The nurses find the patients to be friendly and appreciative of the classes, however few changes have been noted in the patient’s blood sugars. One patient frequently arrives at class with a 20 oz bottle of regular Pepsi in hand, another brings fried treats to share with the class, and a third describes how she adds lard and sweetened condensed milk to her bread pudding to enhance the taste. The participants speak Spanish but only one of the nurses is conversant in Spanish. The Flying Sams use translators throughout the clinic, and one is available to translate during the diabetes class.

Description of the Modules

The proposed educational modules will be utilized during the ten months the clinic is in session, October through July. The first of the six modules is planned as individual meetings with each patient; the other modules are conducted with the entire
group. The December meeting is planned as a fiesta, with the sharing of healthy snacks. Some months will not have an educational session but instead the time will be devoted to individual lab testing and counseling.

The format for each meeting is as follows: patients will sign in, and receive the handout for the day’s class, participants will be welcomed, and a brief review of past classes will be given, followed by review of goals set by participants in prior class. Did they encounter any barriers to behavior changes? A discussion will follow on the current topic followed by a review of key points presented in the class. Each class will include a time for questions and answers from the participants and will conclude with goal setting related to the day’s current topic. By allowing for review of materials and taking time for questions, participants with low-literacy skills receive extra opportunities to assimilate information (Rosal, 2004).

Module 1

The aim of this module is to become acquainted with each patient, help him/her identify problems and learning needs, and establish current level of diabetes control by checking level of hemoglobin A1c. This is an opportunity for the nurse educator to become acquainted with the patient and to inquire about his/her family. Establishing relationships with the patients by inquiring about their families promotes better communication and utilizes a culturally sensitive approach (Lujan, 2007). If the patient has any family members who would like to be included in this session, the family member will be welcomed. The nurse will ask the patient if she can take a picture of the
patient with his/her family to help each nurse become acquainted with the patients and their families, enhancing cultural sensitivity.

Spending time with the individual will allow the educator to explore with the patient his/her current knowledge about diabetes, to determine areas of primary concern, and to help the patient identify barriers to self-care. Addressing barriers to self-care will be done utilizing an empowerment approach, with a goal of increasing self-efficacy (Anderson, 2000). Using open ended questions may be helpful during this meeting. Potential questions are: What gives you the most trouble about caring for your diabetes? Can you share with me what is most difficult or causes you the most frustration? How do you feel about diabetes? What can we do to help you? How can we work together to make a plan to address this concern of yours? What questions would you like to discuss in future classes? These types of questions are the key to interactive learning and help patients develop critical thinking skills (Anderson, 2000). Beginning the series of educational sessions with problems identified by the patient shows a willingness to focus on his/her agenda thereby allowing the patient to set more meaningful goals (Anderson, 2000).

This introductory meeting will use a handout entitled: “Understanding Diabetes, testing Hemoglobin A1c,” from the Migrant Clinicians Network, State of Texas. This is a colorful handout with a traffic light depicting the range of normal for Hemoglobin A1c and the corresponding blood sugar levels: 4.0-7.0 (green), 7.0-9.0 caution (yellow), and 9.0-12.0 dangerous (red). Adjacent to the traffic light are pictures showing the damage produced by high blood sugars to the heart, vision, kidneys, and the nerves of the hands.
and feet. Symptoms of low blood sugar are portrayed with pictures. The lower portion of
the handout has space for the patient to write goals related to taking medications,
exercising, healthy eating, and controlling weight, accompanied by pictures
demonstrating each activity. This first meeting with the patient is on an individual basis
and Hemoglobin A1c is checked utilizing the INVIEWS A1c professional kit. The number
obtained from the test is written on the handout and clearly shows the patient in picture
form their current level of diabetes control. The individual session concludes with the
educator helping the patient set a short term goal and identify barriers and strengths
related to achieving this goal. This activity utilizes an assumption from the HPM that
patients are capable of self-reflection to increase awareness. It also addresses the
theoretical proposition that identifying barriers and making an action plan will increase
self-efficacy (Pender, 2002).

Module 2

The aim of this module is to introduce the basic principals of healthy eating,
suggest modifications to current Mexican cooking styles, and connect sound nutritional
habits to the history of those persons who lived on the Baja. The basic nutritional
strategies identified in this module include: an increase in fiber, fruits and vegetables, and
identification of methods to decrease dietary fat and sugar. The module is presented in an
interactive style, in a group format. This class begins with a discussion of the cultural
history of Baja California Sur. Class discussion centers on the history of the early
inhabitants and seeks to form a connection to the early inhabitants. Questions might
include: Did your family migrate to the Baja Sur from another location, or have many
generations lived here? For those that migrated from mainland Mexico, what area did they come from? (The Sonora area was also inhabited by similar tribes of natives). Does anyone in the class know about foods eaten by the early inhabitants? The early natives were Cochimis and Guayeuras, known for their ability to adapt to a hostile environment (North, 1908). These natives did not practice cultivation but rather practiced fishing, hunting, gathering fruits and seeds. An emphasis for this session is that the early people learned to live in harmony with the natural environment, had good health, and were strong and adaptable.

A poster is developed with help from the class, showing pictures of foods eaten by the natives including fruits, vegetables, grains, and fish. A brief discussion of cooking for good health follows, how did the early people cook their food? Is frying food a historical method that contributes to good health? Is the use of refined sugar a healthy addition to our eating choices? How can we limit sugar intake for our families? What are some things we eat or drink that are very high in sugar and fat? How does eating or drinking these items affect blood sugar? What is a portion size of rice? What about a serving of meat?

One of the goals of health literacy is to give voice to the community (Zarcadoolas, 2006). In Rapid City, SD, a diabetes educator worked with the Native American community to develop a Plains Indian Food Model. This model, patterned after the four quadrants of a medicine wheel, linked the healthy diets of early Plains Indians to today’s healthy food choices. The model was designed to confront current day practices such as deep frying as a non-traditional method of food preparation. The wheel concept
represents balance, recognized by the tribe as an integral part of being human (Zarcadoolas, 2006). The model is used in meal planning, each quadrant representing a food group of the early people such as lean meats, vegetables, fruits and juices, starchy vegetables, and water or drinks without sugar or alcohol. For some patients, this connection to an early, healthier lifestyle adds self-confidence in their ability to “return to good health.”

The plan for this module is to help patients connect to earlier, healthy eating patterns, with the hope that they too can achieve the necessary balance in their life to discover good health and to be strong and adaptable, not only for themselves, but also for their families.

Class assignments will be to form teams of two and practice planning healthy meals, using the food model and the handout. Paper plates and food models will be passed out and participants will work together in teams to plan a healthy breakfast, lunch or dinner plate, using suggestions from the poster. Participants will then be asked to share their meal plates with the rest of the class. Participants will be invited to taste healthy snacks, prepared ahead of time for the class, utilizing fruits, vegetables, nuts or grains, all foods found on the healthy eating model. The patients will increase self-efficacy by learning from each other during this discussion of healthy meal planning (Pender, 2002). They may feel some connection to the early people who lived on the Baja, and see the link between food choices, good health, and resiliency. The interactive nature of the class may be beneficial to those with low-literacy skills (Hohn, 1998). The handout for this session will show the balanced plate approach to meal planning from the Migrant
Clinicians Network, State of Texas. It includes a drawing of a brightly colored plate divided between bread, starches, grains; meats and proteins; fruits and vegetables, with additional illustrations of correct serving sizes.

Module 3

The aim of this module is to help the patient achieve balance in life, to provide an opportunity for discussion regarding mental health issues, and to give concrete examples for dealing with the daily stress of living with diabetes. Focus groups have identified stress management as a topic Hispanic client’s feel is important for inclusion in DSME (Vincent, et al., 2006). In a separate intervention utilizing focus groups, Cherrington (2006) found a direct relationship between emotional health and diabetes in Latinos. It was noted by the focus groups that diagnosis of diabetes led to feelings of hopelessness and upset, and problems with management of diabetes caused feeling of anxiety and depression. A study of Mexican immigrant women with T2DM on the border reported difficulty with interpersonal relationships, trouble with problem solving, prolonged tension, and inadequate communication skills in addition to mental health problems and difficulties managing stress (McEwen, et al., 2007). Addressing the psychosocial or quality of life implications of living with diabetes is lacking in most interventions (Whittemore, 2007).

