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#### RELATION OF ACCULTURATION TO GLYCEMIC CONTROL AND SELF-MANAGEMENT OF DIABETES IN HISPANIC ADULTS

By

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#### A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

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#### ABSTRACT

#### THE RELATION OF ACCULTURATION TO GLYCEMIC CONTROL AND SELF-MANAGEMENT OF DIABETES IN HISPANIC ADULTS WITH TYPE 2 DIABETES

By

#### Julie Plasencia

Prevalence of type 2 diabetes in the US is high especially among Hispanic Americans. Self-management practices and acculturation in this group (Mexican orientation or Anglo orientation) may be important determinants of diabetes control. The objective of this qualitative study triangulated with descriptive quantitative data was to assess if and how self-management practices and acculturation level were related in a sample of low income, Hispanic adults with physician diagnosed type 2 diabetes, (in either acceptable or unacceptable glycemic control). This study was conducted in four steps. 1) a preliminary chart review for patient eligibility, 2) an in-depth interview, which included assessment of acculturation level, one 24-hr dietary recall and a short survey on sociodemographic and self-care behaviors, 3) a medical chart review to assess biomedical indicators, and 4) a second in-person or telephone 24 hr dietary recall. The major finding was that health and employment status were key factors related to self-management and glycemic control (11 of 17 unacceptably controlled subjects were disabled). In addition Mexican orientation favored family support and over-reliance on medication for disease management. Therefore, culturally sensitive patient-specific tailored interventions are important for enhancing efficacy of disease management.

Dedicated to my family, especially my father who lives with type 2 diabetes

and

my friends who have been my family while I've been far away from mine.

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#### **CHAPTER 1**

#### INTRODUCTION

Diabetes incidence and prevalence, especially type 2 diabetes, the predominant form of the disease, in the United States is high and rising rapidly (Centers for Disease Control and Prevention (CDC), 2004; United States Census Bureau (Census), 2004; American Diabetes Association (ADA), 2002). In 1995, the United States was ranked 3rd nation in the world for individuals with diabetes (Martorell, 2005), and in 2002, diabetes was the fifth leading cause of death in the country according to the ADA (ADA, 2002).

Hispanic-Americans and other populations of color are disproportionately affected by diabetes incidence and prevalence as well as complications of the disease. Although numerous culturally appropriate programs for Hispanic-Americans have been developed to increase awareness of the magnitude of the problem (Garcia, 2005; Brown et. al., 2005; Phillis-Tsimikas, 2004; Banister, 2004), the rates of diabetes among the Hispanic population continue to rise. One cross-sectional study analyzed the National Health and Nutrition Examination Survey (NHANES) participants from 1999-2002 and showed that Mexican-Americans were more likely to be diagnosed and treated for Type 2 diabetes, but the level of good/acceptable diabetes control was much lower in those who were being treated (10.9% in good glycemic control) compared to non-Hispanic white (55.1%) (Hertz et al., 2006). This shows that there is a need to identify some of the barriers and facilitators for achieving glycemic control, and how they are affected by mediating factors in the Hispanic population.

The paucity of data on potentially mediating factors such as acculturation<sup>1</sup>, country of ethnic origin, years of residence in the United States and cultural beliefs on this devastating disease justifies an in depth study of how these important considerations may be contributing to disease prevalence and control disparities. There have been limited studies on whether or how acculturation relates to glycemic control, but there is reason to believe it could play a role in both the etiology and control of diabetes (Caban et al., 2006; Martorell, 2005).

Untreated or poorly managed type 2 diabetes can lead to a series of complications, namely neuropathy, retinopathy and nephropathy which can lead to increased risk for infection, blindness and kidney failure respectively, and cause early mortality. The treatment recommendations for diabetes by the American Diabetes Association are based on the belief that early diagnosis, blood sugar control and related risk factors (e.g. blood lipids, weight, diet and physical activity) can reduce, delay or prevent these complications and prevent early mortality as evidenced in the Diabetes Control and Complications Trial (Ahern, 1993).

Fortunately, diabetes complications can be prevented or managed through consistent self-management practices and achievement of good glycemic control. Such practices include taking medication as prescribed, self-monitoring blood glucose via finger prick tests, exercising regularly, visiting the doctor as often as prescribed , self examination of feet, and adhering to a recommended diet (Ahern et al., 1993; Turner et al., 1998). Thus, patients with diabetes must

<sup>&</sup>lt;sup>1</sup> Acculturation is defined as the extent to which mainstream customs, beliefs, and practices are adopted by immigrants.

adopt and maintain multiple self-care behaviors to achieve and sustain good glycemic control (Ahern et al., 1993; Turner et al., 1998). Not only would improved self-management and glycemic control reduce the incidence of complications, but it would also significantly reduce costs.

The literature on type 2 diabetes also shows that diabetes control can be influenced by socioeconomic status (Himmelgreen et al., 1998) since childhood (Brown et al., 2004; Himmelgreen et al., 1998). In addition, communities may play an instrumental role in the health status of its residents through the availability of health care services, neighborhood characteristics that promote health, such as access to stores with healthy food choices and places to exercise, and attitudes toward health and health behaviors in the community (Brown et al., 2004).

An important and effective aspect of treating diabetes is providing culturally relevant self-management education tailored for the targeted population (Brown et al., 2002). Such educational interventions have been effective in promoting improved metabolic control and a greater or improved understanding of the disease in Mexican-Americans with diabetes (Brown et al., 2005). When a group of 256 Mexican-American adults with diabetes were provided with culturally relevant diabetes education, HbA1C (glycemic control) levels improved by 1.4 percentage points (Brown et al., 2002). Findings demonstrated the need for and importance of diabetes education programs that are culturally specific for this population. However, the parameters on which to focus these programs and

enhance success might differ. Hence, the degree of acculturation may be a significant factor for consideration.

An important risk factor for diet related disease is dietary quality. Researchers in San Antonio, Texas demonstrated that higher acculturation towards mainstream culture decreased the risk for diabetes and obesity (Hazuda et al., 1988). However, research surrounding diet quality and acculturation has shown that as the acculturation of Hispanics in the United States increases, diet quality decreases (Aldrich et al., 2000; Neuhouser et al., 2004; Romero-Gwynn et al., 2000). Acculturation is especially important when one considers the role of dietary recommendation adherence, an integral aspect of self-management. Research has therefore resulted in somewhat contradictory findings regarding whether or not acculturation is an indicator of risk for developing diabetes and diet-related management of the disease.

In diet-acculturation relationship studies from California (Romero-Gwyn et., 1997), Washington State (Neuhouser et al., 2004), Massachusetts (Romero-Gwynn et al., 2000), and Connecticut (Himmelgreen et al., 1998) showed that diet quality decreased as acculturation increased. In addition, findings from these studies showed that Body Mass Index (BMI), a well accepted indicator of poor dietary practices and overweight was positively correlated with acculturation in a community sample (Romero-Gwynn et al., 2000). Similarly in Monterey County, California acculturation was linked not only to poor dietary behavior, but low levels of exercise as well (Hubert et al., 2005). Potential explanations to

these conflicting findings might be due to different definitions for acculturation and/or differences in geographic locations where the studies were conducted.

In an essay published by the CDC, Martorell (2005) explains that there is a transition in nutrition when economic development and urbanization occurs (Caban et al., 2006; Martorell, 2005). Socio economic status (SES) is important to consider because it might relate to achieving treatment and management goals, via limited financial and time resources, as well as health care knowledge. In the United States, people of Hispanic descent can acculturate to their environment and attain "increased food security, increased availability of cheap sources of fat in the form of vegetable oils, more eating away from home, less arduous modern jobs, and increased in sedentary recreation" (Martorell, 2005).

Availability of health insurance, food security, cheap sources of fat and refined sugars, eating away from home, sedentary behavior and white-collar jobs have all been associated with the prevalence of obesity and diabetes (Martorell, 2005). In addition, education status, duration of diabetes and social support are important considerations in disease management. In a sub-study of the San Antonio Heart study, higher education levels were associated with improved blood pressure in women, but not for men (Hazuda et al., 1988). Other potentially related factors to glycemic control are years of schooling and access to health care.

Most research has focused on acculturation and diet, not on acculturation as it relates to self-management of diseases such as type 2 diabetes. This discrepancy is evident in the body of research surrounding acculturation, diet and

disease, but somewhat surprising given the importance placed on reducing health disparities. By studying how acculturation can affect the dietary, physical activity, and other self-management behavior components important for diabetes prevention and control, we move one step closer to understanding the connection between acculturation and diabetes. Therefore, a primary interest in this study was acculturation as a mediating factor for diabetes self-management and hence control in adults of Hispanic descent.

This proposed study in low-income Hispanic adults in Michigan explored if and how acculturation relates to glycemic control and self-management of diabetes. The goal was to determine in a sample of low income, Hispanic adults with physician diagnosed Type 2 diabetes, either acceptably or unacceptably controlled<sup>2</sup>, the extent to which acculturation and associative factors influence diabetes self-management practices recommended in a position statement published by the ADA in 2006: physical activity, eating behaviors, weight control, medication adherence, self-monitoring blood glucose, and medical monitoring (visiting with the doctor and ophthalmologist once per year). Of specific interest, were barriers and facilitators to achieving these recommended behaviors.

#### **Specific Research Objectives**

1) To describe and contrast self-management behaviors in Hispanic adults with physician diagnosed type 2 diabetes and who are either in acceptable (HbA1c < 8) or unacceptable glycemic control (HbA1c  $\geq$  8).

<sup>&</sup>lt;sup>2</sup> Acceptable Control =HbA1c<8%, unacceptable control= HbA1c ≥8%

2) To determine if and how acculturation is related to self-management behaviors and diabetes control in Hispanic adults with physician diagnosed type 2 diabetes and who are either in acceptable (HbA1c < 8) or unacceptable glycemic control (HbA1c  $\ge$  8).

The current study is the first to qualitatively provide an in-depth understanding of the role of acculturation in facilitating or hindering selfmanagement and control in Hispanic adults with type 2 diabetes. This information is critical for the development of culturally appropriate interventions, and designing tools for treating people of Hispanic descent (Bowie et al., 2007; Brown et al., 2005; Mauldon et al., 2006).

#### **CHAPTER 2**

#### **REVIEW OF LITERATURE**

The literature review includes a description of diabetes mellitus and Type 2 diabetes in Hispanic adults. A general description of epidemiology, diagnosis, associated factors, treatment and diabetes control is discussed. Finally, sociodemographic factors, self-care behaviors and acculturation as they relate to diabetes control are reviewed.

#### 2.1 Diabetes Mellitus

Diabetes mellitus is a disorder of glucose metabolism in which abnormally high levels of blood glucose result from defects in insulin production, insulin action, or both. Complications of diabetes can lead to serious consequences that are costly to manage and ultimately lead to premature death. Fortunately, there are steps that can be taken in order to control the disease and lower the risks of complications. There are two distinct types of diabetes mellitus: insulindependent more widely recognized as Type 1 and non-insulin-dependent diabetes, typically referred to as Type 2 diabetes.

Type 1 diabetes develops when the body's immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin that regulates blood glucose. This form of diabetes usually strikes children and young adults, although disease onset can occur at any age. According to the Centers for Disease Control and Prevention (CDC), Type 1 diabetes may account for 5% to 10% of all diagnosed cases of diabetes (CDC, 2007). Risk

factors for type 1 diabetes may include autoimmune, genetic, and environmental factors (CDC, 2007).

Type 2 diabetes usually begins as insulin resistance, a disorder in which the cells do not use insulin properly, and may account for about 90% to 95% of all diagnosed cases of diabetes (CDC, 2007). As the need for insulin rises, the pancreas gradually loses its ability to produce insulin. Type 2 diabetes is associated with older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity, and race/ethnicity. Type 2 diabetes has increasingly been diagnosed in children and adolescents with cases recently detected in children as young as 6 years (CDC, 2007; Kaufman, 2005; Lee et al., 2006; Liese et al., 2006; Pinhas-Hamiel et al., 2005). Type 2 diabetes has been referred to as a national epidemic in the United States, representing 90-95% of all newly diagnosed cases of diabetes (CDC, 2007).

The prevalence of diabetes in the adult population (type 1 or 2) was 6.2% nationwide (Adler et al., 2003). According to data obtained from the National Health and Nutrition Examination Survey (NHANES) from 1999-2000, crude prevalence among US adults was 6.5%, 5.6% in non-Hispanic whites, 10% in non-Hispanic blacks and 6.5% in Mexican Americans. Prevalence rose with age in all populations reaching 15.8% at >65 years of age, and age and sex standardized prevalence of diagnosed diabetes 10.4% among Mexican Americans (Cowie et al., 2006). In 2005, 20.8 million people in the United States had diabetes, that is 7% of the population and 6.2 million people were still

undiagnosed. Of people age 60 years and older, 20.9% have diabetes, which totals 10.3 million people in that age group. The incidence of diabetes continues to rise, with 1.5 million new cases of people diagnosed with diabetes in 2005 (CDC, 2007).

When undiagnosed and/ or left untreated or poorly controlled, diabetes causes life threatening complications that typically occur within 10-20 years from the time of disease onset (Adler et al., 2003). Complications arising from undiagnosed or poorly controlled diabetes significantly impacts morbidity and mortality through micro and macrovascular aberrations such as cardiovascular disease, nephropathy, neuropathy, and retinopathy (CDC, 2007). Diabetes is one of the leading causes of blindness, renal failure, peripheral nerve damage, cardiovascular disease, stroke and non-traumatic amputation of lower limbs in the United States (Adler et al., 2003; Ahern et al., 1993; Turner et al., 1998).

The identification of risk factors and "pre-identifiers" for type 2 diabetes, which have been clearly defined from a clinical standpoint, are key in recognizing individual and family risk. These risk factors are summarized in **Table 2.1**. Treatment and outcomes are based on expert opinion. Screening for type 2 diabetes in asymptomatic individuals should be considered by health care providers at 3-year intervals beginning at age 45, particularly in those with BMI  $\geq$ 25 kg/m<sup>2</sup> (Murata et al., 2003) Testing should be considered at a younger age or be carried out more frequently in individuals who are overweight and have one or more of the other risk factors shown in table 2.1 (Murata et al., 2003)

## Table 2.1 Risk factors for Type 2 Diabetes.List of Risk Factors

Family History of diabetes (i.e., parents or siblings with diabetes)

Obesity (i.e.,  $\geq$ 20% over desired body weight or BMI  $\geq$ 27 kg/m<sup>2</sup>)

Habitual physical inactivity

Race/ethnicity (e.g., African American, Hispanic-American, Native American,

Asian-American, and Pacific Islander)

Previously identified Impaired Glucose Tolerance (IGT) or Impaired Fasting Glucose (IFG)

Hypertension (≥ 140/90 mmHg in adults)

HDL cholesterol  $\leq$  35mg/dl (0.90 mmol/L) and/or a triglyceride levels  $\geq$ 250 mg/dl (2.82 mmol/L)

History of Gestational Diabetes Mellitus or delivery of a baby weighing > 9 lbs

Polycystic ovary syndrome

#### 2.2 Treatment and Control of Type 2 Diabetes

According to the Nutrition Recommendations and Interventions for Diabetes published in 2006, interventions, which include guidelines for selfmanagement of diabetes, should be tailored to target each stage of the disease: preventing diabetes (primary prevention), controlling diabetes (secondary prevention) and treating and controlling diabetes complications (tertiary prevention) (Armstrong, 2006). Self-care/self management is critical for achieving good control.

#### 2.2.1 Glycemic Control

Glycosylated hemoglobin (GHB) is the glycosylated form of hemoglobin A, (hemoglobin A1c) which constitutes 90-95% of adult hemoglobin and that of infants older than six months (Torre et al., 1981). GHB is considered the best indictor of a patient's average glycemic control over the prior 120 day period (Blanc et al., 1981; Gabbay, 1982; Lenzi et al., 1987; Torre et al., 1981). The American Diabetes Association defines normal glycemic control as hemoglobin A1c (HbA1c)= 4-6%; goal for HbA1c is < 7%, and additional action is required if HbA1c > 8% (ADA, 2006). This value should reflect little to no change in blood glucose and hence maintain near non-diabetes levels as possible in a well controlled individual. Researchers have shown significant correlations between this measure and that of values for other indices of glycemic control such as fasting blood sugar (Gabbay, 1982; Rao et al., 1986).

#### 2.3 Type 2 Diabetes in Hispanic Adults

Diabetes and other obesity-related diseases disproportionately affect Hispanic adults and other populations of color in the U.S. The following section discusses epidemiology and costs of diabetes for U.S. adults with specific facts that pertain to Hispanic adults in the U.S.

#### 2.3.1 Epidemiology

The prevalence of diabetes in the US is especially high in minority populations and indeed in persons of Hispanic descent (ADA, 2002; CDC, 2007). From 1997 to 2004, diabetes incidence increased 34% in the Hispanic population (from 7.4 to 9.9 per 1000 population) (CDC, 2007). It is predicted that nearly <sup>1</sup>/<sub>2</sub>

of Hispanic children born in the year 2000 are likely to develop diabetes in their lifetime. If the disease is not identified early or managed adequately, health related problems in this population will concomitantly increase significantly because according to the US Census Bureau, the Hispanic population continues to grow rapidly and age (Narayan et al., 2003). Persons of Hispanic descent are the fastest growing minority group in the country. However, they also have the lowest rates of insurance. Without access to proper health care or the ability to pay for it, diabetes can progress and lead to a number of health problems which are expensive to treat (Raza, 2007).

#### 2.3.2 Diabetes Cost

The direct and indirect costs of treating the disease and associated complications is high. According to the American Diabetes Association the cost of diabetes will rise from \$132 billion in 2002 to \$192 billion by the year 2020 (Hogan et al., 2003). The alarming costs of type 2 diabetes were shown in one study that looked at a random sample of 1,364 subjects with type 2 diabetes, who were members of a Michigan maintenance organization. They showed the annual medical costs of diabetes for white men (\$1700) and women (\$2000) among individuals who were controlling their type 2 diabetes with diet, and who had a BMI of 30 kg/m<sup>2</sup> and no microvascular, neuropathic, or cardiovascular complications, and respectively (Brandle et al., 2003). This same study showed that additional costs for a white male can rise up to \$10,500 annually if his BMI was 38 kg/m<sup>2</sup>, and he was using insulin therapy, on high blood pressure medication, had a history of myocardial infarction, was suffering form

microalbuminuria, and had peripheral vascular disease (Brandle et al., 2003). Even more alarming is the cost for a white male with the same conditions previously described, but with end stage renal disease; \$57,200 annually (Brandle et al., 2003).

In one study, Mexican-Americans in the National Health and Nutrition Examination Survey (NHANES) from 1999-2002, were compared with non-Hispanic white adult populations with respect to prevalence, awareness, treatment and control of hypertension, dyslipidemia and type 2 diabetes (Hertz et al., 2006). Findings indicated that Mexican-Americans were more likely to be diagnosed and pharmacologically treated for their type 2 diabetes, but were more poorly controlled (only 28.2% of those being treated had an HbA1c <7%) than the non-Hispanic whites with type 2 diabetes (51.9% of those treated had a HBA1c <7%) (Hertz et al., 2006).

#### 2.4 Factors Influencing Diabetes Control

Although diabetes prevalence is high among Hispanic persons in the U.S., there are many individual, lifestyle and environmental factors that play a role in progress and incidence of chronic diseases, and should be considered when addressing patient education for chronic diseases such as diabetes.

#### 2.4.1 Individual Factors

Some factors associated with diabetes self-management are those that are specific to each individual person. These include acculturation, years of schooling, duration of diabetes and diabetes knowledge. Each of these

components interacts with environmental and behavior factors that ultimately affect glycemic control.

#### 2.4.1.1 Acculturation

In the Hispanic population, there is a huge variation in length of exposure to and assumption of US or mainstream cultural norms. An important consideration therefore in the Hispanic and any other immigrant population, is the extent to which acculturation might play a role in disease prevalence and/ or control. There have been limited studies on whether or how acculturation relates to glycemic control, but there is reason to believe it could play a role in both the etiology and control of diabetes (Martorell, 2005).

In an essay published by the CDC in 2005, Martorell explains that there is a transition in nutritional behavior, when economic development and urbanization occurs. In the United States, Hispanics can acculturate to their environment and attain "increased food security, increased availability of cheap sources of fat in the form of vegetable oils, more eating away from home, less arduous modern jobs, and an increase in sedentary recreation" (Martorell, 2005). In another paper published in Epidemiology Review, the authors stated that type 2 diabetes can be influenced by SES since childhood, and in addition communities may play an instrumental role in the health status of its residents through the availability of health care services, neighborhood characteristics that promote health, such as access to stores with healthy food choices and places to exercise, and attitudes toward health and health behaviors in those communities (Brown et al., 2004).

There is a need for further research on the relation of acculturation to glycemic control in high-risk populations of limited income, in particular Hispanics

with Type 2 diabetes. Potential explanations to these conflicting findings might be due to different definitions for acculturation and/or differences in geographic locations where the studies were conducted.

The bidimensional model of acculturation is more commonly used in research studies involving ethnic populations. After comparing the unidimensional scales (Suinn-Lew Asian Self-Identity Acculturation) and the bidimensional model (Vancouver Index of Acculturation, in context of personality, self identity and adjustment), in 2000, Ryder et al. concluded that the bidimensional model constitutes a broader more valid framework for understanding acculturation. The bidimensional model also states that acculturation can be more completely understood when heritage and mainstream culture identities are seen relatively independent of each other (Ryder et al., 2000). The original Acculturation Rating Scale for Mexican American scale was uni-dimensional and has since been revised to a bidimensional approach for assessing the acculturation processes (Cuellar et al., 1995). The ARSMA-II-Scale, developed by Israel Cuellar was validated with a population of Mexican American youth and adults. Although the name implies that this instrument is used for Mexican Americans, it has been adapted for use with other Latino subgroups (Solis et al., 1990). The ARSMA-II measures cultural orientation of Mexican and non-Hispanic white cultures independently rather than on one scale which forces a person to lean on one culture more than the other (Cuellar et al., 1995).

An important risk factor for diet-related disease is dietary quality. In this instance, it is a component of self-management of diabetes and has a relation to level of acculturation. Interestingly, research surrounding diet quality and acculturation has shown that as the acculturation of Hispanics in the United States increases, diet quality decreases (Aldrich et al., 2000; Neuhouser et al., 2004; Romero-gwynn et al., 2000). Most research has focused on acculturation and diet, not on acculturation as it relates to disease self management like diabetes. This discrepancy is evident in the body of research surrounding acculturation, diet and disease, but somewhat surprising given the importance placed on reducing health disparities.

Research has resulted in somewhat contradictory findings regarding whether or not acculturation is an indicator for diet-related management of diabetes. Research in San Antonio, Texas has shown that higher acculturation towards mainstream culture decreased the risk for diabetes and obesity (Hazuda et al., 1988; Hazuda et al., 1991). But in diet-acculturation relationships studies done in California (Romero-Gwynn et al., 1997), Washington State (Neuhouser et al., 2004), Massachusetts (Romero-Gwynn et al., 2000), Connecticut (Himmelgreen et al., 1998) and others, diet quality decreased as acculturation increased. For example, higher acculturation was the strongest correlate of obesity, measured by BMI, in a community sample in Monterey County, California (P < 0.001), followed by less exercise and poorer diet (P < 0.05) (Hubert et al., 2005). In 2000, Aldrich et al. found that although Spanishspeaking Hispanics knew less than other demographic groups about nutrients in

foods and diet-disease connections, Hispanics generally attached more importance to having a healthful diet than did English-speaking Hispanics and non-Hispanic whites (Aldrich et al., 2000). In another study, it was found that Mexican Americans had higher rates of leisure time physical activity (Cantero et al., 1999; Lara et al., 2005). High levels of acculturation, based on a bidimensional scale, among Latinos is associated with increased rate of cancer, infant mortality, and other indicators of poor physical and mental health (Abraido-Lanza et al., 2006). This suggests that Latinos may be exposed to different risk factors or may adopt unhealthy behaviors that result in shifts in morbidity and mortality for various diseases.

#### 2.4.1.2 Years of Schooling

Diabetes control has been positively influenced by years of schooling according to various studies (Maty, et al., 2005; Paz et al., 2006; Rothman et al., 2005; Sousa et al., 2004). The Los Angeles Latino Eye Study showed that those who had less than a high school education were more likely to be poorly controlled compared to those who did have a high school education (odds ratio= 1.5; 95% confidence interval, 1.1–2.2) (Paz et al., 2006). In the Alameda County Study, 6,147 adults were followed over 34 years. It was found that socioeconomic disadvantage, especially with low educational attainment, was a significant predictor of incidence of Type 2 diabetes, and those respondents with less than 2 years of education had 50% excess risk compared with those with more education (Maty et al., 2005). A study that validated the Spoken Knowledge in Low Literacy in Diabetes scale (SKILLD) for patients with type 2 diabetes found that higher performance on the SKILLD test was significantly

correlated with higher education level (r = 0.36), and when dichotomized, patients with low SKILLD scores (< or = 50%) had significantly higher HbA1C values (11.2% vs. 10.3%, P < .01) (Rothman et al., 2005). In a study that was aimed to examine the relationship between self-efficacy and various diabetes self-management factors in a convenient sample of 141 insulin-requiring individuals with diabetes, it was found that diabetes knowledge was highly correlated with level of education (p < .01) (Sousa et al., 2004). In a sub study of the San Antonio Heart Study, higher education levels were associated with improved blood pressure in women, but not for men (Hazuda et al., 1988).

#### 2.4.1.3 Duration of Diabetes

Duration of diabetes is often positively associated with poorly controlled type 2 diabetes. In a longitudinal study where observational data was collected on 573 patients of diverse ethnicity with type 2 diabetes from Project Dulce, a program in San Diego County designed to care for an under-served population with diabetes, it was found that duration of diabetes resulted in higher mean HbA1c values (Benoit et al., 2005). In another study of 393 patients with type 2 diabetes in the Michigan Diabetes in Communities II Study, a longer time since diagnosis (OR for each 5 years duration = 1.28; 95% CI 1.07-1.53) corresponded to the increased likelihood of poor control (Blaum et al., 1997).

#### 2.4.1.4 Diabetes Knowledge

While knowledge about a disease does not necessarily result in better self-care, it is considered a potentially important adjunct to behavior change. For example, a clearer understanding of the disease progress and implications might serve as a motivating factor to institute life changing or saving practices. In a

convenient sample of 141 insulin-requiring individuals with diabetes, knowledge in younger individuals was found to be higher than older individuals possibly because older individuals might not have received the same depth of information when diagnosed compared to younger individuals (Sousa et al., 2004). Older individuals however, had significantly better diabetes self-care management, suggesting that over time, they may have developed greater self-care management skills (Sousa et al., 2004).

#### 2.4.2 Diabetes Management-Related Factors

Behavioral or lifestyle factors that contribute to diabetes control include adherence to self-management recommendations, barriers and facilitators to following these recommendations, diabetes education and the ability of the health care provider to measure adherence to recommendations.

