

Using the PEN-3 Model to Assess Knowledge, Attitudes, and Beliefs about Diabetes Type 2 among Mexican American and Mexican Native Men and Women in North Texas

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Abstract

The primary purpose of this mixed-methods study was two-fold: first, to assess diabetes knowledge, attitudes, disease management and self efficacy among a sample of Mexican American (MA) and Mexican-Native (MN) adults living in North Texas; and second, to determine factors which promote or deter diabetes prevention and management using Airihenbuwa's PEN-3 Model. Data was collected by way of quantitative surveys and focus groups. A volunteer sample of 100 MA and MN men and women who were living in North Texas and diagnosed with T2DM agreed to participate in the research. Data was analyzed using Pearson product correlations, t-tests, and MANOVA as well as qualitative analysis. Results showed that knowledge and perceived psychosocial impact scores for participants were significantly lower than those from national samples. No significant effects for gender were found. Barriers identified from focus group data included fatalistic views, language challenges, fear of deportation, mistrust of U.S. medical personnel, lack of financial resources, transportation, and guilt relating to the perceived burden of management and prevention of the disease. By using mixed methodologies and culturally inclusive planning models such as PEN-3, health educators and other personnel can develop more relative and empowering diabetes education programs and services for this population.

Key words: Type 2 diabetes, PEN-3 Model, Mexican-American, Mexican-Native, Mixed Methods.

Introduction

Type 2 Diabetes Mellitus (T2DM) is currently the sixth leading cause of death for all groups in the United States.¹ The prevalence of this disease is disproportionately higher among the Hispanic population, representing their fourth leading cause of death, claiming nearly 6,000 deaths annually.² The Centers for Disease Control and Prevention [CDC] reported over 15 million people currently live with T2DM in the United States.¹ This represents a 50% increase in diagnosis from five years prior. In addition, it is estimated that another 6 million people remain undiagnosed. Mortality rates associated with T2DM are actually three times higher for the Mexican-American (MA) and Mexican Native (MN) populations due to co-morbidities and underlying causes.³

Texas has some of the highest rates of T2DM in the U.S. The prevalence of people diagnosed with T2DM in Texas has increased each year since 1995.⁴ Furthermore, as of 2003 the death rate from T2DM among MA & MN men and women in the Border States, including Texas, was 27.6 per 100,000, second only to African Americans. As this population continues to grow in Texas, culturally competent T2DM education is vital for prevention, care, and program development. Addressing all "Hispanics" categorically is a weakness of previous studies. This categorization assumes, from a research standpoint, that the health status of all individuals classified within this governmental term is homogeneous.⁵ The 2000 US Census reported the total Hispanic population in Texas at 6,669,666 (32%). Of that, 5,071,963 (24.3%) are of MA or MN descent and the remaining 1,597,703 (7.7%) had no ties to Mexico.⁶ The methodology of these programs must expand from a standardized Caucasian-centered approach to a culturally tailored approach designed specifically for implementation among the subset of MA & MN.

Compared to other groups, MA & MN patients experience an increased gap in knowledge pertaining to T2DM.⁷ These factors are partially tied to the acculturation process and may include language barriers, mistrust in the diagnosis, soaring cost of health care, use of home remedies, and a fear of asking questions.⁸ Diabetes education programs may also fall short if individuals feel they have the disease under control, do not perceive the benefits of

exercise, or do not perceive the need to change eating habit.⁹

Chesla, Skaff, Bartz, Mullan, and Fisher¹⁰ evaluated the levels of understanding related to T2DM between Caucasian and MA & MN men and women. Compared to Caucasians, MA & MN men and women emphasize the symptoms of T2DM (e.g. excessive thirst, urination, and appetite, fatigue, vision problems, erectile dysfunction, and slow healing infections)¹¹ rather than the biological characteristics. MA & MN adults who emphasized biological factors generally have higher levels of education and acculturation to American practices. Attitudes toward learning or behavior change in this community center on gaining the respect and trust of participants.¹²