The module will be prepared for use in an interactive group session, thereby allowing participants to see that they are not alone in dealing with issues such as stress and depression. As the patients explore stress and methods of coping, they will be able to increase self-efficacy related to skills needed for living with diabetes. This module is
based on the HPM proposition that group problem solving and skills mastery are keys to building new behaviors (Pender, 2002).

The lecture and discussion questions for this module have been taken from two sources. The first source is an outline prepared by the Michigan Diabetes Research and Training Center covering the topic “Learning to live with diabetes” (Funnell, 2000). The following topics are covered in this module: diabetes as a chronic illness, possible effects of diabetes on the way one lives, identification of self as a person with diabetes, feelings about having diabetes, living with diabetes, and getting support from others. When talking about feelings, the problem of stress is introduced. Didactic material on managing stress is taken from the program book, “Living a Healthy Life with Chronic Conditions” (Lorig, 2000). This discussion includes material related to recognition of stress and examples of successful strategies for managing stress. The effect of stress on blood glucose levels is discussed (Funnell, 2000, p. 262).

The discussion will center on what it means to live with diabetes. Some questions to stimulate discussion include: How do you feel about living with diabetes? Can you think of any stories you can share about a difficult experience related to your diabetes? Do you feel like your family helps you cope with diabetes? Who do you turn to when you need support? (Anderson, 2000) The class is asked to shares ideas about what helps them to relieve tension and stress.

The handout for this session is a brightly colored flyer entitled “Depression and Steps to Healthy Living” from the Migrant Clinicians Network, State of Texas (MCN, 2008). This flyer has pictures of various activities for healthy living, with a short
explanation of each. The class concludes with an interactive exercise in stress reduction, using music and guided relaxation techniques.

**Module 4**

The aim of this module is to help patients identify the benefits of exercise in relation to good health and specifically to diabetes, to examine barriers that prevent exercise, and to encourage incorporation of exercise into both individual and family activities.

In a study of characteristics found in patients with T2DM in Mexico, only 5.8% of the patients incorporated regular exercise into their treatment plan (Aguilar-Salinas, 2003). Qualitative research done with a Mexican-American population examined barriers and motivators for physical activity (Mier, 2007). Motivators for exercise included support by family members and a sense of well being derived from the exercise. Barriers included a lack of time, physical pain, depression, being overweight, and a lack of safe places to walk.

Today’s class will begin with a short discussion regarding the benefits of exercise. Some questions to stimulate discussion include: what activities does your family enjoy doing together? How do you feel after you take a walk, garden, or attend a dance? What happens to your blood sugar after exercises? Do you believe it would help your children and grandchildren to be more active? Is there anyone in your family that would take a daily walk with you? Is exercise good for the heart? Why? What prevents us from exercising? Encourage participants to offer suggestions for barriers that are mentioned. The benefits of walking related to weight and blood sugar control, and hypertension are
discussed. How many minutes a day do we need to exercise for good health? Is there ever a time it is not safe to exercise? What warning signs might signal the need to slow down or stop exercising?

The handout for this class is from the National Institute of Health: “Stay active and feel better”. This handout shows pictures of families with children exercising together. There are suggestions for different family activities and the suggested target for exercise is 30 minutes a day for children as well as adults. Page four of the handout has a space for the participant to set a goal for exercise. Participants are encouraged to think about a goal and write it down. At the next class they can report on success or barriers related to exercise. The participants will be given pedometers with directions for use. A prize will be awarded to the person with the most steps on their pedometer on the last day of class.

The class will conclude with instruction on Salsa dance by our translator, all participants that are able are encouraged to join the group in dancing. This module is planned to engage the entire family, utilizing the HPM proposition that interpersonal influences such as those of the family, increase support for the participant and commitment to engage in a new behavior (Pender, 2002). Empowerment strategies are utilized by encouraging the group to identify solutions to the barriers related to exercise. This increases self-efficacy and opportunities to adopt healthy behaviors (Pender, 2002).

Module 5

The aim of this module is to demonstrate testing of blood glucose, to discuss what the normal values of blood glucose are related to time of day and food intake, to
troubleshoot treatment of low and high blood glucose results, and to give a basic explanation of how medications that lower blood glucose work. Patients will have an opportunity to ask questions about medications and verify that they are correctly testing their own blood sugar. Materials for the didactic portion of this module are taken from an outline prepared by the Michigan Diabetes Research and Training Center covering the topic “Monitoring your diabetes” (Funnell, 2000).

When available, the pharmacist for the clinic will be asked to lead the portion of class related to medications, explaining how the medications work, ensuring that patients understand how to take medications. Interactive questions for this session include: Who feels very comfortable checking blood sugar? Would you mind showing the others how you check blood sugar? (Each step is reviewed during the patient demonstration). What is the best time of the day to check blood sugar? How do you know if your blood sugar is too high or too low? What can you do to treat blood sugar that is too high or too low? How does exercise affect blood sugar? How does drinking alcohol affect blood sugar? How do you think your weight affects your blood sugar? Will losing weight help lower blood sugar? Everyone misses medications from time to time, what changes might help prevent this? If you only take one medication for diabetes now, will that ever change? (Give a description of the progressive nature of diabetes). What happens if you miss doses of your medicine? What have you heard about insulin? Does anything cause you to be concerned about using insulin?

By using an interactive format for the discussion, patients can address concerns that are important to them. This utilizes the empowerment philosophy of education and
encourages patient participation in problem solving (Anderson, 2000). By identifying barriers to self-care and teaching the patient to problem solve, self-efficacy is strengthened (Pender, 2002). The module builds on the assumptions of the HPM, that the client plays an active role in shaping and maintaining health behaviors (Pender, 2002).

The handout for this class is a simple chart that shows the normal level of blood sugar for fasting, two hours post-prandial, and bedtime readings. Patients are encouraged to set a small goal related to testing blood sugars, taking medications in a timely manner, or another topic covered in today’s class.

Module 6

The aim of this module is to increase knowledge about diabetic complications and to learn behaviors that will prevent development of complications. The emphasis for this class is “Healthy living, taking care of myself”. Didactic materials for this class are taken from an outline prepared by the Michigan Diabetes Research and Training Center covering the topic, “Long term complications” (Funnell, 2000). The class will begin with a brief review of the complications that may occur when diabetes is untreated or in poor control. These include damage to: the heart and circulatory system, the kidneys, the nervous system, and the skin with delayed wound healing. While this is difficult information for the patients to hear, it is important for the following three reasons: to help patients make decisions about blood glucose goals, to motivate patients to do all they can to prevent complications, and to recognize early signs of problems so they can be treated and avoid more serious consequences (Funnell, 2000). An example might be a puncture wound in the foot that progresses to a serious infection and causes loss of limb.
A series of handouts from the Migrant Clinicians Network, State of Texas will guide the remainder of this session’s discussion. The first handout is entitled “Diabetes and High Blood Pressure”. It has a graphic representation of blocked arteries, comparing a clear vessel, or an open water hose, to a blocked vessel, or a water hose with a finger blocking the flow of water, demonstrating the principal of high pressure. The handout lists as green, yellow, and red values for blood pressure. This is a good opportunity to involve the class, to ask interactive questions regarding blood pressure, for example: What is a normal blood pressure? What can be done to improve blood pressure? Answers might include behaviors such as healthy eating, weight loss, exercise, quitting smoking, and taking medications if needed. Ask the class: Does your diet make a difference in your blood pressure? Are some foods not good for the heart? Does frying food make a difference? Does anyone know what foods are heart healthy? Is elevated blood pressure related to heart problems such as heart attack or stroke? This can lead into a discussion regarding kidney problems.