#### 2.4.2.1 Diabetes Self-management

Recommendations of the American Diabetes Association include physical activity, healthy eating behaviors, weight control, adherence to medication prescription, self-monitoring blood glucose and medical monitoring (visiting with physician and ophthalmologist once per year) and are discussed below.

#### 2.4.2.1.1 Physical Activity Behaviors

Overall 31% of individuals with type 2 diabetes in the U.S. population report no regular physical activity and 38% report less than recommended levels of physical activity (Nelson et al., 2002). Mexican Americans as well as women, persons age 65 and older, African Americans and those using insulin to treat their diabetes were more likely to report engaging in insufficient physical activity

(Nelson et al., 2002). Those who had an income below the poverty level and less than a high school education were also more likely to engage in insufficient physical activity (Nelson et al., 2002). Hispanics in the NHANES III reported generally being less active than whites; women were generally less active than men; and individuals with lower incomes and less education were less active than more educated whites with higher incomes (Wood, 2004).

Four out of ten Hispanics in NHANES III did not engage in any leisure time activity in the month preceding data collection (Wood, 2004). Women comprised 70% of those doing no physical activity and 45.5% of total females in the research population (Wood, 2004). Of those who were physically active, gardening (31.8%) and walking (30%) were the most preferred activities (Wood, 2004). Walking was also the preferred leisure time physical activity preferred by the youngest group 17-25 year olds (Wood, 2004). Men were also more likely to engage in physical activity as part of their occupation and women as a whole were less likely to work outside the home (Wood, 2004). Those women who did not engage in household activity or childcare were less likely to be physically active (Wood, 2004). Forty-four percent of individuals who required oral medication or insulin to treat diabetes, did not engage in any leisure time physical activity (Wood, 2004).

Boekner et. al. found that a convenience sample of 75 Hispanic women were meeting the recommended amount (150 min/wk) of physical activity at 372 min/wk (±788 standard deviation) (Boeckner et al., 2006). Community based interventions aimed at Hispanics have demonstrated a significant increase in

moderate to vigorous walking among participants (Staten et al., 2005). These participants of a 12-week program who had an 87% completion rate, showed that the average minutes per week at the beginning of the program, fast walking time increased significantly increased (p=0.002) from 77.5 ( $\pm$ 204.5 standard deviation) to 108.9 ( $\pm$ 160) minutes per week (Staten et al., 2005). Moderate walking also significantly increased (*p*<0.001) from 73.7 ( $\pm$ 204.5) to 138.1 ( $\pm$ 145.4) minutes per week (Staten et al., 2005).

Results from the Diabetes Control and Complications Trial (DCCT) demonstrated that a reduction of at least 7% body weight through a healthy diet and physical activity of moderate intensity of 150 minutes/week reduced the incidence of type 2 diabetes by 58% compared to the placebo group (Ahern, 1993). Therefore, physical activity is an important adjunct to disease treatment and management.

#### 2.4.2.1.2 Eating Behaviors

The American Diabetes Association (ADA) proposed nutrition and medical nutrition therapy interventions for diabetes in 2006 based on primary and secondary prevention to prevent complications, and tertiary prevention to prevent morbidity and mortality (Bantle et al., 2006). For persons with type 2 diabetes, medical nutrition therapy and eating behaviors are clearly important integral to diabetes management from a secondary perspective, **Table 2.2**. As outlined by ADA, the overall recommendations are summarized in **Table 2.3** (For complete recommendations see **Appendix A**).

### **Table 2.2** Major nutrition recommendations and interventions-secondary prevention (ADA, 2006).

#### List of Nutrition Recommendations

A dietary pattern that includes carbohydrate from fruits, vegetables, whole grains, legumes and low fat milk is encouraged for good health

The cardiovascular risk of individuals is considered to be equivalent to that of a non-diabetic individual with pre-existing CVD. Therefore, in individuals with diabetes, limit saturated fat to < 7% of total calories.

For individuals with diabetes and normal renal function, there is sufficient evidence to suggest that usual protein intake (15-20% of energy) should be modified.

If adults with diabetes choose to use alcohol, daily intake should be limited to a moderate amount (one drink per day or less for women and two drinks per day or less for men.)

There is no clear evidence of benefit from vitamin or mineral supplementation in people with diabetes (compared with the general population) who do not have underlying deficiencies.

Individuals with type 2 diabetes are encouraged to implement lifestyle modifications that reduce intakes of energy, saturated and *trans* fatty acids, cholesterol, and sodium and to increase physical activity in an effort to improve glycemia, dyslipidemia, and blood pressure.

Nutrient	Recommendation
Amount & type of carbohydrate	130g/day, low-carbohydrate diets, restricting total carbohydrates to < 130g/day, are not recommended in the management of diabetes
Fiber	≥ 5g fiber/serving, or ~50g fiber/day
Sweeteners	Reduced calorie/non-nutritive sweeteners approved by FDA
Dietary fat and Cholesterol	< 7% total calories from saturated fats < 200 mg/day dietary cholesterol <u>+</u> 2 servings of fish per week
Protein	15-20% of total energy
Alcohol	1 or 2 per day daily intake, less for women
Specific for type 2 diabetes	Reduce intakes of: Energy Saturated and <i>trans</i> fatty acids Cholesterol Sodium Increase physical activity

### **Table 2.3** Summary of Nutrition Recommendations 2006, American Diabetes Association.

Key eating behaviors for US adults overall and in the Hispanic population, with or without diabetes, relate to intakes of fat, fruits and vegetables and to total calories. Among 1,480 adults with a self-reported diagnosis of type 2 diabetes in the Third National Health and Nutrition Examination Survey (NHANES III), 82% reported that 30-40% of daily calories came from fat and 26% reported that more than 40% of daily calories came from fat compared to a recommended intake of <30% of daily calories from fat (Nelson et al., 2002). The American Diabetes Association recommends <7% total calories from saturated fats and <200 mg/day dietary cholesterol for persons with type 2 diabetes. These recommendations are based on previous research that found that the cardiovascular risk of individuals with type 2 diabetes but did have pre-existing cardiovascular disease (Bantle et al., 2006).

In the same sample from the NHANES III survey, 62% of individuals ate less than 5 servings of fruits and vegetables per day and 61% reported consuming more than 10% of daily calories from saturated fats (Nelson et al., 2002). Higher consumption of fruits and vegetables and diets lower in fat were more common among individuals who were over 65 years of age and Mexican Americans (Nelson et al., 2002). In a community based prevention program targeted at Hispanic adults, they were able to significantly increase (p<0.001) the amounts of fruits and vegetables consumed per week from 14.2 ( $\pm$ 9.7 standard deviation) to 19.6 ( $\pm$ 11.8) for both fruits and vegetables (Staten et al., 2005). According to the American Diabetes Association, recommended amounts of

carbohydrates (130g/day) should come from fruits, vegetables, whole grains, legumes and low fat milk (Bantle et al., 2006).

#### 2.4.2.1.3 Weight Control

The increased risk for Type 2 diabetes is attributable to obesity by as much as 75% (Manson et al., 1994). Excess body fat is the most notable modifiable risk factor for the development of type 2 diabetes (Edelstein et al., 1997). Weight loss is believed to improve glycemic control by decreasing insulin requirements and increasing insulin sensitivity, thereby decreasing overall morbidity and mortality (Hansen, 1988; Norris et al., 2005; Wing, 1995; Wing et al., 1987). The benefit of weight loss in adults with type 2 diabetes has been demonstrated even when weight loss is modest (Wing, 1995; Wing et al., 1987). Given the strong link between energy balance (food intake versus energy expenditures via physical activity), obesity and other chronic diseases, the American Diabetes Association recommended that individuals with type 2 diabetes who are overweight (BMI >25 kg/m<sup>2</sup>) or obese (BMI >30 kg/m<sup>2</sup>) should be participating in regular physical activity or other lifestyle changes to achieve this objective (Bantle et al., 2006). Effective approaches to weight loss or maintenance should be considered for each individual patient's needs and other conditions that may facilitate or hinder their ability to achieve their goals for weight loss or maintenance.

#### 2.4.2.1.4 Medication Adherence

Chronic diseases such as diabetes mellitus in conjunction with others such as hypertension, coronary heart disease and arthritis require multiple medication regimens. Patients may inadvertently forget to take medication or
medication contrary to that prescribed. Some factors that influence adherence are comprehension of treatment regimen, perception of benefits, side effects, medication costs and regimen complexity (Rubin, 2005). In a multinational survey of patients with type 2 diabetes an their physicians, 57% of physicians responded either "always" or "often" when asked how often they told patients they will have to start insulin if they do not follow medical advice (Geelhoed-Duijvestijn PHLM, 2003). Patients surveyed had negative attitudes towards beginning an insulin therapy because they associated the insulin therapy with failure to comply with medical advice from their physician (Peyrot, 2003).

In a study by Peyrot et al. (2003), researchers found that almost 70% of physicians reported that stress and depression was affecting the type 2 diabetes patient's ability to adhere to treatment and recommendations. Depression associated with diabetes-related emotional distress requires treatment because of the impact on treatment adherence and glycemic control outcome (Rubin, 2005). Treatment of depression or stress has been associated with improved metabolic outcomes (Lustman et al., 2000; Lustman et al., 1997; Lustman et al., 1998).

#### 2.4.2.1.5 Self-monitoring Blood Glucose

One self-management behavior that has been shown to improve glycemic control in individuals with type 2 diabetes is self-monitoring blood glucose (Rubin et al., 1989). Self-monitoring blood glucose involves a finger prick blood test measures the glucose levels in the blood so that the patient has a way of monitoring their blood glucose daily. A study that looked at GHB and compared those subjects who were performing self-monitoring blood glucose to those who

were not showed a better GHB level for those who did monitor their blood glucose (Holmes et al., 2002). Another study looked at various self-care behaviors including self-monitoring blood glucose. The researchers found that frequency of self-monitoring blood glucose and corresponded to a decrease in GHB (Rost et al., 1990). Self-monitoring blood glucose has been established as a diabetes self-management behavior that is positively associated with glycemic control (Holmes et al., 2002; Rost et al., 1990; Rubin et al., 1989). In a sample from NHANES-III, researchers found that persons of Hispanic ethnicity and had a language barrier were less likely to practice self-monitoring blood glucose at home and it was less common among Mexican-Americans (Harris, 2001; Harris et al., 1999). One diabetes education program, Translating Research into Action for Diabetes (TRIAD), created for Spanish speaking Hispanic persons reported that Hispanic individuals were less likely to perform self-monitoring blood glucose tests (36.8%) compared to non-Hispanic whites (49.1%) (Brown et al., 2003).

#### 2.4.2.1.6 Medical Monitoring

Medical monitoring is an important factor that persons who live with type 2 diabetes should try to follow. American Diabetes Association recommends that persons with type 2 diabetes visit with an ophthalmologist for retinopathy screening once per year and visit a physician regularly for professional monitoring of disease progress and make changes as needed (ADA, 2006)

#### 2.4.2.2 Diabetes Self-management Strategies

Many self-management strategies might not be appropriate for the most common causes of the symptoms. There appears to be a focus on alleviating

discomfort associated with symptoms without dealing with the cause of the symptom (Garcia, 2005). In previous studies, people with diabetes identified the same symptoms with both hyper and hypoglycemia and people with diabetes may feel symptoms of hypoglycemia when their blood sugar is still abnormally high because of a physiologic adaptation to high levels of circulating glucose and a higher sensitivity to decreases in level of blood glucose (Brown et al., 1998). Cultural considerations may be associated with individuals with diabetes ignoring discomforts or other sensations that distract from family and work obligations, and hence symptom prevention and treatment among Mexican Americans with type 2 diabetes (Garcia, 2005).

"Tomando Control de Salud," a Spanish version of a community based chronic disease self-management program was beneficial in improving health behaviors and health status along the Texas/New Mexico Border (Lorig et al., 2005). In this study 445 persons with chronic illness (two thirds with diabetes) in Texas, New Mexico, and Mexico participated in a 6 week diabetes education program. Spanish speakers increased their use of physicians while decreasing hospitalizations, suggesting that they learned how to use health care more appropriately. Changes in self-efficacy in the early months after taking the courses, as well as initial self-efficacy before taking the courses were clearly associated with improved health behaviors and health status for 1 year. Both baseline self-efficacy and changes in self-efficacy were robust predictors of later outcomes. Self efficacy went from 6.17 and increased 1.17 points from a scale of 1 to 10 (p <.0001). This study and others suggest that teaching self-efficacy

might be key in successful self-management education outcomes of diabetes self-management programs targeted toward Hispanics (Lorig et al., 2005; Sousa et al., 2004).

#### 2.4.2.3 Measuring Self-Management Behaviors

Measuring the effectiveness of diabetes self-management is a difficult task because it involves data collection, and it becomes increasingly complex when trying to compare programs that do not have conformity in the data that is collected. According to the National Diabetes Education Outcomes System, data should be collected at the individual and program levels and then compiled to create a national database of information (Peeples et al., 2001). The American Association of Diabetes Educators states that the key outcome measure for education on diabetes self-management is behavior change, and it is recommended that diabetes educators should collect immediate, intermediate and long-term outcomes to monitor the impact of diabetes self-management education (Peeples et al., 2001). When implementing and evaluating programs aimed at effecting behavior change, especially programs that are theory driven, it is recommended to collect data not only on participants, but also on recruitment and retention efforts (Helitzer et al., 2006). Based on a review of the literature, there is currently no standardized set of data to determine the success of diabetes control at the individual level that includes both behavior change and glucose control. The best parameter available is HbA1c (GHB) because it gives us an overall picture of an individual's glycemic control over the previous 4 months. It has been suggested that it is necessary to incorporate questionnaires, surveys or in-depth interviews to identify specific self-management

recommendations that are not being followed and what barriers need to be addressed in order to achieve the recommendations (Helitzer et al, 2006).

The Diabetes Self Management Training Program provided diabetes education, a glucometer, an individual dietitian consult and monthly support for 70 people with type 2 diabetes in a community clinic in Texas. The results of this program showed an overall 15% decrease in HbA1c, maintenance of medication use or decrease of it, and maintenance of weight, despite the use of medication known to increase weight by some participants (Banister et al., 2004).

#### 2.4.2.4 Barriers and Facilitators to Diabetes Self management

Diabetes self-management can be impacted by a variety of factors in addition to self-management education strategies. Among others environmental factors, socio-economic status, disability, medical insurance and access to health care, and social support warrant special consideration.

#### 2.4.2.4.1 Environmental Factors

Characteristics of communities or neighborhoods (availability of health services, infrastructure deprivation, prevailing attitudes toward health, levels of stress and social support and environmental conditions) may influence general health outcomes (Brown et al., 2004). The socioeconomic position of a community as a whole can determine what kind of education, employment, income opportunities and social environments (crime rate, social capital, social isolation) individuals are susceptible to (Brown et al., 2004). Research has shown that environmental factors are a significant barrier to self-management of diabetes and often influences self-management resulting in suboptimal

adherence to recommendations (Vincze et al., 2004). Among low income persons, the costs of managing diabetes can include medications for diabetes and non-diabetes related conditions, physician fees, self-monitoring supplies, transportation to medical care facility and prioritizing necessities such as food and school supplies for children. If diabetes continues to be poorly controlled, all these costs can add up and impose financial challenges for low income individuals.

#### 2.4.2.4.2 Socioeconomic Status

Financial security has been shown to be an integral component of the path that leads to good glycemic control for this population (Martorell, 2005). Among the low income population with diabetes, the costs associated with having the disease are increasingly placing challenges in controlling their disease. One study of older adults with diabetes reported that 19% of respondents cut back on overall medication use due to cost, 11% cut back on diabetes medications, specifically over the past year and 28% decreased their spending on food or other essentials to pay medication costs (Piette et al., 2004). Priorities and other financial burdens may interfere with perceived ability to effectively do what is needed. In addition, cost of diabetes may be exacerbated if complications and associated disabilities also exist. One study published in 2003 showed the average hospital costs for acute patients who had diagnosed type 2 diabetes were: acute myocardial infarction \$17,376, angina \$5,739, ischemic stroke \$9,071, transient ischemic attacks \$4,837, first lower extremity amputation

\$17,555, second lower extremity amputation \$17,813 and foot ulcers \$8,327 (O'Brien et al., 2003).

Sociodemographic factors are important to consider because they might relate to achieving treatment and management goals, via limited financial and time resources, as well as, health care knowledge. Availability of health insurance, food security, cheap sources of fatty food and refined sugars, eating away from home, sedentary behavior and white-collar jobs have all been associated with the prevalence of obesity and diabetes (Martorell, 2005). Financial security has been shown to be an integral component of the path that leads to good glycemic control for this population (Martorell, 2005).

#### 2.4.2.4.3 Disability in Low-income Adults

One barrier for practicing self-management recommendations of type 2 diabetes is disability, but there is limited research on disability as it related to with self-management practices for type 2 diabetes in adults. If not recognized early or if poorly managed, diabetes can result in complications which in turn can lead to physical disability. In addition, obesity itself is an associative condition in type 2 diabetes that might also increase morbidity. This is important because of the fact that self-management might be a challenge if support to implement these necessary behaviors is limited. Most of the research on type 2 diabetes and disability has been is done with the older adult population and was usually associated with development of co-morbidities of type 2 diabetes as a result of disease progression (Gregg et al., 2002; Stuck et al., 1999; Volpato et al., 2003).

One longitudinal study looked at 1,294 adults with type 2 diabetes over an average period of 4 years and conducted a clinical assessment and assessment of depression, mobility and activities of daily living (Bruce et al., 2005). Researchers found that both mobility and decreased ability to perform activities for daily living were caused by diabetes complications and comorbidities (Bruce et al., 2005). They also found that those patients who develop mobility impairment were more likely to have peripheral neuropathy and history of stroke or arthritis (Bruce et al., 2005).

Another study looked at the health condition of persons applying for disability pensions and found that of the 200 persons who underwent a physical exam, two thirds had less than 13 years of education, 55% had worked in the service-sector, 59% never did any moderately vigorous exercise and about one in four were obese (Holtedahl, 2006). One other study conducted focus groups with African Americans and Latinos age 55 or older in Los Angeles to identify cultural and age-specific modifications to a self-care empowerment intervention. The main finding of this research was that participants identified disability consideration as an important missing content area in developing diabetes education (Sarkisian et al., 2005). Disability is one factor that contributes to unemployment as well as decreased likelihood of having medical insurance. Data on the relationship between disability, income, obesity and related diseases and availability of health care among adults age 55 and younger is limited.

#### 2.4.2.4.4 Medical Insurance and Access to Health Care

Latinos are the fastest growing minority group in the country. However, they also have the lowest rates of insurance and without access to proper health care, diabetes can progress and lead to an number of health problems (Raza, 2007). In a study aimed at evaluating the extent and types of health insurance coverage in a representative sample of U.S. adults with diabetes, it was found that Mexican-Americans are 23% more likely to lack health insurance than whites (Harris, 1999). One of those health problems commonly found in persons who have complicated or poorly controlled diabetes is retinopathy. One of they key recommendations from ADA to detect signs of retinopathy caused by diabetes is receiving an annual dilated eye exam (ADA, 2006). If an individual with diabetes does not have access to health care, they are three times less likely to have a dilated eye exam (Beckles et al., 1998). In a study that provided a framework for how socioeconomic status relates to health status of individuals with diabetes, it was found that those who were uninsured were less likely to have a foot examination. Hence, they were more likely to have poor glycemic control and have almost seven times the odds of having diabetes related complications such as retinopathy (Brown et al., 2004).

In Hispanic Health and Nutrition Examination Survey (HHANES) findings from 1982-84, Cuban Americans, among Hispanics, were more likely to have private insurance or availability of health insurance in the form of employee benefits versus Mexican Americans (Solis et al., 1990). Puerto Rican Americans were also more likely to be covered by Medicaid than Mexican Americans, but

they also had more female headed households eligible for Medicaid under Aid to Families with Dependent Children (Solis et al., 1990). One study in New York state was done to assess the status of diabetes medical care and selfmanagement among adult Puerto Ricans in New York City. Researchers conducted a random-digit-dialing telephone survey to obtain a probability sample of adult Puerto Ricans with diagnosed diabetes (n = 606). They collected demographic characteristics, health status, and indicators of diabetes medical care and self-management based on the standard Behavioral Risk Factor Surveillance System (BRFSS) questionnaire. In this study, researchers found this population was not disadvantaged in terms of access to health care. There was no difference between the Puerto Rican sample when compared to the state wide sample (63.9% vs. 64.5%) in visiting a health care provider as recommended by ADA of at least four times per year (Hosler et al., 2005). Puerto Ricans were more likely to have heath insurance and a regular place for care than other Hispanics (Hosler et al., 2005).

Therefore it seems that within the Hispanic population, some sub-groups might be experiencing more challenges with respect to health care. The ability to speak English was one barrier consistently identified throughout the literature as a determinant to whether Hispanics effectively obtained health care access (Lara et al., 2005; Lorig et al., 2005; Malentacchi et al., 2004; Solis et al., 1990). Location of residence could also be an explanation. Both of these factors are integrally linked to level of acculturation.

#### 2.4.2.4.5 Social Support

Social support has been found to be a relevant factor in diabetes selfmanagement (Garvin et al., 2004; Gleeson-Kreig et al., 2002; Spencer et al., 2006). One cross-sectional study specifically looked at 95 insulin-requiring Hispanic adults to explore who was in their support network, the type of assistance needed, and the relationship between social support and diabetes self-management. The results of this study showed that with regard to the social support in diabetes self management of this sample, 94% of participants stated they would expect family members to be available to help in at least one of the surveyed areas: shopping, buying medication, going to the doctor, calling diabetes clinic, house work, preparation of diabetes diet, self care behaviors, going to get blood work or urine tests, injecting own insulin, help because of illness, advice when not feeling well, personal care, and money to cover diabetes expenses (Gleeson-Kreig et al., 2002). Children were also the primary source to rely on for any help with diabetes related self-management (Gleeson-Kreig et al., 2002). In a different study, a convenient sample of 141 insulin-requiring individuals with diabetes, researchers found that diabetes self-management was significantly correlated with social support (p < .01), self-care agency<sup>3</sup> (p < .01), and self-efficacy (p < .01) (Sousa et al., 2004). Given the undoubted value for family in general. And the greater likelihood of reliance on family and or community support in the Hispanic people overall, it is not surprising that social support is also an important aspect of diabetes management, and should not be omitted as part of health care (Fisher et al., 2005).

<sup>&</sup>lt;sup>3</sup> An individual's capacity to perform self-care actions.

#### 2.5 Theoretical Foundation for Self-management Behaviors

Two theoretical frameworks were found to be appropriate to guide this study: the Social Ecological Theory adapted for diabetes self-management (Fisher et al., 2005) and the Enhanced Behavior Performance model for diabetes self-management, derived from the self-efficacy theory (Sousa et al., 2004). The integrated model is presented in **Figure 2.3** and it includes acculturation under the individual factors.

#### 2.5.1 Ecological Approaches to Self-management

The ecological perspective for self-management integrates the skills and choices of individuals first with the services and support they receive from family, friends, worksites, organizations and cultures and secondly with the physical and policy environments of neighborhoods, communities and governments **Figure 2.1** (Fisher et al., 2005).



**Figure 2.1** Social Ecological Theory: Correspondence of Ecological Levels of Influence with Resources and Supports for Self-management (Fisher et al., 2005).

There are many factors that contribute to an individual's behavior, which either support or detract from the likelihood of behavior change for diabetes selfmanagement. The ecological perspective shows that without access to convenient sources of healthy foods and safe and attractive settings for exercise in the built environment, an individual is less likely to make these modifications to their lifestyle change (Fisher et al., 2005).

In this model, Fisher et. al. identified six key resources and supports for self-management (RSSM) from an individual needs perspective: individualized assessment, collaborative goal setting, skills enhancement, follow-up and support, access to resources, and continuity of quality clinical care. They reflect on diabetes self management in the context of how the social environment influences disease progression (Fisher et al., 2005). Because self-management of diabetes has many influences, this model helps to identify factors that affect the interventions aimed at these individuals. Further, the ecological model shows the importance of interventions that are directed at changing interpersonal, organizational, community, and public policy which relate to supporting or decreasing the likelihood of behavior change. This model assumes that changes in the social environment may stimulate changes in individuals and that support of these individuals is then important for implementing and sustaining environmental changes (McLeroy et al., 1988).

#### 2.5.2 Enhanced Behavior Performance Model

The enhanced behavior performance model for diabetes self-care management includes personal and environmental factors and self care behaviors. In this model, personal factors include diabetes knowledge, self-care agency, self-efficacy, environmental factors include social support, and diabetes self-care management represents the behaviors/self-care action, **Figure 2.2** (Sousa et al., 2004).





This model demonstrated that individuals, who had greater knowledge of diabetes, had greater self-care agency and self-efficacy, which together contribute to better diabetes self-care management. Social support from family and friends also increase self-care capabilities and improved diabetes self-care management (Sousa et al., 2004). Social support and self-efficacy influenced practice of self-care behaviors and thus increase in self-management of diabetes (Sousa et al., 2004).

**Figure 2.3** is the integration of both the human ecology theory and the self-efficacy theories as modified for self-management of diabetes. Both models show that environmental factors, social support and self-care behaviors affect an individual's ability to achieve desired glycemic outcomes, which is the goal of

diabetes self-management. **Figure 2.3** includes acculturation in the conceptual map used for this study. Acculturation is an individual factor influenced by both the individual and environment which impact diabetes self-management practices and glycemic control. Findings from this review of the literature support this integrated model as one that addresses issues supported by previous research and thus is appropriate on which to base this study.



**Figure 2.3** Integrated Social Ecological Model and Adapted Self-efficacy & Enhanced-behavior Performance Model for Diabetes Self-Management (Fisher et al., 2005; Sousa et al., 2004).

## CHAPTER 3 METHODS

#### 3.1 Design

This was a cross-sectional qualitative study in which a convenience sample of adult Hispanic patients with physician diagnosed Type 2 diabetes were selected to participate in an in-depth interview regarding acculturation and life style factors related to self-management of diabetes. Both qualitative and quantitative methods were used to describe factors associated with selfmanagement practices and glycemic control in the sample.

#### 3.2 Site

A community-based clinic in Lansing, MI (Cristo Rey Clinic), which primarily serves low-income persons was selected for this study. The clinic has a high attendance by diverse group of low-income Hispanic people, but is not limited to people of Mexican, Spanish, Puerto Rican and Cuban descent. The clinic accepts Medicare and Medicaid and permits a sliding fee scale for persons without insurance. Clinic administrators were supportive of this research, and as required, informed consent was obtained (**Appendix B**).

#### 3.3 Participants

A convenience sample of approximately 14 adults with acceptable (HBA1c <8%) and 16 with unacceptable (HbA1c  $\geq$ 8%) glycemic control participated in this study. Eligibility criteria were adults over 18 years of age who were of Hispanic ethnicity, physician diagnosed with Type 2 diabetes, had attended the

clinic for at least one year and had complete biomedical data in medical records, as well as availability for at least one year. This ensured that data were available and patient follow-up was possible when necessary. Participants who completed the assessment received a \$25 gift certificate as an incentive.