Ethnic non-majority groups comprise the majority of diabetic patients in the United States.¹³ MA & MN, representing the largest Hispanic subgroup, have the highest prevalence of both undiagnosed and diagnosed T2DM. It is essential for patients with T2DM to maintain a thorough understanding of the disease. At present, less than half of all MA & MN patients with T2DM have ever attended a diabetic education program.¹⁴ However, Borrell, Dallo, & White¹⁵ believed appropriate education can address positive health behavior changes such as proper nutrition and adherence to medical orders. This group is receptive to diabetes education and willing to change harmful behaviors.¹⁶ In order to make this a reality, health educators need to adapt communication methods which include this culture.¹⁷

Purpose of Study and Significance

The primary purpose of this mixed-methods study was two-fold: first, to assess diabetes knowledge, attitudes, disease management and self efficacy among a sample of Mexican American (MA) and Mexican-Native (MN) adults living in North Texas; and second, to determine factors which promote or deter diabetes prevention and management using Airihenbuwa's PEN-3 Model.

A gap in the professional literature exists in applying a cultural model to examine knowledge, attitudes, and beliefs of T2DM within this population. The researchers employed the PEN-3 model¹⁸⁻¹⁹ as a theoretical basis for this research to examine how health beliefs and behaviors associated with T2DM among MA & MN men and women in North Texas are interrelated and interdependent. This model (see Figure 1) uses the dimensions of *cultural identity*, *relationships and expectations*, and *cultural*

empowerment to provide culturally appropriate changes for diverse populations.⁶ In addition, individuals' self-efficacy²⁰ was assessed in this study, allowing health educators and program planners to prepare culturally competent diabetes education programs that enhance disease self-management skills. Focusing on this population's "perceived capacity" to manage and treat the disease will help alleviate fears, myths, and inaccuracies pertaining to T2DM in the MA & MN community. This approach provided a reliable framework for shifting the focus of T2DM among this population from 'blame' to 'understanding'.²¹

Methods

This descriptive study utilized a mixed-method design by means of two quantitative surveys and four focus group sessions. The use of a mixed-methodology helped triangulate the data and 'legitimize' the findings.²²

Sample

A purposive convenience sample (n=100) of MA & MN individuals diagnosed with T2DM living in Denton County, Texas, participated in the study, with 82 completing quantitative surveys and 18 participating in the qualitative focus groups. Participants were recruited through advertisements in church bulletins, flyers, and verbal announcements made by one of the church's Hispanic/Latina Outreach representatives before mass. Eligibility requirements included the following: 1) participants were of MA or MN origin; 2) diagnosed with T2DM; 3) at least 18 years of age or older; and 4) could read and write either English or Spanish. A large Catholic church served as the site for survey and focus group sessions. The current congregation of this church is comprised of over 2,500 families, in which 70% are of MA & MN origin. All data collection methods were approved by the Institutional Review Board (IRB) at Texas Woman's University and with the participating church's administrators.

As shown in Table 1, more than half of the participants were female (68.3%). The average age of participants was 46 years ($SD = 7.67$) and ranged from 24 to 71 years. The average height was 64.02 inches ($SD = 2.92$) and ranged from 55 to 73 inches. The average weight was 185.73 pounds ($SD = 36.60$) with the lowest and highest weights at 125 pounds and 310 pounds respectively. More than half of the participants completed high school or above; 29.3% graduated high school and 29.3% had some

college. Approximately 40% of the respondents reported their highest education level as some high school (40.2%) and only 1.2% reported completing 8th grade or less. Due to the small number of respondents indicating their highest education level was eighth grade or less (1.2%), this group was combined with the some high school group for use in further analysis.

Quantitative Data Collection and Analysis

Data Collection.

Survey participants had the opportunity to join one of the on-site sessions scheduled from February through March 2008. Participants were under no obligation to complete the study. A raffle drawing for five \$20 Wal-Mart gift cards was held following the last day of data collection. Statistical Package for the Social Sciences (SPSS) Version 15 was used to run data analysis for survey responses with an alpha level of .05. In order to achieve a moderate level of power (.70), a sample size of 82 was needed. The achieved power in the study with the final sample of 100 was .80. The following quantitative instruments were used for this study: the Diabetes Attitude Survey (DAS-3), and the Diabetes Empowerment Scale-Long Form (DES-LF). An overall measure of self-efficacy was calculated using all 28 items from the DES-LF. The perceived knowledge score was calculated using a subset of the items from the DAS-3.