The next handout is entitled “Diabetes and Kidney Disease”. The causes of kidney disease and personal risk factors are summarized on the handout. Discussion can center on how to prevent kidney disease: Does anyone know things to do to prevent kidney disease? Answers might include behaviors such as good blood sugar control, healthy blood pressure, not smoking, exercise and eating a healthy diet, drinking at least 8 glasses of water each day, maintaining a healthy weight, and taking any medications prescribed by the doctor. This is a good time to review the use of Lisinopril, which many patients are taking, and explain its importance in prevention of kidney problems.
The next handout is entitled “The Diabetic Eye”. This handout has pictures that describe eye disease such as diabetic retinopathy, cataracts, and glaucoma. It includes a description of symptoms and suggestions for behaviors that will prevent or delay the onset of diabetic eye disease. Questions for the class include: Can eye problems be prevented for a person with diabetes? Has anyone noticed that the complications of diabetes can be avoided by the same behaviors, good blood sugar control, healthy eating, and exercise?

This class will conclude with the goal setting. If anyone wishes, they can share their goals with the class. They will be encouraged to share with their family the information from today’s class, to enlist their help in meeting goals for blood sugar and blood pressure. Since this class will be entirely didactic, participants will be asked if they would like another Salsa dance lesson or a time to listen to music and unwind with stress relieving activities. The goal of this class related to the HPM is to help participants weigh the barriers to good health against the perceived benefits of behaviors (Pender, 2002). Asking participants to try and enlist support from their family is recognition of interpersonal influence, which is especially strong within the Hispanic culture (Pender, 2002). The empowerment approach, asking patients questions and encouraging them to problem solve, increases self-efficacy and likelihood of adopting new behaviors (Anderson, 2000).

Implementation

The classes will be taught by two nurses who travel to the clinic on a rotating basis, once a month from October-July. The patients will be triaged and will see
providers in the morning, receive refills of their medications, test strips, and lancets. Every patient will be provided a glucometer and individual instructions for use. Diabetes classes will be taught in the afternoon at the library, a short walk from the clinic. Currently there is not any space large enough at the clinic for the diabetes class. However, there are plans to enlarge the clinic and create a larger space for classes but government permission is needed. Class will begin when the last patient from the diabetes clinic receives his/her medication refills, and will last for approximately 1 ½ hrs.

Efforts are underway to identify local persons to train as Community Health Workers or Promotoras. By releasing control of teaching and support, the community becomes empowered (Lujan, 2007). Because the Promotora lives in the community, he/she is available to answer questions and provide support when the nurse educators are not present.

As noted, there is currently not a dietician available to participate in the diabetes clinic, although several have been invited. A nurse with dietary training provides the class on nutrition. One pharmacist who participates in the Flying Sams clinic was born in Mexico, City and is available to teach the class on medications. He is a clinical pharmacist who is able to answer questions and explains the concepts of glucose control related to medications.

Summary

This chapter reviews the proposed modules for diabetes education in a rural population of Mexicans with low-literacy skills. The modules cover the knowledge, skills, and behaviors necessary to successfully self-manage diabetes, as proposed by the
American Diabetes Association (Funnell, 2002). The aim of the modules is to increase the patients’ self-efficacy as described in the HPM, thus allowing patients to adopt healthier behaviors (Pender, 2002). Active participation, goal setting, problem solving, and empowerment strategies are incorporated in the modules to increase the participants’ self-efficacy (Anderson, 2000). Materials are presented in a simplified format, using pictures and models; material is reviewed each class, with ample opportunity for questions and answers; and live demonstrations are utilized; all methods found useful for persons with low-health literacy levels (Rosal, 2004).
CHAPTER FOUR

Introduction

This chapter presents suggestions for evaluation of the proposed project. The following chapter will discuss the quality indicators for diabetes self-management education (DSME) and commonly used tools to measure changes in participants who participate in these DSME projects. An evaluation of clinical, behavioral, and quality of life indicators will be sought from the participants. Satisfaction of the participants with the proposed intervention will be evaluated with a formal questionnaire, administered by translators who are not involved in teaching of the classes. Other key players will be involved in the evaluation process through a meeting of the diabetes team to evaluate the project.

The previous chapters have discussed the rising incidence of diabetes in the Hispanic population and the need for development of a culturally sensitive intervention focused on diabetes self-management education for a population in rural Mexico. This proposal includes a series of six educational modules based on concepts from the Health Promotion model specifically targeted to increase self efficacy and to promote behavior change. The empowerment approach will be utilized to engage patients in the learning process. This approach acknowledges that although patients may lack interest in diabetes as a health topic, they become engaged when the topic is related to a problem in their own life (Anderson & Funnell, 2000).
Evaluation of Results

According to a Task Force of the AADE, evaluation is an essential step in providing quality diabetes education (Mensing, 2007). The process of monitoring the participant’s participation, growth, and progress in problem solving and achieving key behaviors allows identification of best practices. According to the AADE the standards for outcomes measurement of diabetes self-management education include:

1. Behavior change, the unique outcome for DSME;
2. Diabetes self-care behaviors, which should be evaluated throughout education;
3. A continuum of outcomes, including learning, behavior, clinical documentation of health status, to show the interrelatedness of DSME and behavior change (Mensing, 2007).

Psychological Measures

A number of useful tools are available to measure the response of patients to diabetes education interventions. As indicated by the AADE, change in self-care behaviors is of primary interest for successful management of diabetes. Key behaviors identified by the AADE include: being active or exercising, healthy eating, taking medication correctly, self-monitoring blood glucose, problem solving; including high and low glucose levels and sick day care, reducing the risks of diabetic complications, and the psychosocial adaptation to living with diabetes (Mulcahy, 2003).

A tool entitled Summary of Diabetes Self-Care Activities (SDSCA) measure is a self-report method that has proven practical, cost-effective, and reliable (Toobert, Hampson, & Glasgow, 2000.) The average inter-item correlations within the scales are
high according to the authors (mean = 0.47); test-retest correlations have shown to correlate moderately well (mean=0.40). This 12-item self report instrument contains questions such as: *How many of the last seven days have you followed a healthful eating plan?* Higher scores indicate higher levels of self-management activities. The SDSCA will be administered at the first individual visit and each individual visit thereafter and utilized to measure changes in A Spanish translation tested by Vincent, McEwen, & Pasvogel (2008) will be utilized. The Spanish version has been found to be reliable and valid with a reported Cronbach’s alpha of .70. The Spanish version of the SDSCA questionnaire will be administered at the first individual visit and each individual visit thereafter and utilized to measure changes in self-care behaviors during the intervention.

A measurement of self-efficacy can be obtained through use of the Self-Efficacy for Diabetes Scale (Lorig, Ritter, & Gonzales, 2003). According to the authors, the Spanish scale had a coefficient alpha of 0.85 (n=147) and a test-retest validity of 0.80 (n=20). The purpose of this 8-item self-efficacy scale is to question patients about their confidence in ability to control fatigue, pain, emotional distress, and other symptoms brought about by diabetes and still carry out their daily activities. Responses use a 10-point scale ranging from 1 = *not at all confident* to 10 = *totally confident*. The Health Promotion model (Pender, 2002) used as a basis for this proposal suggests that persons will not put forth the effort to reach a goal if it is perceived impossible to achieve, thus motivation to change is based on prior knowledge of personal success, the success of others in achieving the goal, and personal confidence in one’s own ability. This has roots in Social Cognitive Theory (SCT) (Bandura, 1977), who proposed that the stronger a
person perceives self-efficacy, or confidence in ability to achieve a task, the more likely the person will engage and persist with the task. Both baseline self-efficacy scores and changes in self-efficacy have proven to be robust predictors of outcomes in diabetic education interventions (Lorig, Ritter, & Gonzales, 2003; Brown, 2002; Lujan, 2007; Two-Feathers, 2005, Heisler, 2007). The Self-Efficacy for Diabetes Scale, an eight item Spanish version will be used at the beginning and end of the intervention.