#### **3.4 Procedures**

Prior to study commencement, meetings with the physician and staff on site were conducted to determine feasibility. Institutional Review Board (IRB) approval was obtained from Michigan State University's Committee for Research Involving Human Subjects (UCRIHS) after the clinic director approval was obtained (**Appendix C**). At the Cristo Rey Clinic, patients typically come in to see the physician with or without an appointment for about 30 minutes, making recruitment of participants possible in two ways. The doctor and clinic staff referred potential participants, and participants were also recruited via clinic and UCRIHS approved flyers posted at the clinic (**Appendix D**). The investigator approached potential participants, obtained signed consent (**Appendix B**), scheduled an interview date and time or conducted the interview immediately. The interview was conducted in a designated consulting room within the clinic.

There were *four steps* of data collection for each subject (See **Table 3.1**). *First* a preliminary chart review served to determine patient eligibility criteria. When laboratory data were missing, the physician requested the patient to permit clinic staff to complete the laboratory tests missing.

Number	Step	Data Collected
	UCRIHS and Clinic Approval	
II	Participant recruitment	
1	Eligibility	a. Hispanic descent b. Age >18 years c. Physician-diagnosed with type 2 diabetes d. Completeness of biochemical data e. Records available for one or more years
2	Interview – in-depth interview, acculturation assessment, 24- hr dietary recall, socio- demographic information	<ul> <li>a. Signed consent</li> <li>b. Interview guide</li> <li>c. Acculturation level via modified version of ARSMA</li> <li>d. 24-hour dietary recall</li> <li>e. Socio-demographic instrument</li> </ul>
3	Chart Review	a. In-depth chart review to determine: Glycemic control Duration of diabetes Use of other medications prescribed to treat diabetes or associated diseases/ comorbidities Weight and height
4	2 <sup>nd</sup> Day 24-hour dietary recall	2nd 24-hour dietary recall by phone or in person Incentive administration

# **Table 3.1** Comprehensive study sequence for obtaining qualitative and quantitative data.

The *second* step was the scheduled in-depth interview (**Appendix E**) of directed questions regarding diabetes self-management and acculturation (modified ARSMA-II), a 24-hour dietary recall and short diet history. At this time, the interviewer also elicited responses to a questionnaire on socioeconomic status, years of schooling, availability of medical insurance, access to health care, whether the participant monitored blood glucose at home, took medications as prescribed, followed a recommended diet, was trying to lose or maintain weight, visited an ophthalmologist and visited their doctor at least once per year (**Appendix E**).

The *third* step in the assessment was an in-depth medical chart review to determine biomedical markers of diabetes control (HbA1c and lipid profile) (**Appendix F**), diabetes progress, presence of diabetes complications and agreement between interview and medical records. The chart review followed the in-depth interview or was done after missing laboratory data were obtained.

The investigator obtained two 24-hour dietary recalls following standardized procedures and using food models for portion sizes (Conway et al., 2004; Conway et al., 2003; Jonnalagadda et al., 2000). The first recall was collected at the end of the in-depth interview and the second dietary recall (*fourth step*) was collected by phone or by office visit on a scheduled date and time. Typically, the second diet recall was collected within one week of first. These were used to assess cultural food choices. The participant received compensation (a gift certificate for a local grocery store) when the following parts of the study were completed: 1) Signed consent forms, 2) In-depth interview, 3) Both first and second diet recall, and 4) Complete medical chart data.

#### 3.5 Instruments

The in-depth interview guide in **Appendix E** was developed based on research objectives and questions with corresponding interview questions. **Table 3.2** lists the research objectives, research questions and corresponding interview questions. The investigator pilot tested the interview guide to help establish face validity with five Hispanic adults, two of whom were over 72 years of age; three were male and two were female. The ability of the instrument to elicit valid responses was checked by interviewing the spouses of the three men.

Results of this pilot testing for validity led to revisions of the guide towards use of

simpler language and the addition of probes.

Table 3.2 Research ob	jectives, research	questions a	and correspondi	ng interview
questions.	-	-		-
			· ··	

Research Objectives	Research Questions	Interview Questions
1) To describe and contrast self-management behaviors in Hispanic adults with physician diagnosed type 2 diabetes and who are either in acceptable (HbA1c < 8) or unacceptable	1. How do subjects perceive the impact of the disease and required self-	20) Describe how having diabetes has changed your life. What do you do differently now? <i>Prompt: after being</i> <i>diagnosed with diabetes? How has your</i> <i>daily routine changed</i> ?
glycemic control (HDA1C $\geq$ 8).	management behaviors?	23) Describe some of the things you do well about managing diabetes and why? <i>Prompt: Which of these do you do best?</i>
		24) Describe some things that you don't do well. Prompt: What makes it difficult for you to do this well?
		25) What if any, are the advantages to managing your diabetes? Why?
	1. How do subjects perceive the impact of the disease and required self-	27) What do you do on a daily basis to take care of yourself or your diabetes? Prompt: exercise, medical care, diabetes education school? What do you think is the best way for you to take care of yourself?
	management behaviors?	28) What would you like to do to be healthy?
		29) What helps you in taking care of yourself? Prompt: What are some things that helped you manage your diabetes?
		30) Are there any specific foods or other things that you believe help you with your diabetes? <i>Prompt: What are they? Tell me how they/it helps you?</i>

Research Objectives	Reearch	Interview Questions
	Questions	Interview Questions
1) To describe and contrast self-management behaviors in Hispanic adults with physician	2. How does location of residence	14) Describe the community that you live in? <i>Prompt: Is it safe, tranquil, dangerous?</i>
diagnosed type 2 diabetes and who are either in acceptable (HbA1c < 8) or unacceptable	influence diabetes self- management?	15) How does where you live affect how you can care of managing your diabetes?
glycemic control (HbA1c $\geq$ 8). (Cont'd)	4. How does health care facility influence	33) What is it about where you go for health care that you like or dislike and why?
	diabetes self- management?	34) What do you think the role of the doctor should be in helping you with your diabetes?
		36) What organizations, groups, individuals do you get helpful information from?
2) To determine if and how acculturation relates to self- management behaviors and diabetes control in Hispanic adults with physician	3. What is the relationship between support networks (family.	16) If they have relatives who had diabetes ask: How do you think having diabetes is different for you compared to your family members with diabetes?
diagnosed type 2 diabetes and who are either in acceptable (HbA1c < 8) or unacceptable alvcemic control (HbA1c > 8).	institution, friends) and diabetes self- management?	17) When you first found out you had diabetes, who was the most helpful and how?
<i>,</i>		18) Describe the different responses you received when you first told your family you had diabetes? Prompt – Can you give me an example? were they supportive of it? Did

they help in your diabetes management? If

diabetes, to whom do you turn to and how do they respond? *Prompt – friends, family,* 

21) How has having diabetes changed how

35) Where and from whom did you learn

37) What has been the most helpful

19) When you need help with your

so, how?

doctor

you act with friends?

how to take care of yourself?

resource or thing for you?

Table 3.2 F	Research objectives	s, research	questions	and corre	sponding i	nterview
questions. (	(Cont'd)					

Beearch Objectives	Reearch	Interview Questions
	Questions	11101 11CM (2003110113
2) To determine if and how acculturation relates to self- management behaviors and	5. How does diabetes knowledge of	13) Can you tell me what diabetes is?
diabetes control in Hispanic adults with physician diagnosed type 2 diabetes and who are either in	Hispanic persons influence self- management of diabetes?	22) What have you been told is important in taking care of your diabetes? <i>Prompt: How do you feel about that</i> ?
acceptable (HbA1c < 8) or unacceptable glycemic control (HbA1c $\geq$ 8). (Cont'd)		26) What do you think the role of medicine is in managing diabetes? What do you think the role of food is in managing diabetes? Prompt: Do you think that one is more important than the other?
		38) Have you taken classes on diabetes? Prompt: If no, Do you know if diabetes education is available to you?
	6. What do Hispanic individuals with type 2 diabetes	31) What keeps you from taking care of yourself? Prompt: What are some of the difficulties in managing your diabetes?
	perceive to be facilitators and inhibitors for better managing their diabetes?	32) What is the most difficult thing about controlling your diabetes?
	7. What is the relationship between acculturation and type 2 diabetes control?	<ol> <li>Acculturation Rating Scale for Mexican Americans –II (5 levels)</li> <li>Glycemic control – HbA1c value from medical chart review (two groups)</li> </ol>

**Table 3.2** Research objectives, research questions and corresponding interview questions. (Cont'd)

The acculturation scale, Acculturation Rating Scale for Mexican American - II (ARSMA-II), developed by Israel Cuellar was validated with a population of 222 Mexican American youth and adults (Cuellar et al., 1995). The ARSMA-II as depicted in Figure 3.1 is a short version of 30-item Likert type scale questions, which measures acculturation along three primary factors: language, ethnic identity, and ethnic interaction. ARSMA-II is able to generate both linear acculturation categories (Levels 1-5) and orthogonal acculturative categories (Traditional, Low Biculturals, High Biculturals, and Assimilated). Although the name implies that this instrument is used for Mexican Americans, it has been adapted for use with other Latino subgroups (Solis et al., 1990). The instrument reliability was tested on adults and seniors of Mexican origin by Cuellar et al.. (1995) and divided into two sub scales: Mexican Oriented Subscale (MOS, acculturation levels 1-2) and Anglo Oriented Subscale (AOS, acculturation levels 3-4). The Cronbach alpha for MOS was =0.92 and for the AOS subscale, Cronbach alpha = 0.87.

The two subscales in ARSMA-II measure cultural orientation to Mexican and Anglo cultures independently rather than evaluating them together which would force an individual to lean on one culture more than the other (Cuellar et al., 1995). Traditional indicates that a person scores high on the Mexican Oriented scale and low on the Anglo oriented scale; Low bicultural scores low on both scales, high bi-culturals score high on both scales and assimilated scored high on Anglo Oriented scale and low on Mexican Oriented Scale. For this research, the administration of the ARSMA-II was modified simply by having the

interviewer ask the questions, rather than having it self-administered. This format would decrease concerns about participant's literacy and reduce the likeliness of missing values. This also improves the consistency of values by having the same researcher ask questions and interpret the answers.





Level of acculturation was determined from the ARMSA-II (a subcomponent of **Appendix E**) and was analyzed by obtaining two scores for each subscale. The first subscale, Mexican Orientation Subscale (MOS) included questions 40, 42, 45, 46, 47 and 50 in the Interview Guide (**Appendix E**). The questions were answered using a five point Likert scale from 1-5 for "not at all" to "almost always/extremely often" and the mean of these items was the score for MOS. The second subscale, Anglo Orientation Subscale (AOS) included questions 41, 43, 44, 48, 49 and 51 in the Interview Guide (**Appendix E**), which were averaged for the AOS score. Once the two subscale scores were obtained, the mean AOS and mean MOS were subtracted to obtain a number that identified which subscale the participant's acculturation was stronger. Participants were dichotomized into the MOS group, by a score  $\leq$ -0.07 and the AOS group >-0.07. Thus a more positive score indicated Anglo orientation and a more negative score indicated Mexican orientation. In addition to the ARSMA-II, two additional questions were asked for cultural information "What is your country of ethnic origin?" and "Do you use home remedies?" This information was used to obtain additional information that may influence self-management of diabetes in this sample that may not have been captured in the acculturation score or the in-depth questionnaire.

#### 3.6 Data Analysis

Glycemic control, defined as HbA1c <7%, was the dependent variable used to categorize subjects as acceptably versus unacceptably controlled groups. An attempt was made to obtain representative samples in both these groups in order to be able to gain a better understanding of how acculturation and other factors were exhibited in Hispanic adults with Type 2 diabetes, based on level of diabetes (glycemic) control. In addition, study participants were also grouped by acculturation as AOS or MOS for analysis to determine if there were differences in patterns of self-management practices based on acculturation. The explanatory variables were acculturation, age, duration of diabetes, socioeconomic status, years of schooling, duration of diabetes, medical insurance, access to health care and self-management practices.

Quantitative data was used for descriptive purposes and included univariate analysis on socio-demographic factors, laboratory values and the ARSMA-II Scale, descriptive statistics were obtained by using SPSS (13.0, Chicago, Illinois, SPSS Inc.). Dietary recalls were analyzed using Nutritionist Pro (3.1.0, Stafford, TX, Axxya Systems) and compared to the nutrition guidelines recommended by the American Diabetes Association in **Table** 2.3 to determine adherence to recommendations for self-management of diabetes (Bantle, 2006).

The qualitative data was obtained from all the interviews, (n=30), which were tape recorded and transcribed verbatim. All transcripts were read and checked for accuracy by listening to the tapes to correct errors and increase familiarity with the data. The researcher and a trained assistant coded the

transcribed interviews to identify themes and sub themes. Coding was agreed upon by both individuals to confirm themes (**Appendix G**).

Therefore, qualitative research methods were confirmed with the biomedical data and medical notes in order to strengthen our understanding of the data. Triangulation was used to relate the interview information, to biomedical data and medical notes as a means of ensuring validity. For example, the participant was asked, "How many times per year do you visit the doctor?" Their response was triangulated to the actual number of times they visited the doctor based on their medical chart review where we noted how many times in the past year they visited the doctor and the number of HbA1c laboratory results in the medical chart for the past year.

Specifically, the two days of dietary intakes were evaluated for achievement of at least 130g carbohydrates/day, 50g of fiber/day, use of artificial sweeteners, <200 mg/per day of dietary cholesterol, 15-20% total calories from energy per day and alcohol intake. In addition, the types of foods were examined for frequency of fast food consumption, and culturally based foods like tortillas and picadillo, were listed and compared by glycemic control and acculturation group.

#### CHAPTER 4

#### RESULTS

This chapter presents the descriptive and dietary data with findings grouped according to relevance of each research objective. For the most part, quantitative data are presented first followed by qualitative data next for explanation.

#### 4.1 Descriptive Data

Thirty participants of Hispanic descent agreed to participate in this study, 13 males and 17 females, averaging 50 years of age and ranging from 32 to 72 years of age. The subjects' characteristics for each glycemic control group and acculturation group are summarized in **Table 4.1.** Most participants (n=23) selfidentified their ethnic origin as Mexican, with 14 categorized as Mexican oriented from the acculturation scores. Those with acceptable glycemic control (n=13) vs. those with unacceptable control (n=17) appeared to be more likely to be employed and less likely to be disabled; acculturation appeared unrelated. Mexican-oriented participants were about 8 years younger than those who were Anglo oriented. **Table 4.2** shows the BMI in groups cross tabulated for glycemic control and acculturation. No statistical tests were done for group comparisons, nor were they appropriate for this type of study design.

Table 4.1 Demograph frequencies)(n=30).	hics, acculturati	ion, anthropometrics	of the sample by glyce	mic control or accultu	ıration (mean ±SD,
Variable	Total Sample n=30	Acceptable Control (< 8% HbA1c) (n=13)	Unacceptable Control (≥ 8% HbA1c) (n=17)	Mexican Ori <del>e</del> nted <sup>1</sup> (n=14)	Anglo Oriented <sup>2</sup> (n=16)
Gender					
Males	13	7	9	7	9
Females	17	9	E	œ	8
Age vr (+SD)	50.9	53.1	49.1	46.5	54.6
	$(\pm 10.4)$	$(\pm 10.9)$	(+9.6)	(+9.4)	(+9.6)
Hispanic subgroup	!	Į	!	!	
Mexican	23	6	14	11	12
Spanish	4	-	e	2	2
Cuban	0	2	0	0	2
Puerto Rican	-	-	0	-	0
Acculturation status MOS <sup>1</sup>	14	ŋ	σ	ى س	ω
AOS <sup>2</sup>	16	ω	ω	თ	Ø
Duration of Diabetes, yr	8.3 (+5.8)	6.5 (+5.6)	9.6 (+5.7)	9.7 (+4.6)	7.0 (+6.5)
Employment Status					
Full/Part time	13	<b>8</b> *	ъ С	9	7*
Disabled	12	-	ŧ	5	7

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Variable	Total Sample	Acceptable Control (n=13)	Unacceptable Control (n=17)	Mexican Oriented <sup>1</sup> (n=14)	Anglo Oriented <sup>2</sup> (n=16)
Homemaker/Retired	Q	4	-	£	-
Height in (n=28)	63.4	62.8*	63.9	63.3*	63.6*
	( <u>+</u> 3.6)	( <u>+</u> 3.6)	(±3.6)	( <u>+</u> 4.2)	(±3.1)
Weight Ib (n=30)	207.3	200.9	212.7	217.8	198.3
	( <u>+</u> 45.6)	(±53.3)	( <u>±</u> 39.7)	(±53.3)	(±37.0)
BMI (kg/m²) (n=28)	36.3	35.5**	36.8	38.0*	34.8*
	( <u>+</u> 9.6)	(±12.2)	(土7.8)	(±11.3)	(±7.9)
<ul> <li>One participant was em</li> <li>** Height unavailable for</li> </ul>	ployed, but did not two participants.	t work enough hours to b	e considered full-time (40 h	rs).	

Table 4.1 (Cont'd)

<sup>1</sup> MOS=Mexican Oriented Subgroup based on value of difference between Mexican oriented subscale and Anglo oriented subscale of ≤ -0.07 on the ARSMA-II scale. the ARSMA-II scale. <sup>2</sup> AOS= Anglo Oriented Subgroup based on value of difference between Mexican oriented subscale and Anglo oriented subscale of > -0.07 on the ARSMA-II scale.

	Mexican Oriented (n=14)	Anglo Oriented (n=16)
Acceptable (<8% HbA1c) (n=11,13)	37.6	34.0
	( <u>+</u> 15.0)	( <u>+</u> 11.7)
	n=4-5	n=7-8
Unacceptable (≥8% HbA1c) (n=17)	38.1	35.5
()	( <u>+</u> 10.3)	( <u>+</u> 3.9)
	n=9	n=8

**Table 4.2** Body Mass Index mean ( $\pm$ SD) by acculturation and glycemic control.  $n=30^{1}$ 

'Height was unattainable for 2 participants, but both were acceptably controlled.

#### 4.2 Key Dietary Data

Dietary data averaged from two 24-hour dietary recalls, showed that participants in the acceptable glycemic control group were more likely to consume 1500 or fewer calories, less than 300 grams of carbohydrate less than 30 grams of saturated fat, less that 200 mg cholesterol and less than 100g protein per day compared to those in the unacceptable control group **Table 4.3**. Participants with unacceptable glycemic control and who were of Mexican orientation were the most likely to consume  $\geq$  2100 calories per day. All participants in the unacceptable control group ate greater than 300 grams of carbohydrate per day. Overall, eating breakfast was a common practice, but fiber intake was low.

	Total	Acceptable Control, MOS (n=13)	Acceptable Control, AOS (n=17)	Unacceptab le Control, MOS (n=14)	Unacceptab le Control, AOS (n=16)
How many times per week do you eat meals with your family?					
None	3	0	1	1	1
1-7	18	4	4	7	3
8-15	9	1	3	2	3
Breakfast per week (times/wk) 0-3	9	2	1	3	2
4-7	21	3	7	7	3
Problem digesting milk?	4	0	1	2	1
Energy, (kcal) <1500	10	4	4	1	1
1500-2100	9	1	2	1	5
>2100	11	0	2	8	1
Carbohydrate, g <200	12	3	4	2	3
200-300	11	1	3	4	3
>301	7	1	1	4	1
Saturated fat, g <15	8	3	2	2	1
15-30	13	2	4	3	4
>30	9	0	2	5	2
Cholesterol, mg <200	8	3	2	1	2
200-400	8	2	2	1	3
<u>≥</u> 401	14	0	4	8	2
Dietary fiber, g <25	24	4	7	7	6
<u>&gt;</u> 25	6	1	1	3	1

**Table 4.3** Selected nutrients and diet history items from two 24-hour diet recalls\*, by glycemic control groups and by acculturation groups. (n=30)

	Total	Acceptable Control,	Acceptable Control,	Unaccepta ble Control.	Unaccepta ble Control.
		MOS	AOS	MOS	AOS
Protein, g					
<50	7	2	3	1	1
50-100	15	3	4	4	4
>100	8	0	1	5	2

#### Table 4.3 (Cont'd)

Two of the 30 participants had only one day of dietary intake due to incorrect phone numbers. MOS = Mexican Oriented Subgroup based on value of difference between Mexican oriented $subscale and Anglo oriented subscale of <math>\leq$  -0.07 on the ARSMA-II scale. AOS = Anglo Oriented Subgroup based on value of difference between Mexican orientedsubscale and Anglo oriented subscale of > -0.07 on the ARSMA-II scale.

Some differences in types of foods consumed were observed when participants were categorized by glycemic control and acculturation (**Table 4.5**). Those with acceptable glycemic control and Mexican oriented were those most likely to report eating salads. Participants in the acceptable glycemic control and who were Anglo oriented reported the most fruit. Participants with unacceptable glycemic control reported the most fruit. Participants with unacceptable glycemic control reported the most frequent intake of both fast foods and cultural foods.

	Acceptable Glycemic Control	Unacceptable Glycemic Control
Mexican Oriented	(n=5)	(n=9)
Subgroup	Salads (4)	Tortillas (8)
<b>C</b> .	Water (5)	Fast Food (4)
	Milk (4)	Picadillo (2)
	Coffee (2)	Tacos (2)
	Sandwich (2)	Barbacoa (1)
		Menudo (1)
Anglo Oriented Subgroup	(n=8)	(n=8)
	Fruits:	Sausage (5)
	Apple (6)	Tortillas (8)
	Grapes (2)	Spanish Rice (2)
	Watermelon (2)	Tacos (1)
	Strawberries (2)	Menudo (1)
	Banana (1)	Mole (1)
	Mango (1)	Buñelos (1)
	Blueberry (1)	Fast food (1)
	Pineapple (1)	Pork chops (1)

**Table 4.4** Frequency of types of food reported by glycemic control and acculturation groups from two days of dietary intake.

Acceptable Glycemic Control=(<8% HbA1c)

Unacceptable Glycemic Control=(≥8% HbA1c)

MOS=Mexican Oriented Subgroup based on value of difference between Mexican oriented subscale and Anglo oriented subscale of  $\leq$  -0.07 on the ARSMA-II scale.

AOS=Anglo Oriented Subgroup based on value of difference between Mexican oriented subscale and Anglo oriented subscale of > -0.07 on the ARSMA-II scale.

### 4.3 Facilitators and Barriers, Descriptive Data

Facilitators and barriers to glycemic control were organized according to the

individual, environmental and behavior/lifestyle factors from Figure 4.1 for each

of the four subgroups (Table 4.5). Some responses fit into more than one factor

demonstrating the complexity of disease management and the interactions

between the individual, environment and self-care behaviors necessary to

achieve glycemic control. Those with acceptable glycemic control made more

frequent comments reflecting recognition of diabetes and the disease

progression more frequently than those with unacceptable glycemic control. A
striking finding was the frequency with which all subgroups associated following diet recommendations for diabetes as a facilitator more times than associating it as a barrier. Use of home remedies, elicited from the intake form, was common in all groups and cited as both a facilitator and barrier to glycemic control. Social support, from both the family and the healthcare institutions, was more frequently cited as a facilitator than as a barrier by all subgroups.

Table 4.5.Frequency of respparticipant subgroups of glyceThematic Responses	conses dichomitized as emic control or accultu As	s facilitati iration al Facilitate	ors and nd class ors	barriers iffied by	s for gl) ecoloç	/cemic control aı <u>jical model paraı</u>	nd orga meters. As Barr	nized t iers	2	
		AC	S	NOS	AOS		AC	S	MOS	AOS
	-	n=13	n=17	n=14	n=16	-	n=13	n=17	n=14	n=16
Individual Factors										
Diabetes knowledge	Recognition of disease progress/ complications; Science-related explanation	35	62	51	63	Lack of disease understanding	14	13	თ	18
Behavior/Lifestyle Factors										
Self-management										
Ease of regular exercise	Improved well-being	24	30	19	35	Physical disability	23	19	16	26
Ease of following diet	Improved well-being; Fruits and vegetables improve well-being	112	110	101	121	Lack of financial resources; Cultural foods	35	37	29	43
Ease of taking medications as prescribed	Improved well-being; Control diabetes	39	64	43	60	Forgetfulness	~	=	თ	თ
Ease of self-monitoring blood glucose	Improved well-being	9	18	14	10	Forgetfulness	0	2	2	0
Use of home remedies (from intake form)		80	2	8	7		8	7	8	7

Table 4.5. (Cont'd)										
Thematic Responses	As fac	cilitators					As bai	rriers		
		AC	nc	SOM	AOS		AC	nc	SOM	AOS
		n=13	n=17	n=14	n=16		n=13	n=17	n=14	n=16
Environmental Factors										
Social Support										
Family	Support by encouragement and motivation; Offer advice; Only source of support; Motivated by recognizing disease progress/complications	52	72	23	12	Family turmoil; lack of support	24	53	19	28
Health Care Institution	Staff friendliness; Feeling of family; Education reinforcement	91	105	83	113	Lack of referral; Long waits; Discontent	N	ω	N	ω
Neighborhood	Safety; Proximity; Ease of transportation	თ	16	5	13	Unsafe activity; Unfamiliar surroundings; Physically unable to get around	~	1	=	13
AC= Acceptable glycemic cont	itrol (<8% HbA1c)									

UC= Unacceptable glycemic control (≥8% HbA1c) MOS= Mexican Oriented Subgroup based on value of difference between Mexican and Anglo oriented subscales where ≤ -0.07 AOS= Anglo Oriented subgroup based on value of difference between Mexican and Anglo oriented subscales where > -0.07



**Figure 4.1.** Integrated Social Ecological Model and Diabetes Self-Management with Barriers and Facilitators (Fisher et al., 2005; Sousa et al., 2004) HbA1C= Hemoglobin A1c where glycemic control is value <8% HbA1c; DM2= diabetes mellitus, type 2.

## 4.3.1 Individual Factors

Participants with acceptable glycemic control were most likely to always follow the dietary recommendations **(Table 4.6)**. Those who were Anglo oriented in their acculturation report slightly higher frequency of exercise compared to those with MOS orientation.