In order to reach the widest possible audience and increase the accuracy of responses, questionnaires were provided in English and Spanish. Both instruments were available in a dual-language format (English and Spanish) by the original author. However, these instruments were developed in the northern region of the United States. In order to ensure the dialect was similar to that used by the populations of north Texas, back translation was completed by a bi-lingual, Mexican-American Assistant Professor at the local university. The new versions were then reviewed for accuracy by the lead facilitator at the church.

Based on suggestions from a member of the research team, who is also a native of Mexico and a trained linguist and instructor of ESL, the DAS-3 and DES-LF questionnaires were adapted from a 5-point to a 4-point Likert scale. The translator suggested the removal of phrase, "strongly disagree," as it was not culturally meaningful for this population.²³ In order to clarify answers, the term 'disagree' was used exclusively. Following this change, the modified instrument was pre-tested with a sample of six

eligible MA & MN adults in the community. Results from the pre-test showed there were strong correlations between original and new format ($r^2 = .85$). These participants were not included in the total sample. The pre-test data was also omitted from the final study.

Quantitative Analysis of Survey Data.

Data was coded using the scoring guidelines provided for the *DAS-3* and *DES-LF*. Scoring for nominal data included “0” for no and “1” for yes. Interval/ratio data for both instruments was coded as follows: “1” – Disagree, “2” – Neutral, “3” – Agree, “4” – Strongly Agree. Descriptive statistics were calculated for all items. Pearson’s product moment correlations were conducted to test the relationships between the continuous variables. Nonparametric χ^2 tests of association were conducted to test for patterns in the frequencies of the categorical variables.

Qualitative Data Collection and Analysis

Data Collection.

A total of four gender specific (2 male only; 2 female only) focus group sessions were held at the church. Groups were limited to 5-7 participants in order to foster open communication and allow every member an active voice. Each session lasted no more than 90 minutes. In order to provide a comfortable environment these groups were moderated by a trained bi-lingual leader in the church, fluent in English and Spanish. The researcher observed each group noting non-verbal responses. Participants were compensated with a \$10 Wal-Mart gift card following the session to thank them for their time. Instrumentation utilized questions from the *CDC Diabetes Prevention Marketing Study: Focus Group Discussion Guide* that followed constructs of the PEN-3 Model.

Qualitative Analysis of Focus Group Data.

Focus group sessions were audio recorded. A professional bilingual transcriber translated all Spanish audio content into English. Data was coded and analyzed using the *7 Steps to Analyzing Focus Group Data* guide from the University of Texas Southwestern Medical Center at Dallas.²⁴ Emergent themes were categorized using the PEN-3 Model. Coded data were fit into one of the following dimensions: (a) *Cultural Identity* (person, extended family, neighborhood); (b) *Relationships and Expectations* (perception, enablers, nurturers); and (c) *Cultural Empowerment* (positive, existential,

negative). This process “contextualized” the analysis to align with the theoretical paradigm

Results

Quantitative Surveys

A total of 82 participants volunteered to take the survey. As shown in Table 2, the length of time since diagnosis ranged from 1 to 20 years, with an average length of 6.77 years ($SD = 4.73$). The majority reported never participating in diabetes education programs (72%), with less than one-third reporting that they had participated in a diabetes education program (28%). A majority of the participants indicated taking T2DM medication (64.6%). However, a small percentage of respondents reported using insulin (11%) and smaller percentage (7.3%) report using insulin since being diagnosed. This group reported a low understanding of T2DM (3.51) and associated it with preventing them from completing daily activities (3.09). In addition, on a scale from 1 (never) to 7 (frequently), participants ability to handle the T2DM lifestyle was moderate at 4.77 ($SD = 1.38$), while comfort level with their physician averaged 4.63 ($SD = 1.49$). Finally, the number of years since diabetes education ranged from 1 to 15 years and averaged at 5.70 years ($SD = 3.43$).

Correlation analysis was conducted to examine the relationships between the following instrument subscales: Need for Special Training, Self-Efficacy, Psychosocial Impact of T2DM, Perceived Knowledge, and the continuous demographic variables (see Table 3).