Knowledge about diabetes is important due to the impact it may exert on the patient’s willingness to change behavior. However, expecting patients with low literacy skills to make the connection from theoretical knowledge about a disease to practical application to their own lives may be inappropriate. Often these patients miss contextual clues and miss the implied thought because they have less developed skills in reading, analysis, and synthesis of ideas (Doak, 1996). Therefore, while the curriculum of this proposal includes traditional diabetes educational content, the modules are developed to be interactive in nature with an emphasis on behaviors and skills needed to manage diabetes rather than a series of facts. This includes an emphasis on group problem solving, demonstrations, summaries of key points, and reviews during each class of previous materials. The Diabetes Knowledge Questionnaire (DKQ-24), Spanish version (Garcia, Villagomez, Brown, Kouzekanani, & Hanis, 2001) has a reliability coefficient of 0.78, suggesting internal consistency. The authors tested both an original version with 60 questions and the 24 question version and found the versions were well correlated (r = 0.85). The DKQ-24 will be administered at the first group class and utilized as a teaching tool. It is a twenty-four item quiz, an example being: Question #1 Eating too much sugar
and other sweet foods is a cause of diabetes. With choices of: yes, no, and I don’t know. The DKQ-24 will be repeated at the last class of the year to evaluate changes.

Another measure of interest in diabetes is psychosocial distress. While the theme of stress has been associated with Hispanics who live with diabetes, few studies measure quality of life outcomes (Whittemore, 2007). The Diabetes Distress Scale (DDS) has been developed and tested at four different clinical sites and has proven good internal reliability and validity (Polonsky, et al., 2005). This 17 item questionnaire covers four domains including negative emotions, treatment problems, food-related problems, and lack of social support and correlated well with a previous 28-item scale (r = 0.99). Internal consistency of the DDS and the four subscales is adequate (Cronbach’s alpha over 0.87). Validity of the scale is proven to correlate with depressive symptomatology (r = 0.56). The patient rates each item to the degree the item is currently problematic for them on a 6-point Likert scale, from 1 (no problem) to 6 (serious problem). An example of a question follows: Feeling angry, scared, and/or depressed when I think about living with diabetes. The DDS will be administered at the beginning of Module 3, “Achieving Balance in Life” and on another individual visit prior to the end of the intervention. A Psychologist is available through the Flying Samaritan clinic program, to see patients who demonstrate a need for further intervention.

Biological Measures

Glycosylated hemoglobin (HbA1C), a core measurement of glycemic control showed only minor improvement in a survey of studies completed in Hispanic adults (Whittemore, 2007). While it is important to track this clinical outcome, expectations
should be adjusted accordingly regarding the expected improvements within the population. The HbA1C will be measured at the beginning and end of the intervention using Metrika technology, with proven laboratory accuracy of 99%. This point of care technology uses one drop of blood, is CLIA waved, and is certified by the National Glycohemoglobin Standardization Program. In addition, blood pressure will be checked with a manually operated sphygmomanometer and a stethoscope. The patient will be seated with his/her arm supported at the level of the heart. The blood pressure will be measured at each visit to the clinic, before the patient is seen by a provider.

Satisfaction of Key Players

The importance of satisfaction with the intervention cannot be underestimated. A number of key players in this intervention will be queried regarding their satisfaction with the project and any changes they would like to propose. A list of questions has been prepared for the patients to be asked during a group meeting at the end of the project by a neutral party such as a translator. The translator will take notes regarding the responses from the patients to questions such as: Are they happy with the services provided? Have they made any changes due to new information they have learned in the classes? Have they found the healthcare team supportive of their needs? What other topics would they like to be covered in classes? How can we help you? The notes taken by the translator will be reviewed in the meeting of all members of the health team, to aid in planning for future clinics.

All those on the health care team will meet and discuss the results of the diabetes clinic. What positives do they see? What negatives? What changes would team members
like to make? How can we achieve better results? Informal notes will be kept of the meeting and shared between members.

It is important to be accountable to those who donate funds for the diabetes clinic. Ongoing reports will be written for the newsletters describing activities in the diabetes clinic, explanations of how funds are being spent, and success stories will be shared. The reports will include the number of patients attending the clinics, current topics of classes, recent outcome measurements, and plans for future activities.

Summary

In review, the proposal for diabetes education within a group of Mexican adults in Baja Sur will be evaluated based on standard outcome measures. These will include behavior changes made by the participants during the intervention through use of the SCSDA measurement tool (Toobert, Hampson, & Glasgow, 2000.), Spanish version (Vincent, McEwen, & Pasvogel, 2008). The Self Efficacy for Diabetes Scale (Lorig, Ritter, & Gonzales, 2003) will be utilized to measure changes in self-efficacy. Although change in behavior is desired over increased knowledge, the (DKQ-24), Spanish version (Garcia, Villagomez, Brown, Kouzakanani, & Hanis, 2001) will be used both to test initial knowledge about diabetes and as a teaching tool. Psychosocial distress will be measured with the DDS (Polonsky, et al., 2005) and individually discussed with patients. Biological measures will include testing HbA1C, and blood pressure. The satisfaction of key players in the intervention will be addressed by various feedback mechanisms including forums, newsletters, and interdisciplinary team meetings.
CHAPTER FIVE

Introduction

This chapter presents the strengths and limitations of the proposed project. The difficulties of sustaining a project are reviewed. Caution should be used in applying results from this project to other groups of people of Hispanic background, due to the fact that this area of Baja Sur is both isolated and rural and may even differ from mainland Mexico. Some implications for practice will be considered as well as possible topics of further research.

The purpose of this proposal is to create diabetes educational modules that will be effective within a population of low literate Mexican people living in a remote fishing village in Baja California Sur. The significance of diabetes within the Hispanic population has been explored from a world view, within the United States, where we have a growing population of Hispanics, as well as in Mexico, where the diabetes burden continues to grow and threatens to exceed the resources for care.

The proposal is culturally tailored utilizing strategies found to be effective in studies completed with Hispanic populations both in the U.S. and Mexico. Pender’s model of Health Promotion (Pender, 2002) is the basis for the project using the concept of increasing self-efficacy by use of an empowerment approach (Anderson & Funnel, 2000). Pender’s model guided the development of the intervention as was used to develop strategies targeted to reduce perceived barriers and enhance perceived self-efficacy and used the strength of interpersonal influences to increase commitment. A deeper
investigation of environmental influences might include the impact of the community on
the ability of the individual to make changes.

The empowerment approach will provide the participant with resources to make
informed choices about his/her self-care, thereby becoming more actively involved in
his/her own self-management. The project will address low literacy needs by using
written materials with more graphics and active voice, as well as an interactive approach
to classes, including question/answer sessions, repeating information such as key
messages, and checking for patient understanding.

A number of outcome measures will be completed to determine the success of the
project including the SCSDA, Self- Efficacy for Diabetes Scale, DKQ-24, and the DDS,
as well as clinical measures to include HbA1C, and blood pressure.

Strengths of the Project

The project offers an educational outreach to a group of Mexican adults with type
2 diabetes with low literacy who has received very little information regarding diabetes.
During the normal clinic hours, visits with providers are rushed with an average visit
lasting between five to ten minutes. This project offers the population an opportunity to
learn about diabetes, with information that is tailored to help them make better choices
about behaviors that impact their blood sugars. The classes are offered in a non-
threatening environment, with efforts made to make the time enjoyable for the
participants through sharing of food and dance.

Cultural tailoring of the project takes into consideration the importance of the
family, increased stress within the culture for those with diabetes, and the difficulties in
modifying the Mexican diet. The love for fiestas and social time is recognized with potlucks and time reserved for dancing and interaction. The importance of speaking with each participant and asking about the family members is also a cultural strength of the project.