**Table 4.6** Frequency of diabetes self management behaviors by glycemic control and acculturation subgroups.

	Total	Acceptable Control, MOS	Acceptable Control, AOS	Unaccepta ble Control, MOS	Unaccepta ble Control, AOS
	(n=30)	(n=5)	(n=8)	(n=9)	(n=8)
Follows a diet					
Always	12	3	4	3	2
Sometimes	8	0	3	4	1
Never	10	2	1	3	4
Exercises, yes	26	1	6	9	6
Min exercise					
<u>&lt;</u> 15	4	0	1	2	1
30-59	12	2	4	3	3
<u>≥</u> 60	14	3	3	5	3
Times / wk exercise					
0-2	5	1	2	1	1
3-5	16	4	2	8	2
6-7	9	0	4	1	4
Checks blood sugar at home	22	3	7	7	5

	Total	Acceptable Control, MOS	Acceptable Control, AOS	Unaccepta ble Control, MOS	Unaccepta ble Control, AOS
	(n=30)	(n=5)	(n=8)	(n=8)	(n=8)
Years since DM diagnosis					
<u>&lt;</u> 2	4	0	3	0	1
3-5	10	1	4	2	3
6 <u>≥</u> 11	16	4	1	8	3
Years schooling					
0-9	15	4	4	4	3
10-12+	15	1	4	6	4
Country of education US	20	2	4	8	6
Other	9	3	3	2	1
Consecutive yr in US					
<u>≤</u> 15	6	2	3	1	0
15-30	4	1	0	2	1
>30	20	2	5	7	6
No class on DM	22	4	8	4	6
No knowledge of available DM classes	18	3	5	5	5

**Table 4.7** Frequency of individual factors related to diabetes by glycemic control and acculturation status.

HbA1c=Hemoglobin A1c where glycemic control value is, 8% HbA1c DM=diabetes mellitus

Participants with unacceptable glycemic control appeared to have had diabetes the longest, be the most likely to be educated in the US, have the most schooling and lived in the US the longest **(Table 4.7)**. Overall the educational level was low, with only one person having post high school education (data not shown). Those in the Mexican oriented group were most likely to have diabetes

for 6 or more years. Those who were Anglo oriented were most likely to have not had a DM class, although most participants had taken no classes on diabetes and were not aware of classes available. The most common response reflected that participants overall did not know what diabetes was. "Well no, well I have no idea, I know it's diabetes, but I don't even know what it is." [Female, AC, MOS]

Symptoms or complications related to diabetes emerged when participants were unable to describe diabetes. Most all could not articulate a clear understanding of the disease, but rather related diabetes to the symptoms or complications such as having to do with 'the blood', can "lead to death" and causing "pain in the body." "It's what it is; a blood disease it is. I know it's in the pancreas, something to do with the pancreas." [Female, UC, AOS]

Others considered the disease outcome or complications when diabetes remained uncontrolled.

"Diabetes is an illness that is there, and that if I don't take care of myself, I'll die. I know that I am conscious that diabetes is dangerous, whether it's the [type] one or [type] two. There's one that's more difficult, right? But any diabetes if you don't take care of yourself, it has consequences." [Female, UC, AOS]

"It's a difficult disease, above all psychological I feel. It affects one emotionally more than anything. Well to me, it affects me more in that sense. Yes, because I never got sick when I was, when I didn't have diabetes. I didn't get sick and now normally anything and one gets sick, cold, anything. Really if one goes anywhere and there's a cold, right away it one gets it. Well I get it very easily. That disease, yeah, that is it." [Female, UC, MOS]

"Diabetes, it's really bad, bad disease I have. It just sucks the life out of you. It's real bad. It hurts, makes your whole body hurt. It's terrible." [Male, AC, AOS]

## 4.3.2 Behavior

When asked to, "Describe how having diabetes has changed your life,"

responses corresponded to diabetes self-management recommendations and to

the difficulty of daily performance.

"Hmm, I don't eat a lot of stuff, junk food. I don't eat as much as I used to eat. I'm learning to eat in portions and stuff. But sometimes it's frustrating, because, before I didn't know what I could eat and what I couldn't eat. Now they're telling me it's not what you eat, it's how much you eat." [Female, UC, MOS]

"Well first I gotta poke my finger to make sure what it is. Then I gotta control it you know like if it's going down or normal, I just shoot so much. I try to, I'm going like, okay, I'm low, so I'll eat a piece of candy, but not as much, because I don't want to get it sky high. I just give it a couple of bites and see how I feel. If I start feeling like, blurry, my vision gets blurry and stuff, then I know I went too much. So then I gotta go look for my insulin." [Male, UC, AOS]

Beliefs in benefits of specific foods in relation to diabetes also

emerged."Well, I think that what my daughter is giving me is good, but I like

pepper a lot. I like all that, and the doctor says that it's not bad for me. That's why

I don't have a lot, a lot of diabetes. They say that pepper cuts a lot of disease and

one doesn't believe it, but that's what he told me." [Female, AC, AOS]

When asked about the role of medicine in managing diabetes, responses

related to glycemic control.

"Oh, you know what? I don't [know] too much about the medicine. But you see I've been reading a book about diabetes. You can take the medicine just to prevent from getting higher or lower, whatever you call it. But other than that, I don't know too much about it." [Male, AC, AOS]

When asked about barriers to self-management, many responded with the

physical and financial costs.

"Walking is very hard for me. My legs, they swell up and everything makes [it] hard to walk. I lay there. If I'm on it too long, I'm in bed for a day or two, 'cause it aches real bad. My whole side of my body hurts, you know [Wife: He's got his wheel chair sometimes]" [Male, AC, AOS]

"I know more less what I should and shouldn't eat. But when you don't have the way to get it, that's hard on a person. If I could buy what I needed to eat right, because of my diabetes, I would be a lot healthier. I wouldn't have to worry about the, 'Oh my sugar's over 500,' or whatever. But I'm not going to lose a liver. I'm not going to lose this. If we could have that part, then we could buy the food that was necessary. Then we'd be a lot healthier instead of having to worry about what is that you're eating there. Starch, uh, I don't want that." [Female, UC, AOS]

## **4.3.3 Environmental Factors**

Most participants (n=22) did not feel they had enough income, although they did have some financial and medical assistance. Most of those with medical assistance, six, had the Ingham County Health Plan which is not insurance, but provides health benefits to low income, uninsured residents of the county, who are not eligible for Medicaid, Medicare, or other programs. Participants did not feel this was a major resource for them. Only three participants responded that insurance had been the most helpful resource.

**Table 4.8** summarizes the environmental factors obtained from both the medical chart review and the demographic interview questions. Those with unacceptable glycemic control were most likely to have little money and fewer than 5 visits per year. Most participants visited the health clinic four to nine times per year; five people attended the clinic 15-22 times per year (not shown). A dependency on the clinic for support emerged; there were 196 instances where

the clinic, doctor, nurses, or staff were mentioned as facilitators for their diabetes during the in-depth interview as shown earlier in Table 4.5. Less than half of the people (n=12) had visited an ophthalmologist within the past year, perhaps due to the minimal coverage of their health care program.

		Total	Acceptable Control, MOS	Acceptable Control, AOS	Unaccepta ble Control, MOS	Unaccepta ble Control, AOS
			(n=5)	(n=8)	(n=9)	(n=8)
Financi	ial resources					
	Little money	22	3	6	7	6
Medica	Enough money	8	2	2	3	1
	None	1	1	0	0	0
	Medicare &/or Medicaid	7	1	2	3	3
	BCBS or PHP	2	1	0	0	1
	Ingham County Health plan	14	3	3	6	1
	PHP	1	0	0	0	1
	Other Plans	3	2	1	0	2
Doctor	<sup>r</sup> visits/yr 0-5	12	2	2	4	4
	6- 22	18	3	6	6	3
Ophtha	almologist visits/yr	12	2	4	3	3

**Table 4.8** Environmental factors by glycemic control and acculturation subgroups, n=30.

BCBS=Blue Cross Blue Shield/ PHP= Physicians Health Plan

MOS= Mexican Oriented Subgroup based on value of difference between Mexican and Anglo oriented subscales where  $\leq$  -0.07

AOS= Anglo Oriented subgroup based on value of difference between Mexican and Anglo oriented subscales where > -0.07

Environmental factors that also emerged from the in-depth interviews were the social support that the family and health care institution provided. The family offered support by direct encouragement, and by motivating participants to seek care after observing a family member sick with diabetes. In response to, "What would you like to do to be healthy?" an interest in seeing their family mature was commonly voiced.

"Just live healthy, just live life. See my kids graduate, see my grandkids, you know." [Female, UC, MOS]

When participants were asked "How do you think having diabetes is

different for you compared to your family member with diabetes?" prevention and

recognition of the progression of diabetic complications became a comparison

point.

"The only person that I can relate to is my grandfather. He went through a lot. When I was younger, I remember he had his leg amputated. He went through a lot of pain and I remember that. I don't, I can't, even start to think how it was for him to handle, losing his leg, being sick, not speaking English. As for me, it's tough. It's just, I think diabetes affects everybody different ways, and, like I said, at different levels. 'Cause it hits people at different times of their lives. And like with me, I'm 32 years old. There's a lot of things I want to do, and I probably could do some of them still, but not how I wanted to do them. I wanted to drive with my son the first time he got his drivers' license, things like that. There's things I can't do like play ball with them, um, you know certain things. I feel cheated on that." [Male, UC, MOS]

"My sister had a stroke a few years ago and it left her paralyzed on one side. I feel fortunate, you know, that that is when I started, you know, keeping track of my health. That as for diabetes, I'm overweight. So when my sister had her stroke, that's when I started to, you know, like 'Whoa', I have to do something about my health. My way of, um, the foods that I eat and like that. [prompt: did your sister have diabetes before she had the stroke?] Yes, she did, diabetes and high blood pressure." [Female, UC, AOS]

"My grandfather was much older when he got it [diabetes, and] he didn't take care of himself. Or like when he took what he wanted to feel happy, not

alcohol, just to say, a coke [soda] and he wasn't interested in the problems afterward. The difference what would it be? In that I try a little bit, I don't go on like that if I'm telling you correctly. I drink soda, but every now and then, or like a Coke and Coca Cola, only every now and then. It's the difference, being consistent with the illness and trying to overcome it." [Male, AC, AOS]

"Now it seems like, it's, you know, they [family members] try to let me know what I should eat, shouldn't eat, somewhat like my dad. They ask me 'cause he's diabetic too. My mom, she don't mention too much about it. I feel better, if they don't let me know what foods I shouldn't eat, but maybe I should start keeping a diet 'cause of my weight, my weight." [Male, UC, AOS]

When asked, "When you first found out you had diabetes, who was the

most helpful and how?" The family members of many participants offered their

own diabetes knowledge as support. One participant and his wife were given the

Food Guide Pyramid and other pamphlets on diabetic diets at the health clinic

prior to the interview. "Well my wife is trying to give me what the doctor gave me

for a guide, you see." [Male, AC, AOS]

A form of family support was in motivation and encouragement. For

example, "They were supportive, and told me to just keep going." [Male, UC,

AOS]

"My daughter Maria, took me to my appointments. She made sure that I was taking my medication. She made sure that I was eating properly and all that. She would come to the house every 2 or 3 times a week to check on me, see how I was doing. She helped me a lot." [Female, UC, AOS]

"Watching my sisters and what happened to my sister Susie; she's been diabetic for almost 20 years. She's never taken care of herself. My sister Jamie, she's been diabetic for about 10 years and she's just barely started about a year or 2 years ago start taking medication for it. They're not taking care of themselves. I look at them and see what they're doing and it's like don't you know, that scares me. So that puts me back straight, okay? You can go that way or this way. I'd rather go this way because what they're doing is not working." [Female, UC, AOS] "They [family] pull me [up] when they see that I'm doing bad. 'No Ma, one doesn't do that.' Then they are keeping up with my care, and they all are there to see what I do and don't do. 'To see family happy." Male, UC, MOS]

In this study, family, institutional and support from friends were found to

have an impact in the practice of self-management recommendations. The health

care institution or clinic offered information about diabetes. When asked, "When

you first found out you had diabetes, Who was the most helpful and how?" one

woman responded as follows.

"Oh, well just coming to the office, the doctor's office 'cause they kind of monitor how you're improving or going the other way. They kind of give you pointers. Kind of, 'Do this, gotta do that, kind of keep you aware that you have this illness. You have to control it, before it gets out of control. So, I think it's mainly the doctors." [Female, UC, AOS]

Most participants had positive comments about their experiences with

institutional care. A common response was to associate their experience at the

clinic as like being treated as family. When asked, "What is it about where you

go for health care that you like or dislike and why?" one participant responded as

follows.

"Well the doctor, I've been seeing him for almost three and a half years. He's a very good person. The nurses, they're very nice. They help you with any questions or anything that you need. If they can help you with it, then they will. And they'll talk to you like you're part of the family, not like you're my patient and I'm the doctor; you're the one paying me. Nothing like that, they're okay. Why do you think I'm still here?" [Female, UC, MOS]

"I come here and I like it 'cause I just tell them my problem--what's wrong with me. The doctor right away takes care of it and stuff." [Female, UC, MOS]

"I think we have very good relations here, the same with Dr. Cooke and the nurse who takes my respiration [pulmonary test]. With everyone, we have very good relations until now. They've very nice with us and caring with us. I mean, we feel a little bit in a family." [Male, AC, AOS] When asked, "When you need help with your diabetes, to whom do you

turn to and how do they respond?" participants relied on family support for

reminding to take medication. "Oh my husband helps me out. [How does he help

you?] Like if I need him to, you know, get my medicine or cook me something,

you know, he'll help me." [Female UC, AOS]

When asked, "When you first found out you had diabetes, who was the

most helpful and how?" participants relied on family support for transportation to

attend medical appointments.

"My son the oldest, he took me to the hospital, because I didn't know that I felt so bad. With a lot of thirst I need to go to the bathroom and desperation and it was that I had 'sugar'. They detected it. The third time I went, I would tell the doctor that I didn't feel any, any cure because I had a yeast infection. At that time I didn't, I don't know why I have this, and it doesn't go away with the medicine. So on the third time, the doctor did a urine analysis and sent me immediately, because I had it at 500, 475. I already felt really bad. [So your son helped you by taking you to the hospital?] Yes, he would go with me to the appointments, because I felt really bad. I didn't know what was going to happen, but I felt bad." [Female, UC, AOS]

When asked, "What do you think the role of doctor should be in helping

you with your diabetes?" Some responses were as follows.

"Just, um, well, just to help you like I said if you need to be under medication, be on top of the medications and steer you the right way in case you do get into a situation. Be helpful mainly." [Female, UC, AOS]

"Making sure that my diabetes is caught up, not caught up, but controlled. Like right now he just added more [increase in insulin dosage] and I'm like 'Oh, no'. Like how much to take in the needle you know." [Male, UC, AOS]

In some cases, family was the only source of support the participants had

available. "My wife, my kids that's all I have." [Male, AC, AOS]

"My daughter or my sister, Mary Anne. If my sugar is low, my daughter will run downstairs and get me some milk or juice or sugar water, something, so I can snap out of it and wake up and go get something to eat." [Female, UC, MOS]

"It's hard for me to control it sometimes, you know. They do it, like my dad took shots, and my mom took pills. I don't want to get to the stage where I have to take shots. So it's just I have to control it and I'm having trouble with that part." [Female, UC, MOS]

Another theme that emerged was social isolation. When asked, "How has

having diabetes changed how you act with friends?"

"Very little in that, because I don't have a lot of friends. I am very easily angered. They [sons] already know me, so they themselves don't pay attention to me. "Mom, calm down, calm down." But I do get thinking that I am easily angered. When I started with the sugar, and no, I try to be. [Were you more irritable?] Yes, I get like that. But they know and they don't pay attention to me or I get more angry, because they tell me to calm down. *Laughter.*" [Female, UC, AOS]

Some participants specified that their only source of support came from

family. "I just, I don't have, it's just me and my husband. I don't, I just go to work

and come home, you know. I associate with family, that's about it." [Female, UC,

### AOS]

The third theme that arose under social support was the influence of diabetes on daily life. One aspect in which diabetes affected the daily lives for those participants, who did maintain relationships with friends, was in social settings. They felt it was difficult to follow the diet in social settings such as parties. They were asked, "How has having diabetes changed how you act with friends?" and many responded similarly to this participant.

"Well, because they like to go out to eat. They like to do things like drink. Well, I don't drink because of my pancreas, because of the problem with my diabetes. And they think it's weird, because they're over there drinking their beers and I'm over here drinking diet Pepsi. I tell some. 'I don't drink, I can't drink'. You know and especially if I go to, go out to eat, I have to know how much what I'm eating, and if it's fried, boiled or steamed, because if it's grease, cooked by grease, I really cannot eat it then. If it's boiled, I probably can, because I have to watch the grease, fatty intake." [Female, UC, AOS]

The themes that emerged reflected the support offered by the health care institution in offering advice on self-management behaviors, treatment for disease management and knowledge about outside diabetes resources available such as pamphlets and hospital diabetes classes. The participants considered the doctor a resource for useful information regarding diabetes and self-management behaviors. The majority of participants had not participated in diabetes education, but most were aware that there was diabetes education available to them as shown in **Table 4.7**. There were underlying issues, however, for why some people with diabetes did not participate in the diabetes classes. Some participants had concerns about cost, lack of transportation, and for those who had had diabetes for a long time, the belief that they had more knowledge about diabetes than what the diabetes classes could offer.

A collaborative clinical care goal was elicited from a client when asked, "What do you think the role of doctor should be in helping you with your diabetes?" "His main role is kind of watch over that I keep--if he gives medication to make sure that I take it. If he tells me to do exercise, I should do what he recommends." [Female, UC, AOS]

Safety of their neighborhood emerged as a concern that could impact lives either positively or negatively. The participants' surroundings were important in how safe they felt in their community. Some participants did not

think that their location of residence, typically in the community near the clinic,

related to their disease management and others did.

"I don't think it does [do you think it would be different if you lived somewhere else?] not at all." [Male, UC, MOS]

"Here, I don't believe it's so calm. Because there are a lot of drugs around, so it's not calm. That the police maintains it's calm, well that's because they are keeping guard so there are no altercations." [Male, AC, AOS]

"Um, I don't feel safe. I think, me, not feeling safe, it just kind of makes everything kind of harder for me as far as trusting myself and trusting, um, my body how it feels sometimes. A lot of it with me has to do with my eyes 'cause at night time my eyes will play tricks on me and make me feel uncomfortable. With the new area we moved into, it's like I said, I don't, I'm not able to trust it or trust myself to feel comfortable." [Male, UC, MOS]

## 4.4 Revisiting the Objective of the Study

The objectives of the study were to 1) describe and contrast self-

management behaviors in Hispanic adults with physician diagnosed type 2

diabetes and who are either in acceptable (HbA1c < 8) or unacceptable glycemic

control (HbA1c  $\geq$  8) and 2) to determine if and how acculturation relates to self-

management behaviors (dietary adherence, regularity of exercise, taking

medication as prescribed, home blood sugar monitoring, weight control, and

visiting with the doctor and ophthalmologist once per year) and diabetes control

in Hispanic adults with physician diagnosed type 2 diabetes and who are either in

acceptable (HbA1c < 8) or unacceptable glycemic control (HbA1c  $\ge$  8). Of

specific interest were barriers and facilitators to achieving these recommended

behaviors. Through the exploratory qualitative questions and quantitative

biomedical markers, we were able to identify some of the challenges of self-

management of diabetes (diet, exercise, disability and safety) and some of the facilitators (support from family and health care provider).

#### **CHAPTER 5**

#### DISCUSSION

Key findings showed that the people with diabetes of Hispanic descent in this study had difficulty incorporating the ADA lifestyle change recommendations. Although most participants reported following a diet and exercise as facilitators to diabetes self-management, data from the dietary recalls demonstrated that overall, this group of participants did not follow the recommendations for diet and exercise. From the qualitative data, the poor adherence to exercise recommendations was related to the high proportion of disability in participants and a decreased sense of safety within the community. Support of family and the health clinic staff as well as understanding the complications of diabetes emerged as facilitators for diabetes management among this group of Hispanic adults.

### **5.1 Individual Factors**

Individual knowledge of diabetes, such as recognizing the disease progression and identifying complications were viewed as facilitators of self management and associated with glycemic control. In this study the inability of many participants to answer, "What is diabetes?" demonstrated a lack of knowledge that hinders behavior change, because good knowledge of diabetes enhances an individual's self-efficacy and facilitates behavior change (Sousa et al., 2004).

The concept of acculturation is important when interacting with Hispanic people in the United States, because it has been shown that risk factors for type

2 diabetes such as--diet, obesity, socioeconomic status, and health behaviors-differ for people at different levels of acculturation (Aldrich et al., 2000; Cantero et al., 1999; Hazuda et al., 1988; Neuhouser et al., 2004). In this study the differences in barriers and facilitators of self-management between the acculturation groups were subtle. For example, the AOS was more likely to perceive diet and exercise as a barrier than MOS. Distinctions between acculturation groups were most noticeable in the food choices reported on the dietary recalls. It is of interest that the ARMSAII scale identified only 14 as MOS of the 23 people who identified their origin as Mexican.

Similar to findings in a study that conducted focus groups with Mexican Americans (Coronado et al., 2004), participants in this study described diabetes as a "very serious, life-threatening illness." The focus group participants from Coronado's study in the state of Washington identified a diet high in fat, sugar or calories, lack of regular exercise and heredity as risk factors for diabetes. In another study, strong emotions such as fright (susto) were identified as a precipitator to diabetes onset (Coronado et al., 2004), but in the present study only one participant attributed their diabetes onset to "susto."

The findings of the present study are consistent with those from prior research by Caban et al. (2006) in that the participants placed more emphasis on symptoms of diabetes and less on biological characteristics versus European Americans who placed more emphasis on bio-psychosocial explanations. People more acculturated from the Mexican and Central Americans tended to place the emphasis on bio-psychosocial explanations like European Americans

(Caban et al., 2006). In a qualitative study conducted in San Antonio and Laredo, Texas, 93% of Mexican Americans attributed the cause of diabetes to genetics and poor diet (Hunt et al., 1998). Lifestyle factors such as substance use, alcohol, consumption, smoking, and not getting enough rest were associated with diabetes onset by 70% of participants (Hunt et al., 1998). Although the present study did not directly ask participants why they got diabetes, some people did indicate that older family members had diabetes, confirming a family history of diabetes.

### **5.2 Behavior/Lifestyle Factors**

Findings from the qualitative in-depth interviews demonstrated that these adults were not meeting the American Diabetes Association lifestyle recommendations for diabetes self-management (ADA, 2006), in regards to following the diet, getting physical activity and annually seeing an ophthalmologist. Those participants with poor glycemic control failed to limit carbohydrates to 50-55% of energy and saturated fat to 7% and to eat 25g fiber. Participants with acceptable glycemic control reported more fruits, salads and water compared to those unacceptably controlled, who reported more tortillas, pork products and more cultural foods. Dietary data was the only behavioral factor associated with acculturation. Consistent with other literature (Hubert et al., 2005; Neuhouser et al., 2004), the more AOS had a lower quality diet and were the least successful in self-management of diabetes as evidenced by a higher HbA1c compared with the MOS.

Participants recognized that healthy dietary choices such as water, salads and vegetables improved their well-being. Participants especially identified fruits and vegetables as helping them manage diabetes. Participants often referred to cultural foods as "Mexican food" describing such foods as barriers to selfmanagement. Because this group was getting services from a clinic that served patient with low incomes, it was not surprising that financial resources were a barrier when trying to obtain the right foods for diabetes management. The clinic was located in a neighborhood of mostly Hispanic people with few options for grocery shopping. Both factors are important influences on health outcomes for people with diabetes (Brown et al., 2004). Recent studies have clearly demonstrated an inverse relationship between diet quality and food costs (Drewnowski, 2004; Maillot, 2007). Researchers have demonstrated that nutrient dense foods like vegetables, fruits and meats have a higher cost per calorie compared to sweets and salted snacks suggesting that the low cost of energydense foods is a mediating factor in the association between poverty and obesity (Drewnowski, 2004; Maillot, 2007).

Although participants identified physical activity as a facilitator for diabetes management, there was no difference in time reported in physical activity between those in glycemic control versus those who were not (3.26 vs 3.01 hr/wk, respectively). Although both groups considered physical activity important and reported doing it, they also both identified disability as a common barrier. Disability poses a barrier for physical activity and is often associated with comorbidities of diabetes (Gregg et al., 2002; Stuck et al., 1999; Volpato et al.,

2003). This was true for the participants in the unacceptable control group, where disabilities included retinopathy that left people unable to self-monitor blood glucose and neuropathy that lead to amputation. For those in the acceptable diabetes control group, physical activity was mostly done at work; where as those in the unacceptable control group were more likely to be disabled. People in the present study suffered from a variety of disabilities that interfered with physical activity recommendations such as inability to walk, compromised vision and concern with unsafe neighborhood. In an elderly population of veterans disability was also an important barrier to self-management of diabetes (Murata et al., 2003), but this study is the first to report the common occurrence of disability among low income Hispanic adults with diabetes.

Participants viewed diabetic medications as facilitators to self management, demonstrating a reliance on medications to control diabetes over other self-management behaviors. Nevertheless, many participants found it difficult to remember to take medications.

Only 12 participants reported annual ophthalmology examinations for prevention and screening of retinopathy in the present study. The barrier for eye specialist visits for these participants was financial; about half of participants only had the county health insurance plan which did not include visits to specialists.

Few barriers to self-management behaviors the participants reported are easily addressed by interventions and none without expense. For example, financial aide would be necessary to extend health insurance to cover

ophthalmologist visits, provide physical activity for people with disabilities, and conduct food and nutrition education in the home for people on special diets with limited incomes.

### **5.3 Environmental Factors**

Environmental factors emerged with the participant's family and health care institutions as primary facilitators for self-management. On the other hand, the neighborhood in which they lived often emerged as a barrier for diabetes self management when it was a concern for safety, a finding supported in another study (Vincze et al., 2004).

#### 5.3.1 Family

Families were a reliable support when help was needed with diabetes as a major source of support offering encouragement, motivation and advice. For some, family was the only source of support. The participants sought out family members with diabetes for support, their knowledge of and experience with the disease progress, and for help recognizing disease complications, a finding also supported by previous research (Gleeson-Kreig et al., 2002). For a few participants in this study, however, family turmoil, such as small children not understanding the home care demands diabetes and having to care for a sick family member, made family feel more like a barrier than facilitator to self management of their disease.

### 5.3.2 Health Care Institution

These participants also identified their community health care providers and staff as a source of support. Participants in this study found that the staff at

the clinic were friendly, made them feel "like family" and provided educational reinforcement on diabetes management. That participants demonstrated their trust with their health care providers in the local clinic by returning for follow up care. Consistent with this finding, one study found that Hispanic people with chronic diseases were more likely to visit a doctor and return for care when they trusted the physician and medical advice (Larkey et al., 2001). Implications for health care professionals is that providing a comfortable, family-like environment in the health care setting can lead to better diabetes control if individuals feel that their health care providers treat them like family.

#### 5.3.3 Neighborhood

Most of the participants in this study lived the neighborhood proximal to the clinic. The ethnically diverse neighborhood includes many people of Hispanic descent. Living in close proximity to the clinic was facilitator for regular health care, but the same neighborhood was also a barrier to getting physical activity because it was perceived as unsafe. Literature demonstrates that the environment relates to general health outcomes (Brown et al., 2004) as found here. There was a lack of safe areas to walk and one participant reported hearing gun shots periodically. This study was also consistent with other research in finding barriers attributed to low income and the physical environment lacking access to affordable and accessible stores, restaurants, and recreation facilities (Kieffer et al., 2004).

#### **5.4 Implications for Practice**

Findings from this study have the following implications for future studies, health care practice and diabetes education. Health care professionals should acknowledge and include the patient's source of support into counseling and treating them. Participants in this study relied and trusted the resources available to them at the clinic, such as counseling offered by clinic staff as much as they relied on their own family members. This implies that health practitioners should adopt a personal approach when providing medical care to this population.