Perceived Knowledge of T2DM. Perceived knowledge of T2DM among survey participants was significantly negatively correlated with their perceptions that T2DM prevented them from completing normal daily activities, $r(80) = -.24, p < .05$. Higher scores on perceived knowledge were associated with a lower frequency that diabetes prevented participation in normal activities and behaviors. In addition, perceived knowledge was positively correlated with understanding, $r(80) = .24, p < .05$, T2DM lifestyle, $r(80) = .24, p < .05$, and comfort with doctors, $r(80) = .45, p < .01$. Higher scores on perceived knowledge were linked with greater: understanding, ability to handle a T2DM lifestyle, and comfort with physicians. The effect for diagnosis length (5 years or less vs. more than 5 years) was not significant, $F(1, 80) = .008, p = .93$. No significant effects for gender were reported, $F(1,$

80) = .029, $p = .87$. These findings contrast results of previous studies.^{25, 26}

Psychosocial Impact of T2DM. Regarding the variable of *Psychosocial Impact of T2DM*, participants' perceived ability to manage psychosocial aspects of T2DM was significantly lower than the national mean of 3.91.²⁷ Results revealed *Psychosocial Impact of T2DM* was significantly positively related to age, $r(80) = .33$, $p < .01$, understanding, $r(80) = .26$, $p < .05$, T2DM lifestyle, $r(80) = .27$, $p < .05$, and comfort with physicians, $r(80) = .28$, $p < .05$.

Self-Efficacy. Scores for participant's level of self-efficacy were significantly positively related to understanding of the disease, $r(80) = .26$, $p < .05$, maintaining T2DM lifestyle, $r(80) = .32$, $p < .01$, and level of comfort with physicians, $r(80) = .33$, $p < .01$. A person's adherence and perceived ability to handle the issues associated with T2DM are tied to education.^{10, 15}

Need for Specialized T2DM Training and Care. Survey results revealed greater scores on Need for Special Training related to T2DM compared to the other items. Need for special training was significantly positively related to age, $r(80) = .32$, $p < .01$, diagnosis length, $r(80) = .22$, $p < .05$, and comfort with physicians, $r(80) = .26$, $p < .05$. Self-Efficacy was also reported higher among this group compared to both Attitude and Perceived Knowledge scores. Respondents with higher levels of education generally place a greater value on this need.¹⁰

Education and T2DM. The effect for education level was significant, $F(2, 79) = 13.20$, $p < .001$. Post hoc tests using Tukey's HSD indicated that respondents completing at least some college had greater overall scores ($M = 3.55$) compared to those completing some high school or less ($M = 3.19$, $p < .001$). Higher levels of education have been found to increased compliance with all aspects of T2DM management.²⁹ MA & MN females in this study reported a higher percent of completing a diabetic education program compared to males. However, only 28% of participants reported taking part in any type of diabetic education program since being diagnosed. This is well below the national average of participant's who report attending T2DM education.¹⁴

Qualitative Focus Groups

A total of 18 individuals participated in the four focus groups with equal gender distribution (9 male,

9 female). All participants positively identified themselves as being diagnosed with T2DM and either MA or MN heritage. In order to maintain anonymity, variables such as age, marital status, length of diagnosis, education level, etc. were not measured. Themes were categorized by the dimensions of the PEN-3 Model: (a) *Cultural Identity* (persons, extended family, neighborhood); (b) *Relationships and Expectations* (perception, enablers, nurturers); and (c) *Cultural Empowerment* (positive, existential, negative). Each dimension of this model has three independent components which form the acronym PEN (see Figure 1).

Cultural Identity. The first dimension, cultural identity helps to define the target audience (person, extended family, and neighborhood). The *Person* phase focuses on empowering individuals to make healthy decisions. *Extended family* seeks to include the entire family unit (nuclear family and external relatives) in the health process. The *neighborhood* component strives to gain acceptance of positive health behavior change and programs among gatekeepers and key leaders in the specified community.

Focus group findings which fit the dimension of *Persons*, *Extended Family*, and *Neighborhood* included themes relating to lack of knowledge, fatalistic views, and fear (see Table 4). The family unit was identified as a strong system for support. However, family members also experienced an increase in concern and worry related to the person diagnosed with T2DM.