Limitations of the Project

The modules are designed to reflect the current “best practice” of diabetes self-management education available within the United States. While a person with an ethnocentric viewpoint might consider this a strong point of the project, because the project takes place in Mexico, I believe it adds limitations. Despite best intentions, a project designed to meet the goals of education in the U.S. may not meet the needs of these participants. This was the finding of a study done in rural Mexico when respondents emphasized that their management of diabetes depended on family needs and behaviors (Valenzuela, 2003). The authors concluded that unlike the U.S., where individuals are the key in self-management of illness, in Mexico entire families and even communities may be a more appropriate target for education. In another example of differences, while education in the U.S. might focus on learning to read food labels, this approach would not work in the small community on Baja Sur as few foods found in the tiny grocery store have food labels. Lastly, difficulty may arise in understanding the daily diet of the participants. For instance, asking the participants to keep food diaries for a day may not be helpful if the nurse is unable to recognize many of the foods written in the journal or understand the method of preparation. A community worker such as a Promotora might
shed more light on the diet of those in the village and offer suggestions regarding ways to modify the diet in a culturally acceptable manner.

This project might have limited application to other groups. It is developed with a specific group in mind, Mexicans with low literacy in a rural village in Baja Sur. This population has very limited access to medical care and has received little education about diabetes. It is important to realize that the ethnic term “Hispanic” signifies more a common language than a homogenous group of people; prior to making applications across groups, one must determine if the people truly share a similar culture.

Sustainability

A program of this magnitude will require a great deal of effort for two nurses to sustain. Classes and clinic will be held monthly for ten consecutive months, with a break in August and September. The monthly commitment requires a three day weekend as well as time to order and prepare supplies for the clinic, testing strips to distribute, educational materials, and lab testing supplies. Time is also required for documentation, meetings, and evaluation. Currently there is an effort to recruit more nurses interested in working with the diabetes project. An ongoing hope is to find persons in the community to recruit and train as Promotoras who will support the community on a continuing basis as well as reinforce the educational efforts.

Implications for Nursing Practice and Future Research

There are important implications from the review of literature, the work that has been completed with Hispanic populations and treatment of diabetes. It is clear that as nurse practitioners we have the imperative to remain abreast of the current theory
regarding education and treatment of diabetes as well as maintain a desire to learn about the cultures of the patient populations we serve. We must be cognizant of the literacy level of all of our patients and strive to practice and teach using the best resources available to maximize patient understanding and mutual communication.

Future research with the group in Baja Sur could include family and community health projects such as diabetes prevention projects in the schools, health fairs, diabetes support groups, and community exercise projects.

Summary

Chapter five reviews the proposal for six educational modules related to diabetes self-management developed for a group of Mexicans with low literacy living in a small village in Baja Sur. The significance of diabetes to the Hispanic population is discussed as well as the importance of considering a culturally tailored approach to diabetes education. The proposed modules are intended to be used in a manner that is respectful of the Mexican culture. The needs of low literacy patients are addressed in the educational materials through the use of handouts with colorful graphics, the use of repetition, and single messages. The entire approach to education is simplified for these low literate learners to reflect the new behaviors needed for successful diabetes management rather than traditional acquisition of knowledge about diabetes (Doak, 1996).

The Health Promotion Model (Pender, 2002) is the theoretical basis for the modules with an emphasis on increasing self-efficacy. The proposal utilizes empowerment strategies (Anderson & Funnell, 2000), which increase self-efficacy and
allow participants to become actively engaged in the learning process. Strengths, limitations, and sustainability of the proposal are addressed.

Implications for nurse practitioners are discussed with an emphasis on the importance of continually seeking to improve the standard of care provided in both diabetes self-management education and treatment. The impact of low literacy on patient understanding of diabetes education and the use of the latest teaching/learning methods for low literacy is vitally important in our daily practice. Future directions of research might include projects that target families and communities.
APPENDIX A:

PATIENT EDUCATION MODULES
Module 1: Individual Meetings with Patients, Introduce Concept of HbA1C

Aim of Module

This initial meeting with patients provides an opportunity to become acquainted. The nurse can share information about the program and ask questions of the patient:

**How long have you had diabetes?**

**Have you ever taken medication for diabetes?**

**Do others in your family also have diabetes?**

**Are there other family members that would like to join you in today’s activities?**

Invite other family members to come to classes to learn more about diabetes. If possible, take a picture of the patient with his/her family to add to our patient “notebook” so we can become better acquainted with all of our patients.

What are the patient’s primary concerns about diabetes, what is most difficult for the patient? Use open ended questions such as:

**What gives you the most trouble about caring for your diabetes?**

**Can you share with me what causes you the most frustration?**

**How do you feel about diabetes?**

**What can we do to help you?**

**Can we work together to make a plan to address this concern?**

**Do you have questions we can discuss in future classes?**

Check patient’s HbA1C using the Point of Care Metrika technology kit. Write down the number in the patient’s chart and on the handout for today.
The HbA1C is an average blood sugar for the past three months. It is like the report card the children bring home from school, only it is giving you a report on your blood sugar. It tells you and your doctor if your blood sugars are in good control or if you need to make changes.

If the patient is ready, encourage him/her to set a realistic short term goal related to HbA1C and write their goal on the handout and on their chart. Encourage the patient to identify barriers and strengths related to achieving their goal. What small steps could they take toward achieving their goal of a lower HbA1C?
Module 2: Principles of Healthy Eating

Aim of Module

This module introduces the basic principles of healthy eating, suggests modifications to current styles of cooking, and connects sound nutritional habits to the history of those persons who lived on the Baja in years past.

Basic nutritional strategies identified in this module include:

1. Increase in fiber, fruits, and vegetables
2. Decrease in dietary fat and sugar

Introduction:

Does anyone know about the early inhabitants of Baja Sur?

Has your family lived here for many generations or did they come here from the mainland? If so, from what area did they migrate? Does anyone know about foods eaten by the early people?

Both Baja Sur and Northern Mexico were inhabited by natives known as Cochimis and Guayeuras, known for their ability to adapt to a hostile environment. They did not practice cultivation but were fishermen (like the people of Lopez Mateos!), and gathered fruit and seeds. They learned to live in harmony with nature, had good health, and were strong and adaptable. They were never conquered by another people.

Choose pictures of food with help from the class to place on a poster, to demonstrate what the early people may have eaten. Show pictures of fish, fruit, nuts—these belong on the poster! Also show pictures of processed foods and foods from today such as hamburgers, hot dogs, Coke, ice cream, fried chicken, etc. These do not belong!
Talk a little about frying food.

**Is frying a historical way of cooking food? Does it have any health benefits?**

**What would be a better way of cooking food? How about grilling or baking?**

**Does anyone know what fried food does to our heart?**

**Is the use of refined sugar a healthy addition to our eating choices?**

**How can we limit sugar intake for our families?**

**What are some things we eat or drink that are very high in sugar?**

Show a 12 oz bottle of soda with 11 tsp of sugar and explain that this is how much sugar is in this bottle of soda. **What could we eat or drink instead of these things?** Talk about fresh fruits, water, and tea.

The final part of class will be an interactive session on meal planning.

Pass out today’s handout: The Balanced Plate and food models.

Give a brief demonstration of portion sizes; number of tortillas/day, portion of rice and beans, size of a portion of meat. Ask the class members to each find a partner and pass out paper plates. Ask each team of two to plan a breakfast, lunch or dinner using the food models and explain to the rest of the class what makes it healthy. This is intended to be an opportunity for the class to learn from each other.

The class will conclude with sharing of healthy snacks utilizing fruits, vegetables, nuts or grains. (For example, small cups of trail mix with dried fruit, nuts, and grains)
Module 3: Balance in Life

Aim of Module

This module is to help the patient achieve balance in life, to provide an opportunity for discussion of mental health issues and give examples of dealing with the daily stress of living with diabetes.

An interactive group session allows patients to see that they are not alone in dealing with issues such as stress and depression. As they explore stress and methods of coping, they will increase in self-efficacy related to skills needed for living with diabetes.

Diabetes is a chronic lifelong condition; there is no cure for it.

It affects many aspects of your life.

Some possible effects:

- The need for a regular schedule
- Changes in the way you eat
- The need to take medication every day and monitor your blood sugar
- Possible changes in your job or relationships with other people

What effect has diabetes had on your life? It can cause many difficulties can’t it?

Who needs to know that you have diabetes? Your employer? Your family?

Why?