Diabetes education developed for Hispanic persons should include and encourage the involvement of family as part of the treatment and selfmanagement processes taught to achieve glycemic control, along with adopting a personal approach to counseling. Family based interventions for the treatment of diabetes have proved successful in improving glycemic control in both African-American and Mexican-American populations (Becker et al., 2005; Brown et al., 1995).

Incorporating cultural information and tailoring the interventions to address Hispanic persons with diabetes has shown positive outcomes on behavior change (Garvin et al., 2004) and is one that should be expanded. One study provided evidence for an effective Spanish language intervention aimed at a combination of chronic conditions (heart disease, lung disease and type 2 diabetes) into a single program, "Tomando Control de su Salud" (Lorig et al.,

2005). The lack of disease understanding and poor food choices found in the present study are areas culturally sensitive interventions should address.

Findings from this study imply there is a great need to find and develop innovative education programs tailored for people with disabilities in order to treat their chronic diseases. The importance of physical activity in combination with diet and medication working together for diabetes patients needs to be emphasized. To increase the physical activity in this population, it will be necessary to find innovative ways to incorporate physical activity into their lifestyle. Daily walking, house work and child care might be a few ways to encourage participants to include physical activity in their daily lives. Helping people with diabetes and disabilities to find access to transportation and financial aide is an important service to include in interventions for this population.

## 5. 5 Strengths and Limitations

This study was somewhat unique in using mixed methods to explore the relationship between acculturation and glycemic control in low-income Hispanic adults with type 2 diabetes. Qualitative in-depth interviews, quantitative data and the coding of data by two individuals was used to triangulate the data between what the participants said and what their actual biomedical markers indicated. This study is the first to our knowledge to identify that Hispanic adults with type 2 diabetes and limited incomes are likely to have physical disability and other diseases that act as barriers to physical activity. A major strength of this study is that the researcher was bilingual and bicultural and of the same ethnicity as participants. This contributed to the accuracy of language translation and

interpretation of data. The researcher's ethnicity and biculturalism helped build rapport with participants and clinic staff.

There were several limitations to this study. The small size and relative homogeneity of the sample might have been responsible for the lack of association between acculturation and glycemic control. That is the study was not adequately powered. Findings from this study cannot be generalized to all Hispanic people in the U.S. or even in Lansing, because this was not a random sample. As discussed in the next section, recruitment bias due to various factors like gender, time and the incentive clearly occurred.

### 5.6 Recruitment Challenges

During the recruitment period, only 5 persons approached at the clinic refused to participate, one female claimed she did not have diabetes even though it was clearly diagnosed on the chart and confirmed by the doctor. Two males refused to participate when the researcher approached each on a day when an undergraduate student accompanied the researcher (this student happened to be of different ethnicity of researcher and patients). The other two participants, both females, simply were not interested in participating. One patient signed consent forms to participate but could not stay to do the interview on that same day and the researcher was unable to follow-up due to incorrect contact information.

During the last phase of recruitment, finding unacceptably controlled males according to criteria was more difficult. The clinic doctor identified individuals who fit criteria and attempts by phone were made to recruit the final three participants. Of nine individuals identified, four had incorrect/non-working

phone numbers, one was not interested, two agreed to come in, but one was unable to make it due to transportation issues, and the other did not show up. Participants were more likely to be recruited while researchers waited at the clinic for patients to show up to their medical appointments. A daily appointment list available described what conditions patients were being treated for on the appointment date and made recruitment of participants more feasible.

Unacceptably controlled males seemed to come in to the clinic less than females and acceptably controlled males. One male agreed to participate, stating he had diabetes and went through the interview. The doctor then informed researcher that he had the same name as another patient who did have diabetes and the patient interviewed was a recovering alcoholic and drug addict who confirmed a diagnosis of diabetes to obtain an incentive. Clinic staff was vital in identifying potential participants and occasionally called researchers if they had a patient in the clinic when researchers were not there. Researchers also volunteered Spanish skills during waiting time for patients and helped translate for nurses who did not speak Spanish. When obtaining the 2<sup>nd</sup> diet recall, problems encountered were wrong phone numbers or numbers no longer in service. The best way to collect 2<sup>nd</sup> diet recalls was to have patient return to clinic or when patient returned for next appointment since some of them came in once a month.

Three interviews were conducted at home, these participants were recruited at clinic and wanted to participate but were unable to stay the same day. One participant was obese and could not sit down in the wheel chair for a

long time so she invited a researcher to her daughter's house where she was staying. Another participant lived 30 minutes outside of the city and could not stay to do the interview on the day of her appointment because she had her grandchildren with her. This participant also agreed to a home visit by a researcher to do the interview. The last at home interview was a male who could not stay at the clinic because he had another appointment and his whole family (wife and two children) were with him the day he was recruited.

#### 5.7 Conclusions

In summary, this is one of a small group of studies to provide a glimpse into the lifestyles of Hispanic adults with type 2 diabetes from families with limited incomes. A major finding of this study is that among those participants in the unacceptably controlled group, health concerns were confounded with socio demographic factors affecting daily life and the ability to make behavior changes. For example, some barriers for glycemic control were living in an unsafe neighborhood, having a physical disability and lack of financial resources to obtain food and medical necessities. Diet was impacted by acculturation. Participants in the acceptable glycemic control were more likely to eat salads, water and fruits and those participants in the unacceptable glycemic control group were more likely to choose tortillas, pork and fast foods. Thus diabetes education programs for this low-income population should aim to help these individuals reduce the barriers or finding innovative ways to overcome such barriers preventing the compliance with achieving recommended self-care behaviors.

**APPENDICES** 

APPENDIX A: SUMMARY OF	- NUTRITION RECOMMENDA	VTIONS 2006, AMERICAN DIABETES ASSOCIATION
Nutrient	Recommendation	Rationale
A dietary pattern that includes carbohy	drate from fruits, vegetables, whole g	rrains, legumes, and low fat-milk is encouraged for good health
Amount and type of carbohydrate	130g/day, low-carbohydrate diets, restricting total carbohydrates to < 130g/day, are not recommended in the management of diabetes	Amount of carbohydrate ingested is usually the primary determinant of postprandial response, but the type of carbohydrate containing foods on blood glucose also affects this response. Monitoring carbohydrate, whether by carbohydrate counting, exchanges, or experienced-based estimation remains a key strategy in achieving glycemic control. The use of glycemic index and load my provide a modest additional benefit over that observed when total carbohydrates is considered alone.
Fiber	≥ 5g fiber/serving, or ~50g fiber/day	<ul> <li>As for the general population, people with diabetes are encouraged to consume a variety of fiber-containing foods. However, evidence is lacking to recommend a higher fiber intake for people with diabetes than for the population as a whole.</li> </ul>
Sweeteners	Reduced calorie/non-nutritive sweeteners approved by FDA	<ul> <li>Sucrose-containing foods can be substituted for other carbohydrates in the meal plan or, if added o the meal plan, covered with insulin or other glucose lowering medications. Care should be taken to avoid excess energy intake. Sugar alcohols and nonnutritive sweeteners are safe when consumed within daily intake levels established by the Food and Drug Administration (FDA).</li> </ul>
Dietary fat and Cholesterol	<ul> <li>7% total calories from saturated fats</li> <li>200 mg/day dietary</li> <li>cholesterol</li> <li>2 servings of fish per week</li> </ul>	<ul> <li>The cardiovascular risk of individuals with diabetes is considered to be equivalent to that of non-diabetic individuals with pre- existing CVD. Intake of trans fats should be minimized.</li> <li>Fish provide n-3 polyunsaturated fatty acids and are recommended.</li> </ul>

2006, AMERICAN DIABETES ASSOCIATION (CONT'D)	Rationale	<ul> <li>For individuals with diabetes and normal renal function, there is insufficient evidence to suggest that usual protein intake should be modified.</li> <li>In individuals with type 2 diabetes, ingested protein does not increase plasma glucose concentrations but does increase serum insulin responses, and thus protein should not be used to treat acute or prevent nighttime hypoglycemia.</li> <li>High-protein diets are not recommended as a method for weight loss at this time. The long-term effects of protein intake &gt;20% of calories on diabetes management and its complications are unknown. Although such diets may produce short-term weight loss and improved glycemia, it has not been established that these benefits are maintained long term.</li> </ul>	<ul> <li>If adults with diabetes choose to use alcohol, daily intake should be limited to a moderate amount (one drink per day or less for women and two drinks per day or less for men).</li> <li>To reduce risk of nocturnal hypoglycemia in individuals using insulin or insulin secretagogues, alcohol should be consumed with food.</li> <li>In individuals with diabetes, moderate alcohol consumption (when ingested alone) has no acute effect on glucose and insulir concentrations but carbohydrate congested with alcohol (as in a mixed drink) may raise blood glucose.</li> </ul>	<ul> <li>Individuals with type 2 diabetes are encouraged to implement lifestyle modifications that reduce intakes of energy, saturated and <i>trans</i> fatty acids, cholesterol, and sodium and to increase physical activity in an effort to improve glycemia, dyslipidemia, and blood pressure.</li> <li>Plasma glucose monitoring can be used to determine whether adjustments in foods and meals will be sufficient to achieve blood glucose goals or if medication(s) needs to be combined with MNT.</li> </ul>
ITION RECOMMENDATIONS 2	Recommendation	15-20% of total energy	1 or 2 per day daily intake, les for women	<ul> <li>reduce intakes of:</li> <li>energy</li> <li>saturated and <i>trans</i> fatty acids</li> <li>cholesterol</li> <li>sodium</li> <li>increase physical activity</li> </ul>
SUMMARY OF NUTR	Nutrient	Protein	Alcohol	Specific for type 2 diabetes

# **APPENDIX B: PARTICIPANT CONSENT FORMS**

#### "Relation of Acculturation to Glycemic control and self-management of diabetes in Hispanic Adults" Participant Consent From

Investigators:	Lorraine Weatherspoon PhD, RD (517) 355-8464 ext. 136
	Sharon Hoerr, PhD, RD (517) 355-8474 ext. 110

Julie Plasencia (517) 355-8474 ext. 164

We invite you to participate in a research study that will help us understand how culture and where we live influences how Hispanic people manage their diabetes. Diabetes management practices include monitoring blood sugar, exercising regularly, following dietary recommendations, taking medications, visiting with doctor and visiting with an ophthalmologist.

This study consists of an audio taped interview that lasts about one hour, a review of your medical chart by Julie Plasencia, a graduate student in nutrition, and a follow-up phone call about food intake that will last about 30 minutes. There are no risks or discomforts associated with this research. All the blood work gathered will be information normally obtained by Cristo Rey Clinic for patients with diabetes. You will not benefit from your participation in this study, but your participation in this study may contribute to the understanding of the difficulties in managing diabetes.

Your participation is voluntary, you may choose not to participate at all, or you may refuse to participate in certain procedures or answer certain questions or discontinue your participation at any time without penalty or loss of benefits. Upon completion of the interview, a chart review and follow up phone call, you will receive a \$25 gift card to Wal-Mart in appreciation for your participation. Your privacy will be protected to the maximum extent allowable by law.

Your signature below indicates your voluntary agreement to participate in this study and that you are giving us permission to audio record the interview.

If you have questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact (anonymously, if you wish) - Peter Vasilenko, Ph.D., Director of Human Research Protections, (517)355-2180, fax (517)432-4503, email irb@msu.edu, mail 202 Olds Hall, Michigan State University, East Lansing, MI 48824-1047.

Print Name of the Subject:	
I will allow the interview be audio taped: Yes	No
Signature of Research Participant:	Date:
Signature of person obtaining consent:	Date:
#### "La relación de aculturación con el control de azúcar en la sangre y el control del diabetes en adultos Hispanos" Forme de Concentimiente del Participante

Forma de Consentimiento del Participante

Investigadores: Lorraine Weatherspoon PhD, RD (517) 355-8464 ext. 136

Sharon Hoerr, PhD, RD (517) 355-8474 ext. 110

Julie Plasencia (517) 355-8474 ext. 164

Esta invitado a participar en un investigación sobre las practicas que usas para controlar tu diabetes. Estas prácticas son cosas como chequear el nivel de azúcar, hacer ejercicio regularmente, seguir las recomendaciones alimentarías, tomar medicamentos, visitar al medico, y visitar con el oculistas.

Este estudio consiste de una entrevista grabada en audio caset que durara una hora, Julie Plasencia, estudiante de postgrado en nutrición, colectara datos en su expediente o carta medica y consecuentemente haremos una llamada telefónica en donde colectaremos un historial de alimentos consumidos por un día que durara aproximada mente 30 minutos. Este estudio no involucra incomodidades y todas las pruebas de la sangre serán exámenes que la Clínica Cristo Rey normalmente obtiene para sus pacientes. No tendrá ningún beneficio de resultado de su participación, pero su participación ayudara a comprender las dificultades que hay en controlar el diabetes.

Su participación es voluntaria, puede decidir no participar o puede decidir no participar en ciertas partes o contestar ciertas preguntas o descontinuar su participación sin cualquier penal o pérdida de beneficios. Su participación en este estudio es completamente voluntaria y seguirá recibiendo servicios médicos de la clínica si desea o no participar. Puede decidir no contestar las preguntas que no se siente cómodo. Si desea participar en este estudio y después decide descontinuar, puede retirar su consentimiento y descontinuar su participación. Recibirá una tarjeta con valor de \$25 a la tienda Wal-Mart por participar en el estudio si complete la entrevista, después que el investigador revise la carta medica, y complete el segundo registro de comida por teléfono. Su privacidad será mantenida a todo grado de la ley.

Su firma en esta forma indica que su participación es completamente voluntaria y nos da permiso de gravar la entrevista.

Si tiene preguntas o preocupaciones sobre sus derechos como participante o esta disatisfecho en cualquier aspecto de este estudio, puede comunicarse (anónimamente si deseas) con - Peter Vasilenko, Ph.D., Director of Human Research Protections, (517)355-2180, fax (517)432-4503, email irb@msu.edu, mail 202 Olds Hall, Michigan State University, East Lansing, MI 48824-1047.

Nombre de participante:		
Doy permiso que la entrevista sea grabada: Si	No	
Firma de participante:		
Firma de la persona que obtiene el consentimiento:		

#### **APPENDIX C: CLINIC APPROVAL**

Initial IRB

**Application** 

Approval

MIC	CHIGAN ST	<b>TATE</b>
U N April 22	IVERS 2, 2006	ΙΤΥ
То:	Lorraine WEATHER 334 Trout FSHN Bld MSU	SPOON g
Ré:	IRB # 06-238 Approval Date: Expiration Date:	Category: EXPEDITED 5,6 April 22, 2006 April 21, 2007

Title: RELATION OF ACCULTURATION TO GLYCEMIC CONTROL AND SELF-MANAGEMENT OF DIABETES IN HISPANIC ADULTS

The Institutional Review Board has completed their review of your project. I am pleased to advise you that your project has been approved.

The committee has found that your research project is appropriate in design, protects the rights and welfare of human subjects, and meets the requirements of MSU's Federal Wide Assurance and the Federal Guidelines (45 CFR 46 and 21 CFR Part 50). The protection of human subjects in research is a partnership between the IRB and the investigators. We look forward to working with you as we both fulfill our responsibilities.

Renewals: IRB approval is valid until the expiration date listed above. If you are continuing your project, you must submit an *Application for Renewal* application at least one month before expiration. If the project is completed, please submit an *Application for Permanent Closure*.

Revisions: The IRB must review any changes in the project, prior to initiation of the change. Please submit an **Application for Revision** to have your changes reviewed. If changes are made at the time of renewal, please include an **Application for Revision** with the renewal application.

Problems: If issues should arise during the conduct of the research, such as unanticipated problems, adverse events, or any problem that may increase the risk to the human subjects, notify the IRB office promptly. Forms are available to report these issues.

Please use the IRB number listed above on any forms submitted which relate to this project, or on any correspondence with the IRB office.

Good luck in your research. If we can be of further assistance, please contact us at 517-355-2180 or via email at <u>IRB@msu.edu</u>. Thank you for your cooperation.

Sincerely,

Pola R.

Peter Vasilenko, Ph.D. BIRB Chair

c: Sharon HOERR 204 GM Trout Bldg Dept FS & Human Nutrition Julie Plasencia 334 GM Trout Bldg Dept FS & Human Nutrition 

#### **APPENDIX D: CLINIC FLYER**

#### **Diabetes Interview**

We invite you to participate in a study designed to explore the selfmanagement practices of Hispanic persons with diabetes as influenced by society, culture and environment.

This study consists of an audio taped interview that lasts about one hour, a review of your medical chart for laboratory data, completed by investigator, and a follow-up phone call where we will collect one day's food intake. There are no risks or discomforts associated with this research. Your privacy will be protected to the maximum extent of the law during and after this research.

To be eligible, you must be: Over 18 years of age, Diagnosed with Type 2 diabetes, Are of Hispanic/Latino descent, You are a free-living, noninstitutionalized individual

As a thank you for your participation, you will receive a \$25 gift card to Walm-Mart

To participate in this study, contact Julie Plasencia at (517) 355-8474 ext 164 or indicate to the nurse or doctor that you are interested in participating in this study.

#### Entrevista sobre el Diabetes

Estas invitado a participar en un estudio sobre las practicas que usas para controlar tu diabetes.

Este estudio consiste de una entrevista grabada en audio caset que durara una hora, usaremos los datos en su expediente o carta medica y una llamada telefónica en donde colectaremos un historial de alimentos consumidos por un día. Toda información que tiene referencia su identificación será mantenida en confidencia a todo grado de la ley.

Para ser elegible, tiene que ser: De al menos 18 años, Diagnosticado con diabetes tipo 2, Descendientes Hipanos/Latinos, Independiente, no institucionalizado

Para dar gracias pos su participación, recibirá una tarjeta con valor de \$25 a la tienda Walm-Mart.

Para participar en este estudio, contacte a Julie Plasencia al telefono (517) 355-8474 ext 164 o indique a la enfermera o doctor que tiene interés en participar en este estudio. 

#### **APPENDIX E: INTERVIEW GUIDE**

#### **INTERVIEW GUIDE English**

ID Number\_\_\_\_\_

Date of Interview\_\_\_\_\_

#### **Demographic Information**

- 1) Gender: Male\_\_\_\_\_ Female \_\_\_\_\_
- 2) How long have you had diabetes?
- 3) How often do you visit the doctor in a year?
- 4) Who else in the family has diabetes? (grandparents, parents, siblings, children)

#### Medication

- 5) Do you take insulin shots?
  - (1) Yes \_\_\_\_\_
  - (2) No\_\_\_\_\_
  - (3) NA\_\_\_\_\_
- 6) Do you take diabetes tablets?
  - (1) Yes \_\_\_\_\_
  - (2) No\_\_\_\_\_
  - (3) NA\_\_\_\_\_
  - a) Do you have any problems taking diabetes tablets when you are supposed to do so?
    - (1) Yes \_\_\_\_\_
    - (2) No\_\_\_\_\_
    - (3) NA\_\_\_\_\_
  - b) What do you do if yes in 6b:
    - (1) Take it later\_\_\_\_\_
    - (2) Wait until the next medicine time\_\_\_\_\_
    - (3) Other (Specify)
- 7) Do you take other medications?

#### Monitoring

- 8) How often do you check your blood sugar at home?
- 9) Do you check it yourself? Who helps you check your blood sugar?
- 10) What interferes with our blood sugar testing at home?

- a) I don't know how to do it
- b) It hurts
- c) I don't like it
- d) Other (specify)
- 11) Do you follow any special diet? If so, what do you do? \_\_\_\_\_

Do you follow it:

- a) \_\_\_\_\_ all the time
- b) \_\_\_\_\_ sometimes
- c) \_\_\_\_\_ never
- 12) Do you exercise?
  - a) What do you do?
  - b) How long do you do it?
  - c) How many times per week?
- 13) Can you tell me what diabetes is?

#### Interview questions based on research questions:

1) How do cultural/social factors facilitate or inhibit the management of diabetes?

#### Family history of Diabetes

14) If they have relatives who had diabetes ask: How do you think having diabetes is different for you compared to your family member with diabetes?

#### **Relationship with family**

- 15) When you first found out you had diabetes, who was the most helpful and how?
- 16) Describe the different responses you received when you first told your family you had diabetes? Prompt – Can you give me an example? were they supportive of it? Did they help in your diabetes management? If so, how?
- 17) When you need help with your diabetes, to whom do you turn to and how do they respond? Prompt friends, family, doctor

#### 2) How do you subjects values and behaviors influence self-care practices of

#### diabetes?

#### **Behaviors**

- 18) Describe how having diabetes has changed your life. What do you do differently now? Prompt: after being diagnosed with diabetes? How has your daily routine changed?
- 19) How has having diabetes changed how you act with friends?
- 20) What have you been told is important in taking care of your diabetes? Prompt: How do you feel about that?

#### **Beliefs/values**

- 21) Describe some of the things you do well about managing diabetes and why? Prompt: Which of these do you do best?
- 22) Describe some things that you don't do well. Prompt: What makes it difficult for you to do this well?
- 23) What if any, are the advantages to managing your diabetes? Why?
- 24) What do you think the role of medicine is in managing diabetes? And What do you think the role of food is in managing diabetes? Prompt: Do you think that one is more important than the other?

#### Attitudes (barriers, facilitators)

- 25) What do you do on a daily basis to take care of yourself or your diabetes? Prompt: exercise, medical care, diabetes education school? What do you think is the best way for you to take care of yourself?
- 26) What would you like to do to be healthy?
- 27) What helps you in taking care of yourself? Prompt: What are some things that helped you manage your diabetes?
- 28) Are there any specific foods or other things that you believe help you with your diabetes? Prompt: What are they? Tell me how they/it helps you?
- 29) What keeps you from taking care of yourself? Prompt: What are some of the difficulties in managing your diabetes?
- 30) What is the most difficult thing about controlling your diabetes?
- 31) What is it about where you go for health care that you like or dislike and why?
- 32) What do you think the role of doctor should be in helping you with your diabetes?

#### 3) How does location influence the aspects of diabetes self-care practices?

#### Structure

- 33) Describe the community that you live in? Prompt: is it safe, tranquil, dangerous?
- 34) How does where you live affect how you can care for managing your diabetes? Prompt: How is it different from where you lived before?

#### Availability of resources (physical activity, medical assistance, dietary education)

- 35) Where and from when did you learn how to take care of yourself?
- 36) What organizations, groups individuals do you get helpful information from?
- 37) What has been the most helpful resource or thing for you?
- 38) Have you taken classes on diabetes? Prompt: If no, Do you know if diabetes education is available to you?
- 39) Anything else you want to tell me about your management of diabetes?

#### The Brief Acculturation Rating Scale for Mexican Americans-II

#### Modified by Julie Plasencia to include items 13-17.

(5) Almost Always/Extremely Often
(4) Much/Very Often
(Mainous et al.) Moderately
(2) Very Little/Not very Much
(1) Not at all

40) Do you speak Spanish	1	2	3	4	5
41) Do you speak English	1	2	3	4	5
42) Do you enjoy speaking Spanish	1	2	3	4	5
43) Do you associate with Anglos	1	2	3	4	5
44) Do you enjoy listening to English language movies	1	2	3	4	5
45) Do you enjoy Spanish language T.V.	1	2	3	4	5
46) Do you enjoy Spanish language movies	1	2	3	4	5
47) Do you enjoy reading books in Spanish	1	2	3	4	5
48) Do you write letters in English	1	2	3	4	5
49) Is your thinking done in the English language	1	2	3	4	5
50) Is your thinking done in the Spanish language	1	2	3	4	5
51) Are your friends are of Anglo origin	1	2	3	4	5
52) Do you talk to friends and family in your country of origin.	1	2	3	4	5
53) Do you talk to friends and family in the United States.	1	2	3	4	5
54) Do you use traditional medicines/home remedies to care for diseases and sicknesses	1	2	3	4	5
What is your country of origin/ethnic origin is: Mexico Puerto Rico Dominican Republic Cuba Argentina Columbia Peru Guatemala El Salvador Costa Rica United States					

#### **Demographic Information**

- 55) How many consecutive years have you lived in the United States?
- 56) What is the highest grade of education you attained?

57) What country did you attain your education?

58) With whom do you live?

- a) \_\_\_\_Alone
- b) \_\_\_\_\_With spouse
- c) \_\_\_\_With children
- d) \_\_\_\_With relatives
- e) \_\_\_\_Other (specify

59) What is your Marital Status, are you

- a) \_\_\_\_\_ Single
- b) \_\_\_\_\_ Married
- c) \_\_\_\_\_ widowed
- d) \_\_\_\_\_ Divorced/separated

60) What is your Employment status, are you

- a) \_\_\_\_\_ employed (full time)
- b) \_\_\_\_\_ employed (part time)
- c) \_\_\_\_\_ disabled, unable to work
- d) \_\_\_\_\_ homemaker
- e) \_\_\_\_\_ unemployed
- f) \_\_\_\_\_ retired
- g) \_\_\_\_\_ student
- h) \_\_\_\_\_ other (specify):
- 61) On a scale of 1 (very poor) to 5 (very rich), how would you describe your family's income/money status:
  - a) \_\_\_\_\_Very less money (very poor)
  - b) \_\_\_\_\_ Less money
  - c) \_\_\_\_\_ Enough money
  - d) \_\_\_\_\_ More than enough money
  - e) \_\_\_\_\_ Lots of money (very rich)

62) Date of Birth \_ \_/\_ \_/\_ \_ \_

#### INTERVIEW GUIDE Spanish (Guia de Entrevista Español)

Numero Identificador\_\_\_\_\_ Fecha de entrevista\_\_\_\_\_

#### **INFORMACION DEMOGRAFICA**

- 1) Género: Hombre\_\_\_\_\_ Mujer \_\_\_\_
- 2) Cuanto tiempo a tenido diabetes?
- 3) Cuantas veces por año visita al doctor??
- 4) Quien mas en la familia tiene diabetes? (abuelos, padres, hermanos / hermanas, hijos)

#### MEDICAIONES

- 5) Toma usted inyecciones de insulina?
  - (1) Si
  - (2) No
  - (3) NA\_
- 6) Toma usted pastillas / tabletas para el diabetes?
  - (1) Si \_\_\_\_\_
  - (2) No\_\_\_\_
  - (3) NA\_\_\_\_
  - a) Usted tiene problemas o dificultades en tomarse sus tabletas para el diabetes al tiempo que debe tomarlas?
    - (1) Śi \_\_\_\_\_
    - (2) No\_\_\_\_
    - (3) NA\_\_\_
  - b) Si contesto si a 6b, Que hace?:
    - (1) \_\_\_\_\_ Tomarla después
    - (2) \_\_\_\_\_ Se espera hasta la próxima ves que se la debe tomar
    - (3) \_\_\_\_\_ Otro (especifique)
- 7) Toma otros medicamentos?