Sixteen of the 18 qualitative respondents reported a deficit in their knowledge of T2DM. All of the participants hoped to live a long life. However, 88% felt the disease was out of their control and had no idea of what T2DM management involved. These findings support the results from previous studies.^{7, 10} Responses from the sessions included, "It is a bad disease you get from going to the doctor," "People do not know about this (T2DM)," "We need more teaching," and "Our knowledge is low. It is a type of mystery disease. We seem to wait until someone has it to learn more."

Participants acknowledged the dire need to control this disease. However, factors such as fear, low willpower, poor diet, and a lack of exercise were identified as actions contra to maintaining control of T2DM. MA & MN diagnosed with T2DM may also suffer from depression or increased rage which can translate to a lack of adherence for diabetes education and a reduction in the tight glucose control.²⁹ The

potential cofactors associated with T2DM are important for health educators to consider when developing and implementing culturally specific programs to this group.

Relationships and Expectations. This dimension determines the factors (perceptions, enablers, and nurturers) influencing the actions of the target audience. Elements from the Health Belief Model, the Theory of Reasoned Action, and PRECEDE-PROCEED are used in conjunction with the culture being studied. When utilizing this construct, participants identified negative stigma and barriers to receiving care as *perceptions* and *nurturers* of T2DM (see Table 5). Participants mentioned the need to detach from the traditional American healthcare system, which was an *enabling* factor. Culturally specific outreach programs in Spanish were commonly requested. Results from this study underscore the importance of using the correct person to implement T2DM programs. According to the participants in this study, this crucial element is often overlooked.

Focus group participants reported the existence of positive social networks to assist them with the arduous tasks related to maintaining a diabetic lifestyle. However, 100% (n=18) had difficulty understanding and communicating in a language other than Spanish. Some form of depression since being diagnosed with T2DM was experienced by 88%. Male participants (75%) experienced an overall increase in anger and hostility linked to T2DM. The same percentage expressed a conflict between treatment methods and their cultural beliefs, did not believe T2DM treatments to be effective, and found difficulty performing all of the daily duties required with T2DM (see Table 6).

All of the focus group participants believe T2DM is very common among this population. Participants reported T2DM is considered a “mystery” disease and added that a stigma is attached to anyone identified with it. A strong support system is required to properly maintain physical and mental health during treatment.^{25,30} However, the lack of knowledge in this community, regarding T2DM, results in extremely negative views of the disease. It was reported that many MA & MN people not only live in fear of being diagnosed, they also believe this disease can be transmitted through personal contact.

Cultural Empowerment. This component is vital in the development of culturally sensitive interventions and instruments to assess the target health behavior of ethnic minority cultures. The three components

are comprised of *positive*, *exotic*, and *negative behaviors*. While a low level of knowledge regarding T2DM was revealed among the group, participants strongly identified *positive behaviors* such as a strong desire to live and value in the church (see Table 7). *Existential behaviors* verified the predominate use of alternative medicines to treat the disease. *Negative behaviors* noted were lack of control, guilt, mood changes, and mistrust in T2DM diagnosis. One participant reported:

“It (T2DM) takes a lot of patience and support from everyone in your life. I’m terrified and don’t want this for my family. They can feel I am different now and blame the changes on diabetes. At times I have trouble seeing and get confused. Love from my family keeps me trying to fight it.”

Participants in focus groups added that this population views doctors from the United States in a negative manner. The general feel was that physicians in this country fail to address their needs and offer little to no benefit related to T2DM care. This includes a lack of time explaining what T2DM is during office visits, exorbitant costs, unnecessary tests, and anxiety associated with going to the doctor. The firsthand account stresses the need to target specialized T2DM educational programs for MA & MN. Due to mistrust in the diagnosis and unsatisfactory experiences with American doctors, 33% of participants reported having a primary care physician which they visit regularly in Mexico. This has also been found in prior studies.⁸ Key quotes from the four primary questionnaire categories are listed below (see Table 8).

Discussion

Using mixed-methodology allowed for a comprehensive understanding of the issues faced by MA & MN adults living with T2DM. The views expressed between focus group and survey responses provided varying insights on a few of the measured aspects. Results from both phases identified low working knowledge and negative cultural stigma associated with the disease. Reported differences between methods could be the result of: the type of instruments used (closed answer questionnaires versus open-ended focus group sessions), the researcher effect, or an increased level of comfort answering focus group questions with their peers.