Everyone has feelings about diabetes; these feelings can change over time. Were you angry when you first learned you had diabetes? Did you doubt it was true? Were you sad? Worried? Why did you feel that way?
(Feelings need to be acknowledged but not solved)

Your feelings and stress levels can affect your blood glucose levels and may also leave you feeling tense and tired. How do you deal with your feelings?

Sometimes it helps to write your thoughts down. Although you didn’t choose to have diabetes, you can choose how you respond to and care for it.

Most people find it helpful to have someone to talk to:

A family member, a friend, or another person with diabetes

Sometimes families want to help but they need to know what to do to help you. Have you asked your family or friends for help? What are some things you could ask your family or friends to do to help you? Examples: Take walks together, encourage healthy eating, not bring sugary food into the house, or just are available to listen.

Managing Stress

What is stress? Limiting stressful events or learning to cope with them is important for your health. What health problems are related to stress? What causes you stress in your life?

Stress makes it difficult to control blood sugar, the blood sugar may rise or it may drop in response to stress. Is it more difficult for you to cope with stress since you learned you have diabetes?

What are some ways people cope with stress? (Overeating, smoking, drinking too much alcohol, drug abuse)
What helps you cope with stress? (ask the group to brainstorm, some ideas might include exercise, dance, take a walk, talk to a friend, have a good laugh, read a good book, work in the garden, spend time in prayer) (Funnell, 2000)

Interactive Time:

Lead the class in a deep breathing exercise:

Have participants in comfortable position. Have the room quiet. Ask them to breathe in slowly through the nose for 4 counts and breathe out slowly through the nose for 8 counts.

Ask participants to close their eyes and continue to breathe deeply and slowly.

“Now relax all the muscles in your head and neck. You can feel all the tension leaving your face, neck, shoulders, arms and hands. You are limp and relaxed like a rag doll. Continue to breathe deeply. Now relax your back, abdomen, buttocks, thighs, legs, feet, and toes. You are totally relaxed. Breathe deeply in for 4 counts and out for 8 counts.”

Visual imagery exercise:

Ask participants to close their eyes and travel in their minds to a place in their lives that was beautiful and peaceful.

It can be any place where you feel happy, relaxed, and at peace.

What do you smell?

What do you hear?

What do you feel?

What do you see?
Continue relaxing for a few minutes. Let go of these images. Stretch. Open your eyes. (Funnell, 2000)
Module 4: Exercise and Good Health

Aim of Module

This module is to help patients identify the benefits of exercise in relation to good health and specifically to diabetes, to examine barriers to exercise, and to encourage exercise at the individual and family level.

What are the benefits of exercise? When you exercise, even just taking a walk every day, it lowers your blood sugar.

What are some activities your family enjoys doing together? (Looking for action oriented activities such as walking, dancing, playing ball, gardening, even walking for 30 minutes to watch grandson’s soccer practice…)

How do you feel after you take a walk, a bike ride or attend a dance?

What do you think happens to your blood sugar?

Do you think it would be good for your children and grandchildren to be more active? Would anyone in your family take a daily walk with you? Are there any friends that might walk every morning with you?

What prevents us from exercising? (Ask participants to offer suggestions for overcoming barriers that are mentioned)

Talk a little about the benefit of exercise in relation to weight, blood sugar control, and hypertension. Is there ever a time when it is not safe to exercise? (Do not exercise if blood sugar is less than 70mg/dl or over 300 mg/dl) Know the warning signs and symptoms of overexertion: increased shortness of breath, nausea or vomiting, irregular heartbeat, excessive fatigue, feeling faint or lightheaded, and pain or
pressure in the chest or arm (Funnell, 2000). Before starting a new exercise program, discuss it with your doctor.

How to get started:

Choose something you enjoy.

Start slowly; work up to more activity as you grow stronger.

If possible, exercise with a friend or member of your family.

Try to set aside the same time each day for your exercise.

Make it a habit. It takes at least 30 days to develop a new habit.

Record your progress.

Reward yourself for progress made. (Funnell, 2000)

Pass out handouts and pedometers, allow time for goal setting.
Module 5: Monitoring Your Diabetes, Blood Glucose testing

Aim of the Module

This module instructs the patients how to use a glucometer, includes a discussion of what the normal values of blood sugar should be throughout the day related to food intake, and gives a basic overview of how medications work. The emphasis will be on the importance of taking medications every day and eating meals on a regular schedule, as well as troubleshooting high or low blood sugars.

The class begins with a demonstration of the use of a glucometer and review of the handout with the normal values listed. Two additional handouts are discussed: on hyperglycemia and hypoglycemia.

If available, a clinical pharmacist, born in Mexico City will lead the portion of the class on medications and ensure that patients understand the importance of taking their medications every day. Interactive questions could include:

Is it important to take your medication at the same time every day? What if you forget a dose? Does anyone have suggestions to keep from missing medications?

If you only take one medication for diabetes, will that ever change?

What have you heard about insulin?

Does anything about insulin cause you concern?

What is the best time of day to check blood sugar? (Typically patients have been instructed to check fasting morning blood sugars. It is valuable to check the blood sugar two hours after eating to see the impact of the meal on the blood sugar and also see
if the medication is controlling this after meal rise. This helps the patient see which foods cause high blood sugars and should be eaten in smaller portions.

What can you do to treat blood sugar that is too high or too low?

How does exercise affect blood sugar?

How does drinking alcohol affect blood sugar? (Caution patient about drinking alcohol on an empty stomach, they could experience a low blood sugar. It is safer to have a drink with a meal if they wish to have a drink)

How do you think weight affects blood sugar? Will losing weight affect your blood sugar?
Module 6: Healthy Living, Taking Care of Yourself

Aim of Module

This class will discuss complications that may occur when diabetes is untreated or in poor control. This includes damage to the heart and circulatory system, the kidneys, the nervous system, and the skin.

There are three goals of sharing this information with the patient:

1. To help the patient make decisions about blood glucose goals
2. To motivate patients to do all they can to prevent complications
3. To help patients recognize early signs of problems so they can be treated and avoid more serious consequences (Funnell, 2000).

Why do some people with diabetes lose the function of their kidneys, lose their eyesight, or have the loss of a toe or a foot, while others do not suffer these problems? (The class may or may not be aware of the link between high blood sugar and complications. Explain that studies have proven good control of blood sugars will greatly decrease the risk of these complications)

Remainder of class focuses on handouts:

Handout #1 - Diabetes and High Blood Pressure

What is normal blood pressure? (Lower target for patients with diabetes, see handout) What can you do to improve your blood pressure? (Suggestions such as healthy eating, weight loss, exercise, quitting smoking, taking medications if needed)
Does your diet make a difference in your blood pressure? (Brief review of nutrition: more fresh fruits and vegetables, fiber, less refined sugar and fat. A diet low in salt is important for those with high blood pressure).

Does elevated blood pressure damage any other parts of the body besides the heart?

(Lead into discussion of the kidney)

Handout #2 - Diabetes and Kidney Disease

A summary of the causes of kidney disease and personal risk factors is summarized on the next handout. What can a person do to prevent kidney disease? (Answers might include behaviors such as good blood sugar control, healthy blood pressure, not smoking, eating a healthy diet, drinking at least 8 glasses of water each day, maintaining a healthy weight, and taking any medications prescribed by the doctor. Mention that Lisinopril is protective of the kidney; many of the patients will be taking this medication.)

Handout #3 - The Diabetic Eye

This handout has pictures that describe eye disease such as diabetic retinopathy, cataracts, and glaucoma. It includes a description of symptoms and suggestions for behaviors that will prevent or delay the onset of diabetic eye disease.