CONTROLANDO SU DIABETES

- 8) Que tan seguido se mide la glucosa en la sangre cuando esta en casa?
- 9) Se la mide usted mismo/a? Quien le ayuda a medirse la glucosa en la sangre?
- 10) Que interviene o causa dificultades en medirse la glucosa en la sangre cuando esta en su casa?
  - a) No se hacerlo
  - b) Me duele
  - c) No me gusta
  - d) Otro (especifique)
- 11) Sigue alguna dieta especial? Inducir: que es lo que hace, descríbamelo.

Sigue estas indicaciones:

- a) Todo el tiempo
- b) \_\_\_\_\_ a veces
- c) \_\_\_\_\_ nunca
- 12) Hace ejercicio?
  - a) Que hace para ejercicio?
  - b) Cuanto tiempo lo hace?
  - c) Cuantas veces por semana lo hace?
- 13) Me puede decir que es el diabetes?

#### Guía de entrevista basada en preguntas sobre la investigación.

#### Preguntas para la entrevista basadas en las preguntas de la investigación:

#### I) Como facilitan o suprimen los elementos culturales y sociales su manejo del

#### diabetes?

#### Estructura

- 14) ¿Cómo describe usted su vecindad? (Inducir: es seguro, peligroso, agradable)
- 15) Piensa usted que su cuidado del diabetes y su control es peor o mejor por el lugar en donde usted vive? (Inducir: ¿Cómo seria el cuidado y el control si viviera en otro lugar? Deme un ejemplo.)

#### Antecedentes familiares y la diabetes

- 16) Si contesto que alguna otra persona en su familia tiene diabetes, pregunte: Cómo piensa que es diferente para usted que su familiar que tenia/tiene diabetes?
   Relación con la familia
- 17) Cuando se dio cuenta por primera ves que tenia diabetes, quien en su familia le ayudo y en que manera fue esa ayuda?
- 18) Cuales diferentes respuestas recibió cuando le dijo a su familia que tenia diabetes? (Inducir: Me puede dar un ejemplo? Le dieron apoyo? Como le ayudaron a controla su diabetes?)
- 19) Cuando necesitaba ayuda para cuidar a su diabetes, con quien volteaba para ayuda y apoyo? (Inducir: familia, amigos, vecinos, doctor?)

#### How do you subjects values and behaviors influence self-care practices of

#### diabetes?

#### Comportamientos/Maneras

- 20) Como le ha cambiado la vida el diabetes? Que cosas hace diferente ahora? Inducir: después ser diagnosticado con diabetes, como ha cambiado su rutina diaria?
- 21) Como el diabetes le ha afectado la interacción con sus amigos?
- 22) Que le han dicho es importante para controlar su diabetes? Inducir: que opina usted sobre eso?

#### **Creencias y Valores**

- 23) Que son algunas de las cosas que hace bien en controlar su diabetes y porque? Inducir: cual hace usted mejor?
- 24) Describa algunas cosas que no hace bien. Inducir: Que dificultad tiene para hacerlo bien?
- 25) Que ventajas si es que las hay, ve usted en controlar su diabetes?
- 26) Que opina usted sobre la función de la medicina en el control del diabetes? Y Que opina usted sobre la función de la comida en el control del diabetes? Inducir: Piensa usted que uno es mas importante que el otro?

#### **Actitudes (Barreras y Facilitadores)**

- 27) Que hace diariamente para cuidarse a si mismo y a su diabetes? Inducir: ejercicio, medicamentos, tomar clases sobre el diabetes Que piensa usted es la mejor manera de cuidarse?
- 28) Que le gustaría hacer para estar saludable?
- 29) Cuales son algunas de las cosas que le ayuda a controlar su diabetes?
- 30) Hay algunas comidas o otras cosas que usted cree que le ayudan con su diabetes? Inducir: Cuales son y como le ayudan?
- 31) Que le detiene para cuidarse? Inducir: Cuales son algunas dificultades que tiene en controlar su diabetes?
- 32) Que es lo mas difícil para usted para controlar su diabetes?
- 33) Que es lo que le gusta o no le gusta de lugar donde consigue sus servicios médicos?
- 34) Que piensa usted es el papel que debe jugar su doctor o el centro de diabetes en ayudarle con su diabetes?

#### How does location influence the aspects of diabetes self-care practices?

#### Availability of resources (physical activity, medical assistance, dietary education)

- 35) En donde y de quien aprendió a cuidarse? (Inducir: que tipo de información obtuvo)
- 36) De que organizaciones o grupos obtuvo información útil? (Inducir: clínica, doctor, amigos, y en que manera fue útil?)
- 37) Cuál ha sido el recurso mas útil para usted?
- 38) Ha tomado clases sobre el diabetes? Inducir: Si no, Sabe usted si hay educación sobre el diabetes disponible para usted?
- 39) Alguna otra casa sobre su diabetes que me quiera decir?

#### The Brief Acculturation Rating Scale for Mexican Americans-II

#### Modified by Julie Plasencia to include items 13-17.

(5) Muchísimo, casi todo el tiempo					
(4) Mucho o muy frequente					
(Mainous et al.) Moderado				ł	
(2) Un poquito o a veces					
(1) (Nada)	_				
	Ļ	Ļ	Ļ	↓ ↓	Ļ
40) Usted habla Español	1	2	3	4	5
41) Usted habla Inglés	1	2	3	4	5
42) Le gusta hablar Español	1	2	3	4	5
43) Se asocia con Anglos	1	2	3	4	5
44) Le gusta ver películas en Inglés	1	2	3	4	5
45) Le gusta ver programas en la televisión	1	2	3	4	5
que sean en español					
46) Le gusta ver películas en Español	1	2	3	4	5
47) Le gusta leer en Español	1	2	3	4	5
48) Escribe (como cartas) en Inglés	1	2	3	4	5
49) Sus pensamientos ocurren en el idioma Inglés	1	2	3	4	5
50) Sus pensamientos ocurren en el idioma Español	1	2	3	4	5
51) Sus amigos recientes son Anglo Americano	1	2	3	4	5
52) Usted platica con amigos y parientes en el país de su origen	1	2	3	4	5
53) Usted platica con amigos y parientes en estados unidos	1	2	3	4	5
54) Usted usa remedios caseros / hierbas medicinales para curar cuidar enfermedades	1	2	3	4	5
Su país de origen/ origen étnico: Mexico Puerto Rico Dominican Republic Guatemala El Salvador Costa Rica United	Cuba d States	Argentina	Columb	bia Peru	

#### Educación

55. Cuantos anos consecutivos ha vivido en Estados Unidos?

- 56. Cual es el grado mas alto de educación que obtuvo?
- 57. En que país consiguió su educación?
- 58. Con quien vive ahora?
  - Solo 1.
    - Con esposa/esposo 2.
    - Con Hijos З.
    - Con parientes 4.
    - 5. Otro (especifique)
- 59. Cual es su estado civil, es
  - Soltero/a 1.
  - 2. Casado/a
  - 3. Viudo/a
  - 4. Divorciado/a o Separado/a
- 60. Cual es su estado de empleo, es
  - \_\_\_\_\_ empleado (tiempo completo) 1.
  - empleado (medio tiempo) 2.
  - incapacitado, no puede trabajar 3.
  - ama de casa 4.
  - desempleado 5.
  - \_\_\_\_ jubilado 6.
  - estudiante 7.
  - Otro (especifique) 8.
- 61. En una escala de 1 (muy pobre) a 5 (muy rico), como describe el ingreso de su familia?
  - Muy poco dinero (muy pobre) 1.
  - 2. \_\_\_\_ Menos dinero

  - Suficiente dinero
     Mas que suficiente dinero
  - 5. \_\_\_\_\_ Mucho dinero (muy rico)
- 62. Fecha de nacimiento \_ / \_ / \_ \_ \_ \_

#### 24-Hour Dietary Recall 5-Step Approach

Getting started

- Break the ice
- Explain why the assessment is being done
- Reassure the subject this will be kept confidential

USDA 5-Step Approach

- 1. Quick List Collect a list of foods and beverages consumed the previous day
- What was the 1st thing you ate after you got up yesterday?
  - Avoid terms like breakfast or lunch
- Record only food at this time; don't worry about portion sizes until later
- Allow extra space for adding things later
- Do NOT interrupt
- 2. Forgotten Foods Probe for foods forgotten during the Quick List
- Your turn to talk
- Probe with open ended questions (how, what, describe)
- Don't forget...
  - o **Čondiments**
  - o Beverages
  - o Alcohol
  - "Little bites" of food
  - Frequently missed foods
- 3. Time & Occasion Collect time and eating occasion for each food
- Review the day to them
- Ask the subject to tell you the time of day each food was eaten
- Ask if there are additions or corrections

4. Detail Cycle – For each food, collect detailed description, amount, and additions. Review 24-hour day

- Obtain 4 kinds of info about each food/beverage
- Kind of food/Beverage
  - o Fresh, frozen, canned
  - o Skim, 2%, whole
- Preparation of food
  - o Fried or baked
  - o Ingredients added
- Portion size of food
  - o Participant may underestimate so use models or examples
    - o Make sure EVERY item has some measuring unit
- How served
  - o Butter, gravy, or cream added?
- If you are not sure about a food, ask the participant to describe it to you
  - For example, Joe tells you he has a Gatorade® every morning after breakfast
  - Find out what is a Gatorade®...
    - Is it a drink?
    - An energy bar?
- Get details (color, ingredients, etc)
- Your mom's BBQ is not going to be the same as his/her mom's
- Record dietary supplements or vitamins/minerals
- Record any herbal or home remedies
- 5. Final Probe Final probe for anything else consumed
- Remember...
  - o Double-check name on each dietary assessment form
  - o Check for completeness

#### 24-Hour Recall Sheet

Q1. How many times/week do you eat meals with your family?

Q2. How many times/week do you eat breakfast?

Time of the Day	Food Items	Amount/Portion	What were you doing?	Where were you eating?
				,

"Do you have a problem with digesting fluid milk?" yes or no

"Was this a normal day?" yes or no

#### Historial de Alimentos Consumidos por un Día

Comenzando

- Rompe el hielo
- Explica porque este colectando esta información
- Asegura la persona que esta información será confidencial

USDA 5 Step Method (Método de 5 pasos)

- 1. Lista inmediata Colecciona una lista de comidas y bebidas consumidas el día pasado.
- Que fue la primera cosa que comió ayer cuando se levanto?
  - Evita palabros come desayuno y almuerzo
- Anota solo las comidas, después anotaras las porciones
- Deja espacio para agregar mas información después
- No interrumpas
- 2. Comidas olvidadas Pregunta sobre estas comidas durante la lista inmediata.
- Es tu turno para hablar
- Examina con preguntas abiertas (como, que y describe)
- No olvides...
  - o Condimentos
  - o Bebidas
  - o Alcohol
  - o "pequeñas mordidas" de comidas
- Comidas frecuentemente olvidadas
- 3. Tiempo y ocasión Colecciona tiempo y ocasión para cada comida.
- Repite el día a la persona
- Pregunta el tiempo del día que cada comida fue consumida
- Pregunta si hay algo adicional o si hay que corregir algo
- 4. Detalles Para cada comida, colecciona descripciones con detalles y agregaciones. Revisa el

día.

- Obtén 4 tipos de información para cada comida y bebida
  - Tipo de comida / bebida
    - o Fresca, congelada, en lata
    - o Leche entera o sin grasa
  - Preparación de comida
    - o Frito o al horno
    - o Ingredientes agregados
- Tamaño de la porción
  - o Participante pueda menospreciar, usa modelos o ejemplos
  - o Asegúrate que cada comida tenga una unidad medidora o cantidad
- Come fue servido
  - o Con mantequilla, crema, salsa
- Si no estas segura sobre que es una comida, pide al participante que te lo describa
  - o Por ejemplo, José te dice que se toma una fresca cada mañana
  - o Pregunta a que se refiere cuando dice fresca
    - Es una bebida?
- Consigue detalles (color, ingredientes, etc.)
  - Una comida conocida no siempre esta hecha igual
- Anota cualquier suplemento, vitaminas o minerales
- Anota cualquier hierba o remedios caseros que tomen
- 5. Ultima examinación Has una ultima examinación por cualquiera otra cosa consumida.
  - Recuerda...
    - o Revisa que el nombre este correcto en la forma
    - Revisa que tengas la información completa

#### Historial de Alimentos Consumidos por un Día

P1. Cuantas veces por semana comes la comida con la familia?

P2. Cuantas veces por semana desayunas?

Tiempo del día	Comidas	Porciones	Que actividad estabas haciendo?	En que lugar lo comiste?

Tienes problemas para digestionar leche? (si o no) Este fue un día normal para usted? (si o no)

#### **APPENDIX F: LABORATORY DATA ABSTRACTION FORM**

Relation of acculturation to glycemic control and self-management of diabetes in Hispanic **Adults** Study Site: Date Abstracted: Subject I.D.: Reviewer: Supervising Physician: Date of Birth: \_ \_/\_ \_/\_ \_\_\_ Most Recent Date of Exam: \_ /\_ /\_ \_\_\_ Date of diagnosis: \_ \_/\_ \_/\_ \_\_\_ Duration of disease \_\_\_\_\_ No. of years Type of insurance: \_\_\_\_None (0) \_\_\_\_Medicare (1) \_\_\_\_Medicaid (2) Private HMO (Mainous et al.) PPC (4) Number of clinic visits in the past year \_\_\_\_\_ Number of hospitalizations in the past year \_\_\_\_\_ Family History: 1. Diabetes Mellitus N(0) \_Y(1) Father(1) Mother(2) \_\_\_Grand Parent(Mainous et al.) Sibling(4) 2. Coronary Art Dz \_\_N(0) \_\_Y(1) Father(1) Mother(2) \_Grand Parent(Mainous et al.) Sibling(4) Social History: 3. Tobacco \_\_N(0) \_\_Y(1) packs per day \_\_\_\_\_ 4. Alcohol \_\_N(0) \_\_Y(1) Last drink 5. Exercise \_\_N(0) \_\_Y(1)

#### 6. Pop w/ sugar\_\_N(0)

\_Y(1)

Physical Examination: (for past year or at least one date prior to most current available)

Date	Height (feet and inches)	Weight (pounds)

Laboratory Data: (for past year or at least one date prior to most current available)

HbA1c	Date
Microalbumin	Date

Cholesterol

Date	Total	LDL	ΤG	

7. Any medical problems besides diabetes as noted on chart

\_\_N(0)

\_\_Y(1)

\_\_\_\_\_ High Blood pressure

\_\_\_\_\_ Heart disease

- \_\_\_\_\_ Kidney problems
- \_\_\_\_\_ Overweight
- \_\_\_\_\_ Eye Problems
- \_\_\_\_\_ Nerve Problems
- \_\_\_\_\_ Other (specify)

#### APPENDIX G: CODEBOOKS FROM RESEARCHER (PLASENCIA) AND

#### **RESEARCH ASSISTANT (MURTHA)**

Code book of interview questions and frequent responses (Julie Plasencia)

#### 13) Can you tell me what diabetes is?

Code Number	n	Description
13-1	9	don't know
13-2	4	some understanding, no scientific explanation
13-3	4	can offer more detail, some scientific explanation
13-4	10	no specific explanation
13-5	1	pain in the body
13-6	1	no answer
13-7	1	psychological
13-8	1	participant gets sick more often
13-9	1	sugar leaking
13-10	1	blood turns into water
13-11	1	bad diet habit
13-12	1	"susto" (fright)
13-13	1	family history
13-14	1	high sugar
13-31	4	has to do with blood
13-32	1	can lead to death
13-33	1	need to take care of self
13-34	2	related to pancreas
13-35	2	insulin
13-36	1	doesn't feel diabetes symptoms
13-37	1	unrelated answer
13-39	1	sugar goes up and down
13-40	1	like a cancer, you can't get rid of it
13-41	1	destroys people's lives

#### 14) Describe the community that you live in? Prompt: is it safe, tranquil, dangerous?

Code	n Description
Number	•
14-1	4 noisy
14-2	8 calm
14-3	5 dangerous
14-3-1	1 hear gun shots
14-3-2	2 drugs
14-3-3	1 prostitution
14-3-4	1 store robbery
14-4	5 safe
14-5	3 busy
14-6	2 social isolation
14-7	2 nice
14-8	7 quiet

14-9	1 fine
14-10	1 neighbors know each other
14-11	1 regular
14-12	1 pleasant
14-13	1 stable
14-14	1 bad
14-31	2 regular
14-32	1 very pretty
14-33	1 community is economically slow

- 14-331 community is economically slow14-341 unable to work14-351 doesn't trust new neighborhood
- 14-36 1 difficult to get around because of vision problem

#### 15) How does where you live affect how you can care for managing your diabetes? Prompt: How is it different from where you lived before?

Code	n	Description
Number		
15-1	6	don't know
15-2	4	it does affect it
15-3	1	family
15-4	5	did not answer question
15-5	3	negative activity in neighborhood
15-6	12	no affect
15-7	1	was doing drugs
15-8	2	current is better than before
15-9	1	live more natural in Mexico
15-10	1	senior community with health care availability
15-11	2	normal
15-12	1	going upstairs is exercise
15-13	1	feel more calm
15-14	1	diabetes will always be there
15p-1	1	would be different if living somewhere else
15p-1-1	2	improvement from current
15p-1-1-1	3	safe
15p-1-1-2	1	calm
15p-2	8	no difference
15p-3	2	may be different
15p-4	1	improvement in health
15p-5	1	positive effect if financial situation would change, not place
15p-6	1	if there's more people it would be more boring
15p-7	1	current is worse than before
15p-8	1	less people
15p-9	1	quiet
15-31	1	feels unsafe

15-32 1 diabetes affected everything in life

### 16) *If they have relatives who had diabetes ask:* How do you think having diabetes is different for you compared to your family member with diabetes?

<u> </u>		
Code	n	Description
Number		
16-1	7	different
16-1-1	2	family
16-1-1-1	2	family member is less physically active
16-1-2	2	not as advanced as own
16-1-2-1	2	eye sight, own
16-1-2-2	1	amputations, own
16-1-3	2	don't see family
16-1-4	8	family's more advanced than own
16-1-4-1	1	eye sight
16-1-4-2	1	family member is on dialysis
16-1-5	1	different generation
16-1-6	1	he's younger than family member
16-2	3	not different
16-2-1	1	following the same treatment
16-3	3	don't know
16-3-1	3	they live elsewhere
16-4	4	more difficult to control own vs. family
16-5	1	complications
16-6	1	duration of diabetes
16-8	3	family member takes care of diabetes
16-10	2	no relatives w/ diabetes
16-11	2	family member has type 1 diabetes
16-12	1	family member followed strict
16-13	1	diabetes onset later in life
16-14	1	lack of consistency with diabetes self management
16-31	1	doesn't feel sick from diabetes
16-33	1	no answer
16-34	1	helps parents care for diabetes
16-36	1	was young when family member had diabetes
16-37	1	family member is overweight
16-38	1	feels weight loss helped control own diabetes
16-39	1	family member doesn't know what diabetes is
17) When you	ı fi	rst found out you had diabetes, who was the most helpful and how?
Code Number	n	Description
17-1	12	doctor

Code book of interview	v questions and	frequent responses	(Julie Plasencia)
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- 17-1-1 3 provide medication
- 17-1-2 3 provide advice
- 17-1-3 2 provide help for diet
- 17-1-4 1 explained what it was
- 17-1-5 1 explained what was happening
- 17-2 12 family
- 17-2-1 4 spouse
- 17-2-1-1 1 helps remind about shots and medicine
- 17-2-2 3 children were helpful
- 17-2-2-1 2 provided help for doctor appointments
- 17-2-2-2 1 provided help for medication

ovec book of interview questions and nequent responses (vulle ridgenera)
--

17-2-2-3	2 provided help for diet
17-2-2-3-1	1 did not like foods offered
17-2-3	2 children were not helpful
17-2-4	4 sibling
17-2-4-1	1 sister is a nurse
17-2-4-2	1 moral support
17-2-4-3	1 provided advice on foods
17-2-4-4	1 explained complications
17-2-5	2 parent
17-2-6	2 spouse provides most support
17-2-7	1 unable to provide knowledge of disease
17-3	4 nobody
17-4	2 provide knowledge of disease
17-4-1	1 diet
17-5	1 acceptance of diseases
17-6	1 provide knowledge of self-management
17-7	1 health insurance made health care possible
17-8	4 clinic
17-8-1	1 staff provides support
17-8-2	2 provide medication
17-9	1 put myself in god's hands
	-

# 18) Describe the different responses you received when you first told your family you had diabetes? *Prompt – Can you give me an example? were they supportive of it? Did they help in your diabetes management? If so, how?*

Code	n Description
Number	
18-1	7 lack of concern from family
18-2	6 family
18-2-1	8 advice
18-2-3	3 family member became upset/sad
18-2-3	1 family member offered knowledge for support
18-2-4	1 offered support
18-2-5	1 encouragement
18-3	3 no support from family
18-4	5 lack of knowledge to offer support
18-5	1 scared
18-6	5 surprised
18-6-1	1 nobody else in family has had it
18-7	1 not surprised, expected participant to get Dm
18-8	2 no concern
18-9	3 family is not in same location
18-10	1 take medicine
18-11	1 family did not understand why participant got Dm
18-12	1 reminded him about grandmother with diabetes
18p-1	13 support from family
18p-1-1	1 remind to see doctor
18p-1-2	3 offered advice on foods
18p-1-3	1 remind to take medicine
18p-2	1 took diabetes classes w/ family member

### 19) When you need help with your diabetes, to whom do you turn to and how do they respond? *Prompt – friends, family, doctor*

Code	n Description
Number	
19-1	10 Doctor
19-1-1	1 asks about diet
19-1-2	1 asks about self-glucose monitoring
19-1-3	2 prescribe medication
19-1-4	1 set up appointments
19-1-5	1 doctor has more patience
19-1-6	1 adjust medication
19-1-7	1 doctor uses diabetes as to why his leg hurts
19-1-8	1 feels like doctor doesn't listen
19-2	1 Hospital not helpful
19-2-1	1 don't know how hospital helps
19-3	1 confusion about treatment
19-4	11 family
19-4-1	6 spouse
19-4-1-1	1 gives medicine
19-4-1-2	1 cooks
19-4-1-3	1 offers knowledge about disease
19-4-2	7 children
19-4-3	1 lack of knowledge to offer support
19-4-4	5 sibling
19-4-4-1	2 offers knowledge about disease
19-4-5	2 offer advice on foods
19-4-6	1 parent
19-4-6-1	1 offers support
19-5	1 friends
19-5-1	1 friends offers support at work
19-6	1 offer food to correct condition
19-7	1 doesn't need help
19-8	1 government financial support
19-9	2 self
19-10	5 clinic
19-11	1 literature (pamphlets)
19-12	1 check sugar
19-13	1 watch diet/food
19-14	1 do exercise
19-15	1 feels like burden
19p-1	1 support b/c of work environment

### 20) Describe how having diabetes has changed your life. What do you do differently now? *Prompt: after being diagnosed with diabetes? How has your daily routine changed?*

Code n Number	Description
20-1 3	everything
20-1-1 1	lost everything

	_	
20-2	2	family
20-2-1	1	care for granddaughter
20-2-2	1	care for wife
20-2-3	1	wife
20-2-4	1	children
20-3	1	no cure for diabetes
20-4	12	change in diet
20-4-1	4	eat less
20-4-2	2	can't eat sweets
20-4-3	1	drink more water
20-4-4	2	don't drink alcohol anymore
20-4-5	1	avoid greasy foods
20-5	1	cannot do same things
20-6	1	work
20-6-1	2	not able to work anymore
20-7	1	accident, hit by semi-truck
20-8	3	exercise
20-8-1	1	cannot walk
20-8-2	2	tiredness
20-8-3	1	pain in feet
20-8-4	2	less physically active than before
20-9	2	weight loss
20-10	3	causes sadness/depression
20-11	1	negatively impacted socially
20-12	8	no change
20-13	1	kidney complications
20-13-1	1	less tolerating
20-14	2	eye sight complications
20-31	1	change in character
20-32	1	sexually
20-33	1	depression
20-34	1	disease is an inconvenience
20-35	1	disability
20-36	2	care for self more
20-37	1	easily angered
20-38	1	quit smoking
20-39	1	other condition causes depression/sadness
20-40	1	volunteers to get mind off health
20p-1	1	diet
20p-1-1	1	more salads
20p-1-2	1	stay away from sugar
20p-2	3	no change in daily routine
20p-2-1	2	slower paced routine
20p-3	1	everything is bothersome
20p-4	1	noise, is bothersome
20-41	1	giving self shots
20-42	2	blood glucose self monitoring
20-43	1	disrupts work
20-44	1	try to control as much as possible
20-45	1	complains of head aches and sore joints
20-46	1	taking medicine

#### 21) How has having diabetes changed how you act with friends?

Code	n Description
Number	
21-1	7 lack of social network
21-1-1	1 no friends after marriage
21-1-2	2 don't associate with friends
21-1-3	6 don't have friends
21-2	18 no change
21-3	1 family
21-3-1	4 only have family for support
21-3-2	2 spouse
21-3-3	1 children
21-3-4	1 doesn't rely on family for support
21-3-5	1 family structure broke down after death of grandparents
21-4	2 supportive
21-4-1	1 give advice
21-4-2	1 offer diet foods
21-5	4 change in diet habits in social setting
21-6	2 each individual has own problems to deal with
21-7	1 friendship is independent of disease
21-8	2 easily angered with people
21-9	2 keeps to self
21-10	1 tires easily when a round people
21-11	1 get mad for not drinking alcohol
21-12	1 don't drink alcohol
21-13	1 gets agitated at work more easily
21-14	1 feels hopeless
21-31	1 change in attitude

#### 21-32 1 found who real friends were upon diabetes onset

### 22) What have you been told is important in taking care of your diabetes? *Prompt: How do you feel about that?*

Code	n Description
Number	·
22-1	1 Dr. Suggestions
22-1-1	2 take care of self
22-1-2	1 tells of possible consequences
22-1-3	2 eye sight, blindness
22-1-4	1 bones start hurting
22-2	1 feel bad
22-3	3 complications
22-3-1	1 needs glasses
22-3-2	1 care for eyes
22-4	1 lack of money
22-4-1	1 doesn't have money to buy glasses
22-5	22 diet/food
22-5-1	3 avoid sweets
22-5-2	3 avoid greasy foods

22-5-3	1 eating more vegetables
22-6	10 exercise
22-7	1 amputations
22-8	1 lose life
22-9	1 nothing
22-10	7 medicine
22-11	2 care for feet
22-12	2 control sugar
22-13	1 can lead to death
22-14	1 living calm
22-31	2 lose weight
22-32	2 self-monitoring blood glucose
22-33	1 affects blood pressure
22p-1	1 clinic
22p-1-1	1 support
22p-2	1 Doctor
22p-2-1	1 support
22p-3	1 nurses
22p-3-1	1 support
22p-4	6 good
22p-5	1 mentally disabled
22p-6	1 good for one's health
22p-7	1 be more kind to people
22p-8	1 it's correct
22p-9	1 difficult to follow all indications
22p-10	4 difficult to follow diet
22p-10-1	1 difficult to follow diet because of work
22p-11	1 don't consider the indications
22p-12	1 diet is more expensive
22p-13	1 support from family is positive influence
22p-14	1 medicine keeps sugar in control
22p-15	1 it's important
22p-16	1 overweight makes sugar high
22p-17	1 feels unorganized about diabetes routine
22p-18	1 could use someone reminding about diabetes care
22p-19	2 scared of complications
22p-20	1 hard to cook differently
22p-21	1 taking medicine can be unpleasant
22p-22	1 doesn't want to hear about it

### 23) Describe some of the things you do well about managing diabetes and why? *Prompt: Which of these do you do best*?