The literature identified gaps in culturally appropriate methods used for diabetes education and treatment and competent care¹⁴ among this population.^{17, 31} These findings were also confirmed in this study.

Health educators need to move away from the homogeneous “one size fits all” approach when developing T2DM education programs for MA and MN groups. Simply translating information into Spanish is not enough. Cultural, ecological, and lifestyle characteristics must be taken into account and used as a framework for care.

Health professionals and program planners can build T2DM relevant programs around the strong support networks which may already be in place within the culture. One step toward developing competent programs is recognizing this culture does not adhere to the isolationist norm generally found in the United States. The impact of T2DM is experienced by everyone in the family. Thus, giving every member a voice can increase attendance in education programs and knowledge in the community.

A diversity of individuals, including *promotores/as* (men and women who promote health in their communities), may be recruited to deliver effective education.³² MA & MN place greater emphases on mutual trust and respect from those who administer care.¹² Training people already revered in the community can increase knowledge and counteract negative views associated with American physicians.

Collins Airhihenbuwa wrote that “those who develop health and education programs must examine carefully the differences as well as the similarities in cultural perceptions, so as to understand health beliefs and practices more fully and to address them appropriately within their particular context.”^{33, (p.6)} Results from this study demonstrated how mixed methods and the PEN-3 model can be used to help identify and address barriers to prevention and treatment of T2DM among MA and MN adults within the context of culture. Matching the cultural characteristics of Mexican culture to diabetes interventions and services will improve receptivity to, acceptance of, and salience of these efforts.

Results from this study cannot be generalized to all MA & MN adults in the United States, or MA and MN adults who have T2DM. Participants were volunteers, recruited from one large Catholic church in north central Texas. While every effort was made to include the widest possible audience within this group, more than half of the participants were female. Data was also captured at one point in time and was contingent upon the participants’ recall and feelings at the time the survey or the focus group

was completed. Finally, since this study relied on volunteers, the results relate only to those who are willing to acknowledge they have T2DM or who are comfortable completing surveys or focus groups relating to this topic.

Recommendations

In order to validate these findings, more research is needed. Future research should include larger samples and MA & MN men and women drawn from various locations across the Border States. Another recommendation is using the same instruments from this study but reducing the number of questions. A number of participants were discouraged by the length of the instrument and inquired if a shorter version was available. The use of fewer questions could increase participation.

The PEN-3 model served as an appropriate theoretical foundation for this research. However, more studies are needed to accurately identify the methods of ‘best fit’ required to increase knowledge levels, beliefs, and self-efficacy among MA & MN adults. Studies using PEN-3 as well as other culturally appropriate models will help balance the dearth of research on T2DM relating to this population, and provide a springboard for program planning. With globalization and demographic transformation occurring within the United States, the need for health educators, physicians, nurses, and other health professionals to deliver effective, tailored health education and services has never been greater.

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Figure 1. The PEN – 3 Model.

Source: Airhihenbuwa & Webster (2004).