Can eye problems be prevented for a person with diabetes? (A discussion about prevention of all eye problems can emphasize that the same behaviors; good blood sugar control, healthy eating, and exercise will help prevent complications).
The clinic offers eye exams at least once every year, the diabetic patients will be encouraged to come to clinic when it is announced that the eye doctor will be there for an eye exam. There will also be visits planned from a Podiatrist and Cardiologist, the patients will be notified of the dates so they can make plans to attend clinic for these specialty visits as well. Foot care handouts will be given during the visit by the Podiatrist.
APPENDIX B:

PATIENT HANDOUTS
A1c:

El exámen de sangre que muestra los pasados 3 meses

¡Controlar el azúcar en la sangre le puede ayudar a sentirse mejor, a evitar complicaciones de su salud y hasta salvar su vida!

<table>
<thead>
<tr>
<th>A1c</th>
<th>Nivel de</th>
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<tr>
<td>12</td>
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<td>5</td>
<td>100</td>
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<td>4</td>
<td>65</td>
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¡PELIGRO!
¡CUIDADO!
¡ÉXITO!

¡LOS PELIGROS!
El azúcar alta afecta:
- Corazón
- Visión
- Riñones
- Nervios de manos y pies

El azúcar muy baja puede ocasionar:
- Mareo y Desmayo
- Hambre
- Ansiedad

Escriba sus metas en los espacios en blanco:

Para controlar el nivel de azúcar en mi sangre, para tener una vida saludable y reducir el riesgo de complicaciones en el futuro, yo prometo seguir este plan:

1. Tomar mis exámenes A1c
   A1c fecha:_____  Resultado:_____  Meta:_____
   A1c fecha:_____  Resultado:_____  Meta:_____  

2. Tomar mis medicinas
   Meta:__________________________

3. Hacer ejercicio
   Meta:__________________________

4. Comer saludable
   Meta:__________________________

5. Controlar mi peso
   Meta:__________________________


Financiado por el Programa de Diabetes del Departamento Estatal de Servicios de Salud de Texas.
Plato Balanceado

**Tamaño de una porción (por lo menos 5 al día)**
- 1 rebanada de pan
- 1 muffin pequeña
- ½ taza galletas
- ⅛ taza cereales
- 1 Tortilla
- 1 hot cake
- ⅓ taza arroz cocido
- ⅓ taza pasta

**Fruta**

**Tamaño de una porción (3-4 al día)**
- 1 fruta tamaño mediana
- ⅛ taza fruta fresca
- ⅛ taza jugo de fruta natural
- ½ taza frutas secas

**Verduras**

**Tamaño de una porción (3-4 al día)**
- ½ taza de verduras cocinadas, congeladas o enlatadas
- ½ taza de jugo vegetal
- 1 taza vegetales frescos o ensalada
- 1 papa pequeña cocida

**Pan / Almíndon / Grano**

**Carne / Proteína**

**Leche / Calcio**

**Tamaño de una porción (2-3 al día)**
- ⅛ pechuga de pollo
- ⅛ pechuga de pavo
- Pescado-tamaño de una palma
- 1 rodaja de queso
- Carne roja-tamaño de una palma
- 1 hueve
- ⅛ taza lentejas, frijoles secos
- ⅛ taza nueces, semillas
- 1 cucharada manteca de mani

**Tamaño de una porción (4-5 al día)**
- ½ taza de verduras cocinadas, congeladas o enlatadas
- ½ taza de jugo vegetal
- 1 taza vegetales frescos o ensalada
- 1 papa pequeña cocida
La Depresión y Pasos hacia Una Vida Saludable

**Haga tiempo para realizar actividades que le gusten.** Cuando está deprimido es fácil perder la motivación para hacer ciertas actividades. Trate de hacer tiempo para involucrarse en actividades, aunque sea difícil al principio.

**Coma sano – Evite la Comida Rápida** Coma gran variedad de frutas y verduras, siguiendo su plan de control personal y el control de su nivel de azúcar en la sangre. Coma despacio y con placer.

**No beba alcohol. Limite la cafeína** a una o dos bebidas al día, y beba suficiente agua (8 vasos al día). El alcohol puede hacerle sentir mejor inmediatamente, pero tiene efectos depresivos al final. La cafeína puede empeorar los efectos de ansiedad y problemas para dormir, que causa la depresión.

**Haga Ejercicio** de acuerdo a la orientación de su proveedor de salud. 20 minutos o más de ejercicio rápido diario puede ayudar a aliviar la ansiedad y el estrés.

**Pase tiempo con las personas** que tengan un impacto positivo en usted.

**Haga algo amable por alguien cada día.**

**Tenga cuidado con sus pensamientos.** El pensamiento negativo puede empeorar la depresión y hacerse un mal hábito. Cambie los malos pensamientos y preocupaciones por pensamientos positivos y realistas.

**Póngase metas simples y dé pasos pequeños.** Es fácil sentirse agobiado cuando se está deprimido. Trate de dividir las cosas en pasos pequeños. Dése mérito por cada paso que complete.
¡Manténgase activo y sientase bien!

Stay Active and Feel Better!
La actividad física es buena para toda su familia.

¿Se parecen algunas de estas situaciones a su vida?

“Me siento siempre muy cansado y sin energía.”

“Toda mi familia está aumentando de peso. Yo sé que debemos hacer algo pronto.”

“Cuando subo las escaleras al segundo piso siento que no puedo respirar.”

“Cuando mi esposo y yo estábamos recién casados íbamos a caminar todos los días y salíamos a bailar. Ahora todo lo que hacemos es sentarnos frente al televisor.”

“No tengo tiempo para hacer treinta minutos de ejercicio todos los días...pero sé que es bueno para mi salud.”

¡Manténgase activo—séntase bien!

Considere la actividad física como una solución para combatir el cansancio, el aburrimiento y el estar fuera de forma.
¡Acabe con las excusas! ¡Haga el tiempo! Nunca es tarde para decidirse a tener un corazón y un cuerpo sano. Agregue actividad física a su vida y a la de su familia.

- Tanto los niños como los adultos deben hacer cada día 30 minutos o más de actividad física moderada.
Comience agregando movimiento a su rutina diaria.

- Bájese del autobús una o dos paradas antes y camine.
- Estacione su auto lejos y camine hasta su destino.
- Suba las escaleras en vez de usar el ascensor.
- Baile al ritmo de su música favorita.

Es fácil acumular 30 minutos de actividad física al día.

- No tiene que hacer los 30 minutos de una sola vez. Puede caminar 10 minutos durante su hora de almuerzo. Puede caminar otros 10 minutos con sus hijos después del trabajo. Puede bailar al ritmo de su música favorita por 10 minutos más mientras la cena se cocina. Lo importante es que acumule los 30 minutos de actividad cada día.
- Convierta el tiempo de ejercicio en una actividad divertida y familiar. Salte cuerda, vaya a patinar o a caminar con su familia.
- Invite a algún amigo a hacer ejercicios aeróbicos.
- Comience despacio y aumente la intensidad de su actividad. Cuando menos lo piense usted va a tener la energía para hacer su actividad por 30 minutos seguidos.

Anote qué actividad va a hacer usted:
Disfrute los beneficios que la actividad física le brinda a su vida.

- fortalecer el corazón y los pulmones
- bajar de peso y controlar el apetito
- bajar la presión arterial
- bajar el nivel de colesterol
- dormir mejor
- disminuir el estrés
- tener más energía

¿Está listo para comenzar?

- Puede comenzar poco a poco a hacer ejercicios si no tiene problemas de salud.

- Si tiene algún problema de salud, consulte a su médico antes de comenzar a hacer ejercicios.
¡Haga hoy la actividad física parte de su vida familiar!
*Más vale prevenir que lamentar.*

Make physical activity a part of your family life today!
An ounce of prevention is worth a pound of cure.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
National Institutes of Health
National Heart, Lung, and Blood Institute
NIH Publication No. 96-4046
September 1996
Los niveles ideales de azúcar en la sangre
Usualmente están entre estos números:

80-120 mg/dl, cuando se despierte y antes de comer
(Upon awakening in the morning)

180 mg/dl o menos, dos horas después de comer
(180 or less 2 hrs after eating)

100-140 mg/dl, a la hora de acostarse a dormir
(Bedtime)
HIPÓGLICEMIA
(Bajo Nivel de Azúcar en la Sangre)

CAUSAS:
Muy poca comida, demasiada insulina o medicina oral de diabetes, o mucho ejercicio

COMIENZA DE REPENTE:
Puede progresar a reacción de insulina

SINTÓMATOS

TEMBLOR

PULSO ACELERADO

SUDOR

ANSIEDAD

MAREO

HAMBRE

VISION BORROSA

DEBILIDAD CANSANCIO

DOLOR DE CABEZA

IRRITABILIDAD

¿QUE PUEDE HACER?