Code	n Description
Number	•
23-1	1 take care of self
23-1-1	1 don't drink
23-1-2	1 less driving
23-1-2-1	1 tired vision
23-2	1 Doctor's suggestions
23-3	14 Diet

23-3-1	2	vegetables
23-3-2	5	eat less candy/sweets
23-3-3	3	less soda
23-3-4	1	eat less
23-3-5	1	avoid greasy foods
23-3-6	1	avoid sugary drinks
23-4	6	Exercise
23-4-1	2	walking
23-5	9	Take Medicine
23-6	1	lack of hope
23-7	5	self-monitoring blood glucose
23-8	2	don't do anything
23-9	1	daily organization
23-10	1	being calm
23-11	1	feels good
23-12	3	control diabetes
23-14	2	nothing
23-31	1	having more patience
23-32	1	rely on family for support
23-33	1	eating breakfast
23-34	1	weight management/loss
23-35	2	drink water
23-36	1	follow routine
23-37	1	salads
23-38	1	what is currently doing
23-39	1	life is boring
23-40	1	no longer working

23-41 1 fighting it

### 24) Describe some things that you don't do well. *Prompt: What makes it difficult for you to do this well?*

Code	n Description	
Number		
24-1	7 exercise	
24-1-1	3 walking	
24-2	8 diet/food	
24-2-1	1 lack of money	
24-2-2	1 difficult not to eat ice cream	
24-2-3	1 foods that contain sugar	
24-2-4	1 doesn't like salads	
24-2-5	1 drinking regular soda	
24-2-6	1 potato chips	
24-2-7	1 cakes	
24-3	6 medicine	
24-3-1	3 forget to take medicine	
24-4	1 unrelated answer	
24-4-1	1 takes care of self, does well	
24-4-1-2	1 work	
24-4-1-3	1 water	
24-4-1-4	1 no soda	

Coue book of interview questions and nequent responses (oune ridsencia)			
24-4-1-5	1	no sweets	
24-4-1-6	1	no sugar	
24-5	3	self-glucose monitoring	
24-5-1	2	forget, self-glucose monitoring	
24-5-2	1	problems with vision	
24-6	2	disability causes difficulties	
24-6-1	1	disability, forgetfulness	
24-7	1	mistreat people	
24-8	4	nothing	
24-9	1	don't sleep well	
24-10	2	don't know	
24-11	1	no answer	
24p-1	1	diet	
24p-1-1	1	loves Mexican food	
24p-1-2	1	Loves Italian food	
24p-2	2	exercise	
24p-2-1	1	walking is difficult, swelling	
24p-2-2	2	time	
24p-2-3	1	desire	
24p-3	1	pain in whole body	
24p-4	1	watching others eat (ice cream)	
24p-5	1	negative social pressure	
24p-6	1	craving for sweets	
24p-7	2	undesirable foods are readily available	
24p-8	1	participant likes to bake	
24-12	1	forgetful	
24-13	1	nerves get agitated	
24-14	1	making it to doctor's appointments	
24-31	1	likes sweet breads	
24-31-1	1	sweet breads are a weakness	
25) What if any, are the advantages to managing your diabetes? Why?			
Code	-	Description	
Number			
25-1	1	telling others	
25-1-1	1	telling others to get check ups	
25-2	1	doesn't know where he got it from	
25-3	1	dets upset at self	
25-4	Я	live longer	
25-5	2	family	
25-5-1	$\frac{1}{2}$	see own children arow up	
25-5-2	1	be a good spouse	
25-6	1	medicine	
25-6-1	1	only medicine helps	
25-6-2	2	get off medication	
25-6-3	1	not have to take insulin shots	
25-7	1	better life	

Code book of interview of	questions and frequent	responses	(Julie Plasencia)

5 live healthier 1 avoid amputations

2 scared of complications

25-8

25-9

25-10

- 25-11 1 avoid eye damage, further eye damage
- 25-12 2 helps stick to diet
- 25-13 1 prevent kidney damage
- 25-14 1 felt better at lower weight
- 25-32 1 nervousness contributes to overweight
- 25-32 1 be happy
- 25-33 1 not be burden to family
- 25-34 5 feel better
- 25-35 1 no anxiety
- 25-36 1 see the doctor regularly
- 25-37 2 don't know
- 25-38 1 don't get up all night for bathroom
- 25-391 wish it would go away
- 25-40 3 keep diabetes controlled
- 25-41 1 getting blood glucose down
- 25-42 1 being calm
- 25-42-1 1 being calm helps do everything right
- 25-43 1 work is a barrier to managing diabetes
- 25-44 1 cannot take food to work, construction sites
- 25-45 2 no advantages

## 26) What do you think the role of medicine is in managing diabetes? And What do you think the role of food is in managing diabetes? *Prompt: Do you think that one is more important than the other*?

Code	n Description
Number	
26-1-1	2 don't know much
26-1-10	1 prevent from getting higher or lower [blood sugars]
26-1-11	1 damages other organs
26-1-12	5 good
26-1-2	1 listen to doctor
26-1-3	10 to control diabetes
26-1-4	2 taking medicine on time
26-1-5	2 keep you alive
26-1-6	1 prevent hospitalization
26-1-7	1 tired of taking medicine
26-1-8	2 necessary
26-1-9	2 medicine works
26-1-10	1 prevent diabetic coma/shock
26-1-12	1 helps enough
26-1-11	1 has effect
26-2	4 don't know
26-2-1	2 likes a lot of foods
26-2-2	3 cultural foods considered barrier
26-2-2-1	1 tortilla
26-2-2-2	1 rice
26-2-2-3	1 brought up eating those
26-2-2-4	1 need meat in diet, otherwise individual angers
26-2-3	3 control, manage food intake
26-2-4	live longer

Code book of interview questions and frequent responses (Julie Plasencia)			
26-2-5	1 cooking differently, w/ less fat		
26-2-6	1 lack of money		
26-2-6-1	1 lack of money to buy vegetables		
26-2-7	3 food is positive		
26-2-8	1 family provides food		
26-2-9	1 necessary		
26-2-10	1 diabetes should only eat fruits, vegetables, and water		
26-2-11	3 food is negative		
26-2-11-1	1 all food is contaminated		
26-2-12	1 food is better than medicine		
26-2-13	1 greasy foods cause sugar to be high		
26-2-14	1 follow diet		
26-2-15	2 eat less		
26-2-16	2 control diabetes		
26-2-17	1 eat more vegetables		
26-2-18	1 feels bad when eating greasy foods		
26-2-19	1 if you follow diet it controls diabetes		
26-2-20	1 depends on who is cooking		
26-3	2 don't know		
26-3-1	4 medicine is more important		
26-3-2	2 food also important		
26-3-3	2 feels bad to have it uncontrolled		
26-3-4	18 both are important		
26-4	5 food and medicine work together		

26-5 3 food is more important

## 27) What do you do on a daily basis to take care of yourself or your diabetes? *Prompt:* exercise, medical care, diabetes education school? What do you think is the best way for you to take care of yourself?

Code	n	Description
Number		-
27-1	1	eat oats
27-1-1	4	eat less
27-2	8	exercise
27-2-1	1	dance
27-2-1-1	1	helps build self-esteem
27-2-2	4	walk
27-2-2-1	1	walking causes fatigue
27-3	11	take medicine
27-4	1	cook with less lard
27-5	5	nothing
27-6	4	self-monitoring blood glucose
27-8	2	eat breakfast
27-9	3	try to avoid certain foods
27-9-1	1	avoid desserts
27-10	1	not think about being on diet
27-11	1	rest
27-12	2	eat salad
27-13	3	work
27-14	1	follow routine

- 27-31 1 not having problems
- 27-32 1 drinking a lot of water
- 27-33 1 continue what currently doing
- 27p-1 less sugar in diet
- 27p-29 follow the diet
- 27p-2-1 1 eat vegetables
- 27p-2-2 1 eat fruit
- 27p-3 4 follow doctor's indications
- 27p-4 4 take medicine
- 27p-5 1 need reminder to take medicine
- 27p-6 2 continue what currently doing
- 27p-7 1 self-monitoring blood glucose
- 27p-8 1 care for self first versus family
- 27p-9 1 controlling nerves
- 27p-10 1 sit around
- 27p-11 1 exercise

#### 28) What would you like to do to be healthy?

Code	n	Description
Number		
28-1	1	can't do things because of diabetes
28-1-1	1	parties
28-1-2	1	drink beer
28-2	1	unrelated answer
28-2-1	7	not have diabetes
28-3	1	live healthy
28-4	1	see children graduate
28-5	1	see grand children
28-6	3	family
28-6-1	1	listen to parents when younger
28-7	1	get new pancreas
28-8	1	wants to talk to dietitian
28-8-1	1	will bet better explanation
28-46	1	plan meals better
28-9	9	exercise
28-9-1	1	difficult because of disability
28-9-2	1	lack of desire to exercise
28-10	1	be naturalist
28-11	1	take care of self more
28-12	1	with time
28-13	1	not have high blood pressure
28-14	1	not have depression
28-31	1	conscious of medicine
28-32	1	fix pain in legs
28-33	1	be physically able to get around
28-34	1	be younger
28-35	1	government should find a way to cure diabetes
28-36	1	have life back
28-37	1	have strength back
28-38	1	work again
- 28-39 1 loss of since diabetes
- 28-401 follow diet
- 28-41 1 relax
- 28-421lose weight
- 28-431 can only control it
- 28-44 1 doesn't understand food pyramid
- 28-45 1 not having to work
- 28-46 1 everything currently doing
- **28-47 1** go out more

### 29) What helps you in taking care of yourself? *Prompt: What are some things that helped you manage your diabetes?*

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Code Number	n	Description
29-1	3	foods
29-1-1	1	less sugar
29-1-2	2	less sweets
29-1-3	1	water
29-2	1	be more careful
29-3	2	be without stress or worries
29-4	1	be calm
29-5	1	walking
29-6	1	fresh air outside
29-7	6	medicine
29-8	1	taking food and medicine in orderly manner
29-10	3	don't know
29-11	5	exercise
29-12	1	feeling happy when it's controlled
29-13	1	diet
29-14	1	having a routine
29-31	1	using a notebook to write down self-monitoring blood glucose
29-32	1	unrelated answer
29-32-1	1	tires easily to do things
29-33	4	family
29-33-1	1	reminding to keep up with routine
29-33-2	3	offers support
29-33-3	1	thinking about future grandchildren
29-33-4	1	reminding of what not to do
29-33-5	1	parent's complications from diabetes
29-33-5-1	1	parent lost a kidney
29-34	1	depends on others to get around
29-35	1	clinic
29-36	1	stay away from pop
29-37	1	caring for grand daughter
29-38	1	own will power
29-39	1	looking at self in the future
29-40	1	not taking medicine or eat right doesn't help control diabetes
29-41	1	wants to control it to avoid complications
29-42	1	didn't exercise past winter
29-43	1	wants to be 130lbs when she is 50

- 29-44 1 knows is not currently healthy
- 29-45 1 eat natural
- 29-46 1 being controlled feels normal
- 29-471 not taking drugs
- 29-48 1 not drinking alcohol
- 29-49 2 not over eating
- 29-50 1 sleeping a lot
- 29-51 1 not having problems
- 29-52 1 controlling nerves as much as possible
- 29-53 1 nothing due to vision problem

### 30) Are there any specific foods or other things that you believe help you with your diabetes? *Prompt: What are they? Tell me how they/it helps you?*

Code	n Description	
Number		
30-1	1 facilitator	
30-1-1	3 foods	
30-1-1-1	10 fruits	
30-1-1-2	1 watermelon	
30-1-1-3	1 cantaloupes	
30-1-1-4	1 strawberries	
30-1-1-5	1 berries	
30-1-1-6	6 salads	
30-1-1-7	3 non-greasy foods	
30-1-1-8	1 rice cakes	
30-1-1-8-1	1 have no calories	
30-1-1-9	1 energizes	
30-1-1-10	1 tuna fish	
30-1-1-11	1 putting something good into body	
30-1-1-12	1 feels good	
30-1-1-13	2 low fat cottage cheese	
30-1-1-14	1 low fat yogurt	
30-1-1-15	1 diet foods	
30-1-1-16	1 pepper	
30-1-1-16-1	1 reason doesn't have a lot of diabetes	
30-1-1-16-2	1 doctor told her it cuts the disease	
30-1-1-17	2 cucumber	
30-1-1-18	1 lettuce	
30-1-1-19	1 tomato	
30-1-1-20	2 oatmeal	
30-1-1-21	1 black coffee	
30-1-2	1 didn't feel bad	
30-1-8	1 baked foods	
30-1-9	2 boiled foods	
30-1-10	1 steamed foods	
30-1-11	1 beans	•
30-1-12	1 tacos	
30-2	2 foods are not helpful	
30-2-1	1 ice cream	
30-2-2	1 cake	

30-31 never been on diet30-414 vegetables30-4-11 green beans30-4-21 green peas30-4-3carrots30-51 vitamins30-62 eat less30-71 no answer30-82 none30-101 all foods causes diarrhea30-111 needs change in medication30-121 eating vegetables keeps away from eating junk food30-131 change in eating habits30-341 feel good to be around people30-351 feel less scared30-362 eat Jell-O30-372 drink more water30-381 stopped eating tortillas30-392 feel better30-301 doesn't have diabetes symptoms30-412 gets full30-421 goods to overeat30-341 atraid of selling tortillas30-351 depends on family for support30-362 eat Jell-O30-372 foods help not to overeat30-412 gets full30-421 noodles30-431 avoids starch because it turn into sugar30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-441 feels leagt now30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low		
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30-372 drink more water30-381 stopped eating tortillas30-392 feel better30-401 doesn't have diabetes symptoms30-412 gets full30-422 foods help not to overeat30-431 avoids starch because it turn into sugar30-43-11 rice30-43-21 noodles30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-36	2 eat Jell-O
30-381 stopped eating tortillas30-392 feel better30-401 doesn't have diabetes symptoms30-412 gets full30-422 foods help not to overeat30-431 avoids starch because it turn into sugar30-43-11 rice30-43-21 noodles30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-37	2 drink more water
30-392 feel better30-401 doesn't have diabetes symptoms30-412 gets full30-422 foods help not to overeat30-431 avoids starch because it turn into sugar30-43-11 rice30-43-21 noodles30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-38	1 stopped eating tortillas
30-401 doesn't have diabetes symptoms30-412 gets full30-422 foods help not to overeat30-431 avoids starch because it turn into sugar30-43-11 rice30-43-21 noodles30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-39	2 feel better
30-412 gets full30-422 foods help not to overeat30-431 avoids starch because it turn into sugar30-43-11 rice30-43-21 noodles30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-40	1 doesn't have diabetes symptoms
30-422 foods help not to overeat30-431 avoids starch because it turn into sugar30-43-11 rice30-43-21 noodles30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-41	2 gets full
30-431 avoids starch because it turn into sugar30-43-11 rice30-43-21 noodles30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-42	2 foods help not to overeat
30-43-11 rice30-43-21 noodles30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-43	1 avoids starch because it turn into sugar
30-43-21 noodles30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-43-1	1 rice
30-443 feels healthier30-451 wants to be vegetarian, but lacks money30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-43-2	1 noodles
30-451wants to be vegetarian, but lacks money30-461help maintain eating regimen30-474keeps sugar low30-481feels light	30-44	3 feels healthier
30-461 help maintain eating regimen30-474 keeps sugar low30-481 feels light	30-45	1 wants to be vegetarian, but lacks money
30-474 keeps sugar low30-481 feels light	30-46	1 help maintain eating regimen
30-48 1 feels light	30-47	4 keeps sugar low
	30-48	1 feels light

# 31) What keeps you from taking care of yourself? *Prompt: What are some of the difficulties in managing your diabetes*?

Code	n	Description
Number		·
31-1	1	medicine
31-2	4	barrier, foods
31-2-1	1	cake
31-2-2	1	cookie
31-2-3	1	diet pop
31-2-4	1	bread
31-3	9	nothing
31-3-1	1	just take insulin
31-4	2	self
31-5	2	family

Code book of	in	terview questions and frequent responses (Julie Plasencia)
31-5-1	1	disabled son
31-5-2	2	forget about self to care for family
31-5-3	1	daughter won't give her greasy foods and she finds that difficult
31-6	2	eating greasy foods
31-7	1	physically unable to get around
31-8	3	not having enough money
31-9	1	forgetful in taking medicine
31-10	1	having diabetes is inconvenient
31-11	1	when sugar gets high
31-11-1	1	physically unable to get around
31p-1	1	selecting foods
31-12	2	stress
31-12-1	2	family causes stress
31-12-2	1	being safe
31-12-3	1	feels like burden to family
31-12-4	1	relatives don't not offer support
31-12-5	1	work causes stress
31-13	1	news on TV is stressful
31-14	1	fear of talking to strangers
31-31	1	lack of exercise
31-32	1	memory problems
31-33	1	laziness
31-34	1	lack of money
31-34-1	1	receives social security and food stamps
31-34-2	1	not enough money to buy right foods
31-35	1	nothing detains them
31-36	2	eating less
31-37	1	"gula" (what makes fat people fat)
31-37-1	1	can't stop eating harmful food
31-38	1	leaving too quickly
31-39	1	what you eat
31-40	1	cooking for whole family makes it difficult to avoid food
31-41	1	being scared
32) What is the most difficult thing about controlling your diabetes?		

Code	n Description
Number	·
32-1	4 physical barrier
32-1-1	2 vision problems
32-1-1-1	1 cannot read
32-1-2	1 cannot walk
32-1-3	1 cannot cook for self
32-1-4	1 not managing own affairs
32-2	1 can't do things he/she wants to do
32-3	8 following diet
32-3-1	1 work is a barrier to following diet
32-3-2	1 can't stop over eating
32-3-3	1 doesn't always know what they get
32-4	1 lack of transportation
32-5	2 don't know

Code book of interview questions and frequent responses (Julie Plasencia)			
32-6	2 self monitoring blood glucose		
32-6-1	2 pinch/poke		
32-7	1 time		
32-8	1 getting blood work		
32-8-1	1 afraid of what results show		
32-9	2 insulin shots		
32-10	2 nothing		
32-11	3 medicine		
32-12	1 no change in eating habits		
32-13	1 difficult to change eating habits in social settings		
32-14	2 exercise		
32-31	1 laziness		
32-32	1 trying to forget about having diabetes		
32-33	1 can't drink beer		
32-34	1 not eating meat		
32-34-1	1 always tempting to eat meat		
32-35	1 diabetes is always going to be there		
32-36	1 controlling my sugar		

32-36-1 1 body feels bad

### 33) What is it about where you go for health care that you like or dislike and why?

Code Number	n Description
33-1	7 positive, good treatment
33-2	7 Good doctor
33-3	1 barrier
33-3-1	1 cost of other health care
33-4	3 Clinic
33-5	7 everything is fine
33-6	1 don't need an appointment
33-7	3 dislike waiting
33-8	4 like the nurses
33-9	1 normal
33-10	3 close to home
33-11	2 doctor takes care of any problem
33-12	1 important to get blood work for other medical condition
33-13	1 no problems with it
33-14	3 feel like family
33-31	1 thank god for having the doctor
33-32	1 doctors are more concerned
33-33	1 doctor is direct about their health
33-34	1 likes everybody that works at the clinic
33-35	1 tried other doctors, still likes this clinic
33-36	3 feels they take good care
33-37	1 feels they take good care of children
33-38	1 can't get pain medicine for other disorder in neck
33-39	1 feels if she had private insurance she could get pain medication, Vicodin
33-40	1 trying to build muscle on back to improve pain in neck
33-41	1 doesn't want to end up on a wheel chair
33-42	1 fighting neck disorder for 10 years and is motivated to fight 30 more

- 33-43 1 feels comfortable
- **33-44** 1 doesn't like that people talk about the place
- 33-45 1 don't follow through
- 33-46 1 not everyone has insurance
- 33-47 1 no answer
- 33-481Routine check up
- 33-49 1 keep track of diabetes
- 33-50 1 dislikes seeing more than one doctor
- 33-51 1 feels it would be more personal to have one doctor
- 33-52 1 they listen
- 33-53 1 attention they give

### 34) What do you think the role of doctor should be in helping you with your diabetes?

Code Number	n D	Description
34-1	<b>4</b> G	Give advice
34-2	1 a	ask questions
34-1-1	6 te	elling what to do and what not to do
34-1-2	2 w	what not to eat
43-1-3	1 10	ose weight
34-3	2 m	nore information
34-4	1 m	nore attention
34-5	1 b	blood pressure checked
34-6	2 la	aboratory blood work
34-7	4 p	prescribing medication
34-8	3 d	lifficulty in following advice of doctor
34-9	1 ir	ndividual is barrier to allowing doctor to help
34-10	2 d	loctor is doing all he can
34-11	3 d	don't know
34-12	2 a	advising on how to take medicine
34-13	2 c	control diabetes
34-14	2 c	check blood sugar levels
34-31	1 m	nake sure I understand what is happening
34-32	1 ta	aken care of
34-33	1 c	linic
34-34	1 tr	reated well
34-35	1 e	explain what can happen
34-36	1 k	keep alive
34-37	1 e	educate
34-38	1 te	ell one they have it
<b>34</b> -39	1 h	nelp feel better
34-40	1 q	quickly attended
34-41	1 d	loctor having a chart
34-42	2 th	hey are doing their part
34-43	1 w	vas never sent to specialist as promised
34-44	1 d	loctor can only follow procedure
34-45	1 h	poing honost to patient

**34-45 1** being honest to patient

### 35) Where and from when did you learn how to take care of yourself?

Code	n Description	
Number		
35-1	12 Doctor	
35-1-1	1 Only doctor seen	
35-1-2	1 teaching about complications	
35-1-3	2 gave medicine	
35-1-4	1 indications for care	
35-2	6 Clinic	
35-2-1	2 teach to do self-monitoring blood glucose	
35-3	3 self	
35-4	1 diabetes classes	
35-4-1	1 diet	
35-4-2	1 take care of self	
35-4-3	1 care for cuts	
35-5	1 stopped caring for self	
35-5-1	1 child came home sick from military	
35-6	7 family	
35-6-1	4 parent	
35-6-1-1	1 advice to take care of self	
35-6-2	2 sibling	
35-6-3	2 spouse	
35-7	1 learned when parents got diabetes	
35-8	1 learned from hospital	
35-9	1 seeing complications on other people is motivating	
35-10	1 friends	
35-11	1 work	
35-11-1	1 deal with diabetic patients	
35-11-2	1 know what they can and cannot eat	
35-11-3	1 helps to focus on self	
35-12	1 nurses	
35-13	1 dietitian	
35-14	1 Being Mexican is barrier	
35-31	1 Doctor in another location	
35-31-1	1 best doctor they have had	
35-32	1 unrelated answer	
35-33	1 literature picked up at clinic	
36) What organizations, groups individuals do you get helpful information from?		
Codo	n Description	

Code book of interview questions and frequent responses (Julie Plasencia
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Code	n Description
Number	
36-1	9 none
36-2	7 Clinic
36-3	1 hospital programs offered at hotels
36-4	1 insurance information
36-5	3 Hospital diabetes classes
36-6-1	1 food
36-6-2	1 medicine
36-6-3	1 psychological
36-6-4	1 advantages of the illness
36-6-5	1 disadvantages of the illness

over book of interview questions and nequent responses (vene i lasencia)	Code book of interview (	questions and freq	uent responses	(Julie Plasencia)
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36-6-6	1 motivating to over come it
36-6	1 TV
36-7	2 literature at clinic
36-8	1 Medicaid diabetes classes
36-9	3 family
36-9-1	2 sibling
36-9-2	1 parent
36-10	10 doctor
36-11	1 walk for diabetes
36-12	1 friends
36-13	1 diabetes program at clinic
36-13-1	1 volunteering for the program
36-14	1 difficult to know what the right foods are but not have enough money
36-31	1 feels she wouldn't worry about high sugar if she had the right foods
36-32	1 diabetes magazine in the mail
36-33	1 American blind association

### 37) What has been the most helpful resource or thing for you?

Code	n Description
Number	
37-1	11 medicine
37-2	3 Insurance
37-3	8 clinic
37-3-1	1 allowed them to see doctor when money was scarce
37-4	6 family
37-4-1	1 parents
37-4-1-1	1 take care of each other
37-4-2	3 sibling
37-4-3	2 children
37-4-3-1	1 happiness of children
37-4-3-2	1 offer help when she is doing bad
37-5	8 doctor
37-5-1	1 advice
37-6	2 eating less
37-7	1 getting out of house
37-8	1 nobody
37-9	1 job
37-9-1	1 knowing what goes on the tray helps self
37-10	1 publications that apply to diabetes
37-11	1 seeing what family not take care of self
37-12	1 government
37-12-1	1 provided with wheel chair
37-12-2	1 provided with bed
37-13	1 being able to check sugar levels
37-14	1 having equipment to check sugar levels
37-31	1 garlic
37-32	1 grateful for the insulin given
37-33	1 don't know
37-34	1 seeing family in the future

### 38) Have you taken classes on diabetes? *Prompt: If no, Do you know if diabetes education is available to you?*

Code Number	n Description
38-1	19 no classes taken
38-2	10 no knowledge of classes available
38-3	10 yes, have taken class/es
38-3-1	1 disability doesn't allow to return to classes
38-3-2	1 didn't listen in diabetes class because was in denial
38-4	18 does have knowledge of classes available
38-5	2 concern with cost of classes
38-6	1 lack of transportation
38-7	1 went with family member
38-8	1 taught other about diabetes
38-9	1 has been told she knows more than the classes offer
38-10	1 eats certain foods
38-10-1	1 zucchini, radish, cabbage, carrots
38-11	was raised having enough milk, cheese, fish, shrimp, cucumber, watermelon,
	1 corn, melons
38-12	1 was raised poor but natural
38-13	1 reads magazines

#### 39) Anything else you want to tell me about your management of diabetes?

Code Number	n Description
39-1	1 no warning of diabetes
39-2	1 doesn't know why he got it
39-3	9 no further comments
39-4	1 medicine does work
39-5	1 care of self
39-6	2 care depends on self
39-7	1 worried about taking insulin shots
39-8	1 feels knowledgeable, but unable to follow through
39-9	1 diabetes is difficult
39-10	2 exercise
39-11	2 keep up with medication
39-12	1 wish it was gone
39-13	1 government should find medicine alternative to shots
39-14	1 doesn't know why can't walk
39-31	1 taking diabetes seriously
39-32	1 being Mexican
39-32-1	1 foods like tortillas and pop
39-33	1 food from work is good for self
39-34	1 not to be in denial
39-35	1 forgetful with medicine
39-36	1 has all resources necessary
39-37	1 easy to manage with organization
39-38	1 requires one puts desire into it

	or or interview questions and inequent responses (oune ridsentia)	
39-39	1 requires that one puts everything on their part for themselves	
39-40	1 I have received the best help	
39-41	1 doesn't have discipline	
39-42	1 not eating things that are bad	
39-43	1 follow procedures	
39-44	1 take medicine	
39-45	1 go to appointments	
39-46	1 remember patients have feelings	
39-47	1 listening does more good for some	
39-48	1 doesn't drink alcohol because of diabetes	

### 13) Can you tell me what diabetes is?

Code Number	Description
313-13-1	don't know
313-13-2	some understanding, no scientific explanation
313-13-3	can offer more detail, some scientific explanation

### 14) Describe the community that you live in? Prompt: is it safe, tranquil, dangerous?

Code Number	Description
313-14-1	noisy
313-14-2	calm
313-14-3	dangerous
313-14-4	safe
301-14-15	drug activity
314-14-16	pleasant, nice
315-14-17	quiet
320-14-18	difficult to get up stairs in house
320-14-19	busy
316-14-20	stable
325-14-21	problems with robbing
331-14-1-15	on weekends
330-14-22	old place friendly
330-14-23	not familiar with new community /people
330-14-24	difficult to see new surroundings
310-14-25	good neighbors
328-14-26	very pretty

# 15) How does where you live affect how you can care for managing your diabetes? *Prompt: How is it different from where you lived before*?