Si usted tiene estos síntomas, beba 1/2 taza de jugo de naranja en leche descremada, o coma varias cucharaditas de azúcar.

MÍDASE EL AZÚCAR EN LA SANGRE.
Si los síntomas no han desaparecido, llame al médico.

Después de treinta minutos, si los síntomas han desaparecido, siga una comida pequeña. Mídalas el azúcar en la sangre otra vez.

Module 5 Patient Handout #2
Hiperglicemia
(Exceso de Azúcar en la Sangre)

CAUSAS:
Mucha comida, muy poca insulina, enfermedad o tensión

COMIENZA DE REPENTE:
Puede progressar a coma diabético

SINTOMAS

- Demasiada sed
- Orina con frecuencia
- Piel seca
- Hambre
- Visión borrosa
- Sueño
- Náusea

¿Qué puede hacer?

- Mida su azúcar en la sangre
- Si más de 250 mg/dL, para varias pruebas
  Llame al médico

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005-1445 Printed in U.S.A.
La Diabetes y La Presión Arterial Alta

¿Qué es la Diabetes?
La Diabetes es una enfermedad que significa tener mucho azúcar en la sangre. Cuando comemos, el cuerpo transforma la comida en azúcar para usarla como energía. Con diabetes, el cuerpo no produce suficiente o nada de insulina, una sustancia química que nos ayuda a transformar los alimentos que comemos en energía. Sin ejercicio, una dieta nutritiva saludable, y algunas veces medicamentos, la diabetes no tendrá ningún control y la comida que no se use (azúcar) se quedará en la sangre y terminará por causar complicaciones en el cuerpo.

¿Qué es la Presión Arterial Alta?

Su corazón y sus vasos sanguíneos forman su sistema circulatorio. Su corazón es un músculo que bombea la sangre a todo su cuerpo, a través de los vasos sanguíneos como venas y arterias.

Vaso no obstruido = Presión Normal
Vaso obstruido = Presión Alta

Cuando sus vasos sanguíneos, como se muestra en el dibujo de la manguera, están obstruidos por grasa y colesterol, el corazón tiene que AUMENTAR la Presión Sanguínea para mover la sangre por todo el cuerpo. **Esto causa presión arterial alta.**

Presión Arterial Alta = 140/90
Presión Arterial Buena = 130/85
Presión Arterial Muy Buena = 120/80

La Presión Arterial Alta es Peligrosa porque puede causar derrames cerebrales y ataques al corazón que amenazan su vida. Si tiene alguna señal de aviso de un ataque al corazón o derrame, obtenga atención médica inmediatamente – no lo retrasa. Un tratamiento temprano de un ataque al corazón o un derrame en la sala de emergencias de un hospital puede reducir el daño al corazón o al cerebro.

¿Tener diabetes puede afectar a mi presión arterial?

- Si tiene diabetes, usted tiene el doble de probabilidades que otra gente de tener enfermedades de corazón o un derrame cerebral.
- Usted puede reducir o prevenir el riesgo de una enfermedad de corazón o un derrame cerebral controlando las cosas básicas de la diabetes—el A1C (prueba de la glucosa en la sangre), presión arterial, y colesterol, comiendo alimentos saludables, haciendo ejercicio con regularidad, bajando de peso, dejando de fumar y tomando medicamentos (si es necesario).

Module 6 Patient Handout #1
La Diabetes y la Enfermedad de los Riñones: Lo que necesita saber

¿Qué es la enfermedad de los riñones?

Los riñones sanos filtran la sangre y los residuos/desechos del cuerpo. Los riñones también equilibran las sustancias químicas del cuerpo.

La enfermedad del riñón hace difícil para los riñones hacer su trabajo. Algunas veces incluso no se siente ningún síntoma.

Si no se trata, la enfermedad del riñón puede causar insuficiencia renal. Si esto sucede, será necesario hacer un trasplante de riñón o diálisis (esto es cuando una máquina filtra la sangre por usted porque los riñones no funcionan)

¿Estoy a riesgo de tener la enfermedad de los riñones?

- ¿Tiene diabetes?
- ¿Tiene la presión alta?
- ¿Su madre, padre, hermano, o hermana tienen alguna enfermedad de los riñones o proteína en su orina?
- ¿Le ha dicho alguna vez su doctor que tiene proteína en la orina?

Si ha respondido “Sí” al menos a Una de estas preguntas, tiene riesgo de tener enfermedad de los riñones. Pregunte a su doctor pronto si debe de hacerse un análisis de sangre u orina para revisar sus riñones.

¿Qué puedo hacer para prevenir la enfermedad de los riñones?

- Controle sus niveles de azúcar en la sangre
- Controle su presión sanguínea
- ¡No fume!
- Haga ejercicio y haga comidas sanas y equilibradas
- Beba suficiente agua, al menos 8 vasos al día
- Tome las medicinas recetadas por su doctor
- Mantenga un peso saludable
- Hable con su doctor sobre la enfermedad del riñón y las pruebas relacionadas con ella
El Ojo Diabético: Lo Que Necesitas Saber

La presión arterial y el azúcar alta en la sangre pueden dañar su visión. ¡Tenga cuidado! Muchas veces no se presentan síntomas en las primeras etapas de desarrollo de la enfermedad.

¿Qué enfermedades de la visión pueden causar la diabetes?
- Retinopatía diabética: perdida de la visión
- Cataratas: visión nublada
- Glaucoma: perdida de la visión o visión limitada en los extremos del campo visual (esquinas de los ojos)
- Hemorragia vítrea: Vasos sanguíneos débiles revientan en el interior del ojo, bloqueando la visión.

Síntomas de problemas en la visión relacionados a la Diabetes:
- Visión doble o borrosa
- Anillos, luces centelleantes o puntos ciegos
- Sensibilidad, dolor o presión en uno o ambos ojos
- Puntos ciegos en los extremos del campo visual
- Visión de color defectuosa
- Ceguera

¿Qué puedo hacer para prevenir y cuidar los problemas en la visión relacionados a la Diabetes?
- Trate la enfermedad a tiempo, antes de que cause daños irreparables como la ceguera.
- Mantenga en niveles normales el azúcar en la sangre y la presión arterial.
- Lleve un plan de manejo de la diabetes
- Haga que su doctor examine sus ojos por lo menos una vez al año aun cuando usted crea que su visión esta bien.
- Si esta embarazada y tiene diabetes, pidale a su doctor que le haga un examen de los ojos.

Recuerde: ¡A veces no se presentan ningunos síntomas!
- No espere a que los síntomas aparezcan. Hágase un examen de ojo dilatado por lo menos una vez al año.
- Cirugía láser y apropiado tratamiento pueden reducir el riesgo de ceguera en un 90 por ciento.
- Sin embargo, la cirugía láser no puede restaurar siempre la visión que ha sido perdida.

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Developed by/Elaborado por Migrant Clinicians Network, 512-327-2017
www.migrantclinician.org—Funding provided by/Financiado por Texas Department of State Health Services.
APPENDIX C:

PATIENT SATISFACTION FORM
Patient Satisfaction Form - The surveyor will ask the group the questions and make notes regarding responses and suggestions.

Questions for Discussion:

1. Are you happy with the services provided to you by the diabetes team?
2. Have you made any changes because of new information you learned?
3. Has the healthcare team been supportive of your needs?
4. What other topics would you like to have covered in classes?
5. What can we do differently to help you reach your goals?
6. What could be improved about the diabetes program?
REFERENCES


Martorell, R. (2005). Diabetes and Mexicans: Why the two are linked. Preventing Chronic Disease, 2(1), 1-5.