Code Number	Description
313-15-1	don't know
313-15p-1	would be different
313-15p-1-1	improvement from current
313-15p-1-1-1	safe
313-15p-1-1-2	calm
313-15p-2	no difference
301-15-15	Irritating
301-15-16	Upsetting
307-15-17	no effect
304-15p-15	dangerous neighborhood in past
304-15p-15-1	irritation causes high blood sugar
308-15p-16	drug use in past
320-15-18	currently problems with using stairs in house
327-15-19	live with family member who is diabetic
327-15-19-1	help each other with treatment
327-15p-17	would not be different
309-15-20	possibly could be different
330-15-21	feel unsafe

330-15-22	feel uncomfortable with surroundings
330-15p-18	easier to trust people in old community
330-15-23	feel uncomfortable with body
310-15-24	better in Mexico
310-15-24-1	lard, junk food in California
310-15-24-2	worked outside
310-15-24-3	gained weight in California
310-15-24-4	healthy culture/lifestyle
311-15-25	nurse close by at all times
317-15p-19	difference in financial situation
319-15p-20	better neighborhood in the past
326-15-26	more people would be more boring

### 16) *If they have relatives who had diabetes ask:* How do you think having diabetes is different for you compared to your family member with diabetes?

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Code Number	Description
313-16-1	different
313-16-1-1	family
313-16-1-1-1	brother less active
313-16-2	not different
301-16-15	Have longer
301-16-16	More complications
307-16-1-1-15	better diet control
307-16-1-1-16	lack of knowledge
34-16-17	easier
303-16-18	hard to control
304-16-19	in more danger
304-16-1-17	family more complications
304-16-20	fear of complications
308-16-21	take better control of self
308-16-1-18	family procrastinates
302-16-22	don't know
320-16-1-1-19	brother has different kind of diabetes
320-16-1-1-20	family controls well with medications
322-16-23	easier for patient
325-16-1-1-21	family has had longer
329-16-1-1-22	family controls blood sugar
329-16-1-1-23	family has problems
331-16-1-1-24	family has different type of diabetes
330-16-24	affects people differently depending on their age
311-16-1-1-25	family more strict diet
328-16-25	family does not take care of diabetes

### 17) When you first found out you had diabetes, who was the most helpful and how?

Code Number	Description
313-17-1	doctor
313-17-1-1	provide medication
313-17-2	family
313-17-2-1	wife helps remind about shots and medicine

301-17-2-15	wife
301-17-2-16	kids
307-17-1-15	give advice
315-17-15	unrelated answer
303-17-2-17	sister
304-17-2-18	gave advice/support
318-17-16	no one
302-17-18	family didn't know what was
316-17-19	clinic
325-17-20	warn of complications
309-17-2-19	mother
329-17-2-20	helped with diet
330-17-21	understood how disease was affecting life
310-17-22	workers at Clinic
310-17-23	nurses
317-17-24	took to the hospital

18)	escribe the different responses you received when you first told your family you	had
diat	tes? Prompt – Can you give me an example? were they supportive of it? Did	they
helj	n your diabetes management? If so, how?	

Code Number	Description
313-18-1	no response
313-18-2	family
313-18-2-1	advice
301-18-2-15	lack of support
307-18-15	not surprised
303-18-16	scared
303-18-2-16	supportive
303-18-2-17	took to classes
304-18-17	surprised
308-18-18	family of ignorant of disease
323-18-19	sad
320-18-2-18	family supports each other
325-18-2-19	difficult for family to accept
325-18-2-20	always wondering about reason for physical appearance
309-18-2-21	emotionally supportive
329-18-2-22	warned of complications
330-18-2-23	calm
330-18-20	patient was in denial about condition
330-18-21	people don't understand that disease affects many facets of life
330-18-22	patient had fear of condition
330-18-23	if learn about condition, can handle it
310-18-24	worried
317-18-2-15-15	scold if eat the wrong things
317-18-2-16-15	take care of patient

## 19) When you need help with your diabetes, to whom do you turn to and how do they respond? *Prompt – friends, family, doctor*

Code Number	Description
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313-19-1	Doctor
313-19-2	Hospital not helpful
313-19-2-1	don't know how hospital helps
313-19-3	confusion about treatment
301-19-15	wife
301-19-16	kids
314-19-17	clinic
314-19-18	pamphlets/books/flyers
303-19-19	friends
303-19-19-1	helpful
304-19-20	sister
304-19-21	give advice
323-19-22	mother
320-19-1-15	increase medication
327-19-23	husband
327-19-24	help with medications
327-19-25	help with cooking
309-19-26	brothers
329-19-1-16	says to check sugar
329-19-1-17	says to watch diet
329-19-1-18	says to exercise
330-19-16-1	patient doesn't like to burden children
330-19-27	provide emotional support
310-19-28	government provides money
312-19-29	no one
317-19-30	is patient with the patient

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### Code book of interview questions and frequent responses (Katie Murtha)

# 20) Describe how having diabetes has changed your life. What do you do differently now? *Prompt: after being diagnosed with diabetes? How has your daily routine changed?*

Code Number	<b>Description</b>
313-20-1	everything
313-20-2	family
313-20-2-1	care for granddaughter
313-20-2-2	care for wife
313-20-3	no cure for diabetes
313-20-4	food
313-20-4-1	can't eat sweets
313-20-5	cannot do same things
301-20-15	employment
301-20-15-1	doesn't work anymore
307-20-16	no change
315-20-4-15	no greasy food
303-20-17	lost weight
304-20-18	negative, socially
308-20-19	exercise more
318-20-4-15	no alcohol
323-20-4-17	portion control
302-20-20	can't exercise
302-20-20-15	feet hurt
320-20-21	get more tired

320-20-22	eyes getting bad
320-20-23	no change in daily routine
316-20-24	take medication
316-20-4-18	drink more water
316-20-4-19	eat more solid foods
322-20-25	volunteer more
322-20-26	no smoking
325-20-4-20	time of meals
325-20-27	check sugar
325-20-28	be careful with cuts/scratches
327-20-29	change in daily routine
309-20-30	change in character
329-20-1-15	slowed client down a lot
330-20-46	live each day to the fullest
330-20-4-21	eat breakfast
310-20-47	get sad about condition
311-20-4-22	eat less
312-20-48	changed patient sexually
317-20-49	an inconvenience
317-20-4-23	don't cook what used to
317-20-51	can't stand for long periods of time
317-20-1-16	every little thing will cause problems
319-20-52	easily angered
319-20-53	feet swell

### 21) How has having diabetes changed how you act with friends?

Code Number	Description
313-21-1	lack of social network
313-21-1-1	no friends after marriage
313-21-1-2	don't associate with friends
21-2	no change
303-21-15	friends helpful
323-21-16	friends get mad because no alcohol
320-21-17	friends more concerned with each other's health
322-21-18	don't hang out as much
322-21-18-1	get tired easier
325-21-19	difficult to go out to eat/drink with friends
309-21-20	friends in own world
309-21-21	friendships have changed
329-21-22	unrelated answer
330-21-23	found out who "real" friends are
330-21-24	created a barrier between patient and friends
330-21-25	friends have their own families to worry about
330-21-26	family separated after grandparents passed away
310-21-27	get angry more often
312-21-28	doesn't drink as much alcohol
317-21-29	gets angrier easier
326-21-30	people don't help each other out

### 22) What have you been told is important in taking care of your diabetes? Prompt: How do

### you feel about that?

Code Number	Description
313-22-1	Dr. Suggestions
313-22-1-1	take care of self
313-22-1-2	tells of possible consequences
313-22-1-3	blindness
313-22-1-4	bones start hurting
313-22-2	feel bad
313-22-3	complication
313-22-3-1	needs glasses
313-22-4	lack of money
313-22-4-1	doesn't have money to buy glasses
22-5	diet/food
22-6	exercise
301-22-15	prevent complications
315-22-16	take medication
315-22-17	control blood sugar
303-22-18	feel good
323-22-19	feel scared
302-22-20	don't know/haven't been told
320-22-21	maybe needs someone to keep organized with treatment
316-22-22	don't follow timing restrictions with treatment
322-22-23	lose weight
322-22-23-1	will not have to use insulin
322-22-24	accepted that has to live with restrictions
322-22-25	stop drinking
322-22-26	stop smoking
325-22-5-15	eat red meat
325-22-27	wants to do the opposite
327-22-28	hard to cook differently
329-22-29	tired of hearing about it
330-22-30	foot care
330-22-46	have to face it/deal with it
310-22-47	stay calm
310-22-5-16	eat more
311-22-48	agree with it
312-22-49	it's not possible
312-22-5-17	no greasy food
312-22-5-18	no candy
317-22-50	family reminds
317-22-51	feel irritated
319-22-52	it's important
326-22-5-19	eat vegetables
328-22-5-20	barrier, work

## 23) Describe some of the things you do well about managing diabetes and why? *Prompt: Which of these do you do best*?

Code Number	Description
313-23-1	take care of self

don't drink		
less driving		
tired vision		
	don't drink less driving tired vision	

Code book of interview of	uestions and frequent	t responses (Katie Murtha)

313-23-1-2-1	tired vision
23-2	Doctor's suggestions
23-3	Diet
23-4	Exercise
20-4	Taka Madiaina
23-3	
307-23-3-15	NO SWEETS
314-23-3-16	less sugar
314-23-3-17	vegetables
314-23-3-18	no soda
303-23-16	monitor blood sugar
308-23-17	organized
318-23-3-19	no fatty foods
320-23-3-20	portion control
322-23-4-15	control weight
325-23-18	take insulin
327-23-19	go to doctor's appointments
329-23-20	Have plenty of time
310-23-21	staying peaceful
312-23-22	nothing
317-23-24	spend time with family
319-23-3-21	eat regularly
326-23-3-22	lots of water
328-23-3-23	eat salads

# 24) Describe some things that you don't do well. *Prompt: What makes it difficult for you to do this well?*

Code Number	<b>Description</b>
313-24-1	exercise
313-24-2	diet/food
313-24-3	medicine
313-24-4	unrelated answer
313-24-4-1	takes care of self, does well
313-24-4-1-1	take medicine
313-24-4-1-2	work
313-24-4-1-3	water
313-24-4-1-4	no pop
313-24-4-1-5	no sweets
313-24-4-1-6	no sugar
301-24-2-15	cultural preferences
301-24-2-16	Italian food preferences
301-24-1-15	physical restrictions
314-24-2-17	resisting desserts
315-24-15	don't know
303-24-16	peer pressure
304-24-1-16	not enough time
304-24-2-18	not enough money
308-24-2-19	fear of weight gain
318-24-17	sleep

1

302-24-18	lack of desire
316-24-2-20	information about sugar confusing
322-24-2-21	resisting pop
322-24-2-22	difficult at work
325-24-2-23	resisting chips
325-24-2-24	likes to bake
327-24-2-25	planning meals
327-24-2-25-1	time consuming
327-24-2-25-2	has to cook for family
309-24-3-15	forget
331-24-19	nothing
330-24-20	checking blood sugar
330-24-21	sight barriers
330-24-22	difficult to depend on others
310-24-23	don't always treat people well
317-24-2-17	eating less
317-24-2-18	cooking without grease
326-24-24	become irritated
326-24-25	forget to do something
328-24-2-19	resisting sweets

### 25) What if any, are the advantages to managing your diabetes? Why?

Code Number	Description
313-25-1	telling others
313-25-1-1	telling others to get check ups
313-25-2	doesn't know where he got it from
313-25-3	gets upset at self
25-4	live longer
25-5	family
307-25-15	better diet
314-25-16	feel better
324-25-17	keep it under control
308-25-18	prevent complications
308-25-19	stay healthy
318-25-20	seeing the doctor regularly
302-25-21	unrelated answer
321-25-22	be able to stop taking medicine
321-25-23	prevent using insulin
322-25-24	less bathroom breaks
327-25-25	it'll get better
309-25-26	lose weight
329-25-27	no advantages
330-25-5-15	be there for spouse
330-25-5-16	see kids grow up
330-25-28	difficult to be positive about disease
330-25-28-15	diabetes takes a physical, mental, and emotional tole
330-25-28-16	diabetes destroys entire life
310-25-29	be happy
310-25-30	not give trouble to anyone
311-25-46	health improves

312-25-47	can keep blood sugar under control
317-25-48	get dietary instruction from clinic
319-25-49	don't know
326-25-50	get calm
326-25-50-15	helps patient do everything right

# 26) What do you think the role of medicine is in managing diabetes? And What do you think the role of food is in managing diabetes? *Prompt: Do you think that one is more important than the other?*

Code Number	Description
313-26-1	prevent from getting higher or lower [blood sugars]
313-26-1-1	don't know much
313-26-2	don't know
313-26-2-1	likes a lot of foods
313-26-2-2	cultural foods
313-26-2-2-1	tortilla
313-26-2-2-2	rice
313-26-2-2-3	brought up eating those
313-26-3	don't know
301-26-3-15	medicine
307-26-2-15	control
307-26-3-16	both important
314-26-1-15	damage organs
314-26-2-16	positive
314-26-3-17	food
315-26-1-16	stay well
324-26-2-17	prevent complications
303-26-1-17	take regularly
308-26-2-18	cost barrier
318-26-2-19	no role
323-26-1-18	makes stomach upset
323-26-3-18	medicine
316-26-1-19	it's good
316-26-2-20	it helps
316-26-3-18	depends on prescriptions
322-26-1-20	don't know
325-26-1-21	prevent diabetic shock/coma
325-26-2-21	portion control important
327-26-2-22	worsens it
329-26-2-23	junk food is good food
331-26-2-24	depends on who is cooking
330-26-1-22	make life easier
330-26-2-25	pay attention to how foods are good and bad for you
330-26-2-26	can't enjoy as many cultural dishes
330-26-3-19	even out both
310-26-1-23	unrelated answer
310-26-2-27	unrelated answer
311-26-1-24	it's necessary
311-26-2-28	it's necessary
312-26-1-25	it works

317-26-1-26	have to take on time
317-26-2-29	have to eat too little
319-26-2-30	don't eat sweets
326-26-2-46	feel bad when eat a lot of grease

# 27) What do you do on a daily basis to take care of yourself or your diabetes? *Prompt:* exercise, medical care, diabetes education school? What do you think is the best way for you to take care of yourself?

Code Number	Description
313-27-1	eat oats
313-27-1-1	use to eat big bowl of cereal, not anymore
313-27-р1	don't drink too much sugar
313-27-р2	follow the diet
301-27-15	exercise
301-27-p2-15	follow medical advice
307-27-16	nothing different
314-27-17	medicine
314-27-18	breakfast
315-27-19	check blood sugar
324-27-20	follow routine
303-27-p2-16	take medication
308-27-15-1	barrier, physical pain
323-27-21	drink water
323-27-22	eat salad
302-27-23	cook with less lard
320-27-24	eat right
320-27-p2-17	put self first
321-27-p2-18	lose weight
321-27-25	portion control
321-27-26	less sweets
322-27-27	monitor blood sugar with food and insulin
325-27-28	take insulin
327-27-p2-19	eating
327-27-p2-20	exercise
327-27-p2-21	control blood sugar
309-27-29	cook food separate from family's food
309-27-30	eat fruit
330-27-46	still trying to figure that out
310-27-p2-22	don't eat things that cause damage
311-27-p2-23	continue treatment
311-27-47	eat less
311-27-48	eat every three hours
319-27-49	rest
326-27-p2-24	not have problems
328-27-p2-25	stay calm
328-27-50	work every day

### 28) What would you like to do to be healthy?

Code Number	Description
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313-28-1	can't do things because of diabetes
313-28-1-1	parties
313-28-1-2	drink beer
313-28-2	unrelated answer
313-28-2-1	not have diabetes
301-28-15	working
301-28-1-15	facilitator: family
307-28-16	exercise
314-28-17	relax
314-28-18	take time for self
315-28-19	take medication
303-28-20	live healthy
304-28-21	control diabetes
308-28-22	talk to dietitian
308-28-22-15	simple explanation
318-28-23	not have other conditions
323-28-1-16	exercise for a long time
302-28-24	lose weight
302-28-24-15	barrier: lack of desire
320-28-25	no pain
321-28-26	be able to get around
322-28-27	get younger
327-28-28	plan meals better
329-28-29	should have listened to parents when younger
310-28-30	not eat anything that causes damage
312-28-46	be a naturalist
317-28-16-15	barrier: physical restrictions
326-28-47	spend time with family
328-28-48	do everything can do

## 29) What helps you in taking care of yourself? *Prompt: What are some things that helped you manage your diabetes?*

Code Number	<b>Description</b>
313-29-1	foods
313-29-1-1	less sugar
313-29-1-2	less sweets
313-29-2	be more careful
301-29-15	exercise
301-29-15-1	barrier: need help
307-29-16	no soda
314-29-17	don't know
315-29-18	not having problems
324-29-19	family support
303-29-20	clinic
308-29-21	own willpower
308-2 <del>9</del> -22	fear of complications
308-2 <del>9</del> -23	desire for weight loss
323-29-24	follow diet
323-2 <del>9</del> -25	take medication
320-29-26	Have a routine

321-29-27	rest often
325-29-28	desire to see family grow up
327-29-29	not feeling sick
309-29-30	being able to handle stress
329-29-1-15	smaller portions
331-29-1-16	water
330-29-46	being able to see
330-29-47	fighting losing eyesight
310-29-48	motivated by children
312-29-49	don't smoke
312-29-50	don't take drugs
317-29-51	happy when it's controlled
328-29-52	control nerves

# 30) Are there any specific foods or other things that you believe help you with your diabetes? *Prompt: What are they? Tell me how they/it helps you?*

Code Number	<b>Description</b>
313-30-1	facilitator
313-30-1-1	foods
313-30-1-1-1	fruits
313-30-1-1-2	watermelon
313-30-1-1-3	cantaloupes
313-30-1-1-4	strawberries
313-30-1-1-5	berries
313-30-2	not helpful foods
313-30-2-1	ice cream
313-30-2-2-	cake
313-30-3	never been on diet
313-30-1-2	didn't feel bad
307-30-1-1-15	water
307-30-1-1-16	vegetables
307-30-1-1-17	dairy
307-30-1-1-18	salads
314-30-2-15	greasy foods
304-30-1-15	no diabetes symptoms
304-30-2-16	tortillas
308-30-2-17	starchy foods
323-30-1-1-19	dried rice
323-30-1-1-19-15	fewer calories
302-30-15	none
320-30-1-1-20	baked/boiled food
320-30-1-1-21	olive oil
320-30-1-1-22	get used to diabetic food
320-30-1-1-23	less sweets
316-30-1-1-24	vitamins
321-30-2-18	currently all foods
322-30-1-1-16-15	keeps client from eating junk food
325-30-1-1-16-16	clean toxins from body
327-30-1-1-25	green beans
327-30-1-1-26	black coffee

hospital food
oatmeal
feel better in long run
pepper
jello
cuts out a lot of disease
everything natural
pear, cucumber, apple, lettuce, tomato
feel good/light
eat less
tea
helps control blood sugar

# 31) What keeps you from taking care of yourself? *Prompt: What are some of the difficulties in managing your diabetes*?

Code Number	Description
313-31-1	medicine
313-31-2	barrier, foods
313-31-2-1	cake
313-31-2-2	cookie
313-31-2-3	diet pop
301-31-15	worry
301-31-15-1	family
301-31-15-1-1	not supportive
301-31-16	distrust
307-31-17	exercise
307-31-18	lack of desire
314-31-19	don't know
315-31-20	greasy foods
315-31-21	unrelated answer
324-31-22	nothing
303-31-23	stress
303-31-24	work
304-31-25	lack of money
320-31-26	lack of time
320-31-27	trying to be responsible all of the time
320-31-28	questioning self
316-31-29	myself
316-31-2-15	selecting foods
321-31-30	difficult to get around
322-31-1-15	don't like having to take medication when traveling
325-31-1-16	difficult to take insulin when sick
327-31-2-16	food is good
327-31-2-17	cook for entire family
330-31-46	being scared/fear
312-31-47	the gula
317-31-48	always puts others first

#### 32) What is the most difficult thing about controlling your diabetes?

Code Number	Description
313-32-1	physical barrier, vision
313-32-1-1	vision problems
313-32-1-1-1	cannot read
313-32-2	can't do things he wants to do
301-32-15	medication
307-32-16	exercise
314-32-17	diet
314-32-17-1	barrier, work schedule
315-32-18	don't know
303-32-17-2	barrier, holidays
308-32-19	getting lazy, denial
323-32-20	nothing
320-32-21	lack to time
320-32-22	fear of blood results
321-32-17-3	control portions
322-32-23	poking finger
325-32-15-15	giving self insulin shots
327-32-17-4	fried chicken
329-32-24	condition will never go away
330-32-25	controlling blood sugar
330-32-25-1	body feels really bad
310-32-26	can't walk
311-32-27	no alcohol
311-32-28	pinching self
312-32-29	not being able to exercise
326-32-17-5	not being able to eat meat
328-32-30	resisting bread

### 33) What is it about where you go for health care that you like or dislike and why?

Code Number	Description
313-33-1	positive, treat good
313-33-2	Good doctor
313-33-3	barrier
313-33-3-1	cost of other health care
313-33-4	Clinic
307-33-15	negative, long waits
314-33-16	everything fine
303-33-17	personalized care
308-33-18	close to residence
308-33-3-15	type of health plan
318-33-19	good nurses
321-33-20	take care of condition
322-33-21	negative, getting shots
322-33-22	good to see blood work results
327-33-23	negative, don't follow through with stuff
329-33-24	likes the routine, regular check-ups
331-33-25	attention
331-33-26	listen to you
330-33-27	negative, don't see same doctor each visit

330-33-27-1	have to tell entire life story each visit
317-33-28	don't necessarily have to make an appointment
319-33-29	like it a normal amount
328-33-30	no answer

#### 34) What do you think the role of doctor should be in helping you with your diabetes?

Code Number	Description
313-34-1	Give advice
313-34-2	ask questions
313-34-1-1	telling what to do and what not to do
301-34-15	provide medication
314-34-16	attention
324-34-17	monitor condition
318-34-18	unrelated answer
325-34-19	friend of the family
329-34-20	only follow procedures
329-34-21	listen to what the patient says hurts
330-34-22	be honest
330-34-23	do everything that can for patient
310-34-24	to make patient better

### 35) Where and from when did you learn how to take care of yourself?

Code Number	Description
313-35-1	Doctor
313-35-1-1	Only doctor seen
313-35-2	Clinic
303-35-15	friends
303-35-16	work
304-35-17	dietitian
304-35-18	nurse
302-35-21	self
320-35-22	hospital
325-35-23	sister
310-35-24	husband
317-35-25	class at hospital
319-35-26	father
319-35-26-15	says to take care of self
328-35-27	wife

### 36) What organizations, groups individuals do you get helpful information from?

Code Number	<b>Description</b>
313-36-1	none
313-36-2	Clinic
313-36-15	hospital programs
303-36-16	community events
303-36-17	family
303-36-18	friends
304-36-19	clinic diabetic program

308-36-20 doctor 318-36-21 pamphlets 320-36-22 television diabetes classes 321-36-23 325-36-24 sister 330-36-25 American Blind Association 310-36-26 doctor 311-36-27 food guide pyramid 311-36-28 diabetes magazine literature from clinic 311-36-29 317-36-30 sparrow hospital

#### 37) What has been the most helpful resource or thing for you?

Code Number	<b>Description</b>
313-37-1	medicine
313-37-2	Insurance
313-37-2-1	Ingham Medical Plan
313-37-3	clinic
37-4	family
37-5	doctor
303-37-15	job
303-37-15-1	gain knowledge of diet
304-37-2-15	informational resources
304-37-16	publications
308-37-4-15	family not taking care of diabetes
302-37-17	no one
320-37-18	doctor's office
325-37-4-16	sister
327-37-5-15	provide insulin
329-37-4-17	motivation to see family grow up
310-37-4	family
310-37-4-18	happiness of children
311-37-19	equipment to check blood sugar
312-37-1-15	insulin
312-37-20	garlic
317-37-21	eating less food
328-37-22	don't know

### 38) Have you taken classes on diabetes? *Prompt: If no, Do you know if diabetes education is available to you?*

Code Number	Description
313-38-1	no classes taken
313-38-2	no knowledge of classes
301-38-15	knowledge of classes
315-38-16	classes taken
315-38-16-1	receptionist provided
304-38-17	taught people
318-38-18	not sure when classes available
302-38-19	lack of transportation

325-38-20	need more info about classes
329-38-21	gotta call a hospital to find out if classes available
331-38-22	interested in taking classes

### 39) Anything else you want to tell me about your management of diabetes?

Code Number	Description
313-39-1	no warning of diabetes
313-39-2	doesn't know why he got it
301-39-15	wish didn't have diabetes
307-39-16	should take care of it
314-39-17	no answer
315-39-18	worried about injecting insulin
303-39-19	barrier, cultural food preferences
303-39-20	facilitator, job environment
304-39-21	don't be in denial about condition
308-39-22	helpful to be organized
302-39-23	need to take medicine
302-39-24	confusion about not being able to exercise
320-39-25	difficult to follow through with treatment
321-39-26	hard to have diabetes
322-39-27	be sure to exercise
325-39-28	need something better than insulin shots
309-39-29	need to dedicate oneself to fighting disease
329-39-30	follow procedures
331-39-46	don't drink beer
330-39-47	health professionals need to personalize care
330-39-48	health professionals need to listen
311-39-49	have received the best help
312-39-50	patient is problem b/c does not take care of self
326-39-51	it's about not eating things that are bad for you

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