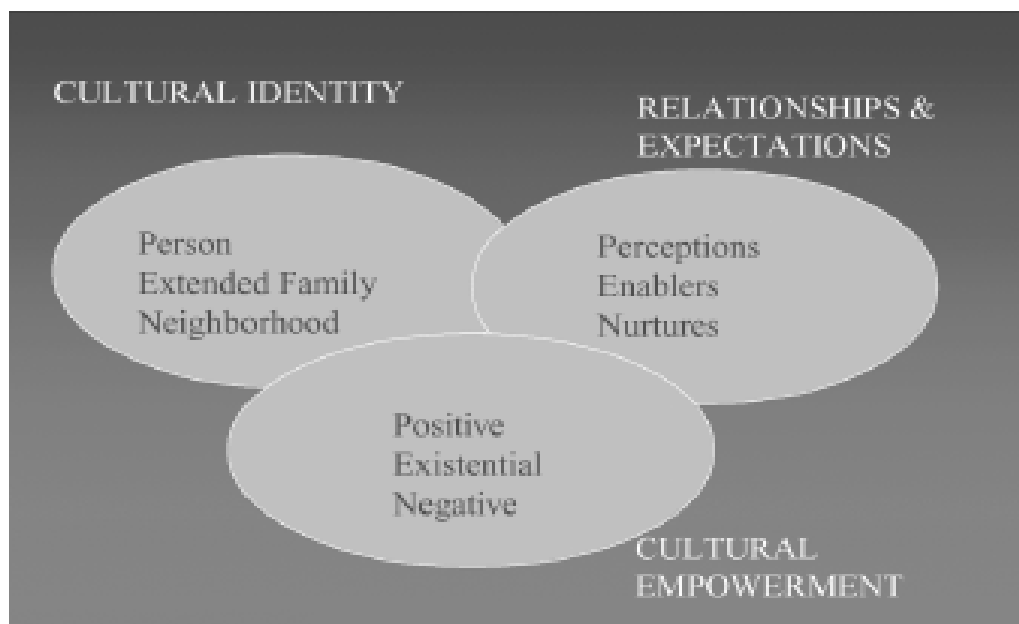


Table 1. Frequencies and Percentages of Demographic Variables (n=82)

	<i>n</i>	%	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Sex						
Male	26	31.7	49.23	8.21	34	68
Female	56	68.3	47.09	7.85	24	71
Age	82	100	46.05	7.67	24	71
Total Height (inches)	82	100	64.02	2.92	55	73
Weight (pounds)	82	100	180.73	36.60	125	310
Education Level						
8 th grade or less	1	1.2				
Some high school	33	40.2				
High school graduate	24	29.3				
Some college	24	29.3				

Table 2. Characteristics of the Sample (n=82)

	<i>N (%)</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Diagnosis Length (years)	82	6.77	4.73	1	20
Diabetes Education Program					
No	59 (72%)				
Yes	23 (28%)				
Medication					
No	29 (17%)				
Yes	53 (65%)				
Insulin					
No	73 (89%)				
Yes	9 (11%)				
Insulin Always					
No	76 (93%)				
Yes	6 (7%)				
Prevent Daily Activities*	82	3.09	1.73	1	7
Understanding*	82	3.51	1.84	1	7
T2DM Lifestyle*	82	4.77	1.38	1	7
Comfort with Doctor*	82	4.63	1.49	1	7
<u>Years since Diabetes Educ</u>	<u>23</u>	<u>5.70</u>	<u>3.43</u>	<u>1</u>	<u>15</u>

*Note: Items rated on 7-point Likert scale. With 1 = poor/not at all, 7 = frequently/very comfortable

Table 3. Pearson's Product Moment Correlation between Instrument Variables (n=82)

	Perceived Knowledge	Psychosocial Impact of T2DM	Self- Efficacy	Need for Special Training
Diagnosis Length	.002	.103	.166	.233*
Prevention	-.236*	.027	-.094	-.171
Understanding	.244*	.029	.255*	.127
T2DM Lifestyle	.244*	-.033	.318**	.097
Comfort w Dr.	.446**	.085	.332**	.262*
Years since Ed (n=23)	-.186	.279	.395	.327

Note: * $p < .05$, ** $p < .01$.

Table 4. Cultural Identity of T2DM among MA & MN Women & Men in North Texas (n = 18)

Persons	Extended Family	Neighborhood
-Shocked and depressed upon being diagnosed	-Strong family support system -Includes help with food, exercise, and motivation -Very worried	-Disease common within the community -Pervasive belief that little can be done to prevent it -Viewed negatively -People live in fear of getting T2DM -Low working knowledge of the disease -Considered a ‘mystery disease’
-Fear -Fatalistic view -Concern -Denial upon being diagnosed	-Deep concern -Excessive worry -Support needed from family (spouse, children)	-Disease is considered a ‘curse’ -Little to nothing can be done to prevent this disease -Extreme lack of knowledge regarding T2DM in this culture -Fear of deportation -Little support is offered for this disease

Table 5. Relationships and Expectations of T2DM among MA & MN Women & Men in North Texas (n = 18)

Perceptions	Enablers	Nurturers
- Stigma with having this disease	-More programs and outreach needed in Spanish	-Language barrier with doctor and educators
-English is the primary language in the United States	-Trouble speaking English	-Doctor's are always in a hurry and do not spend adequate time addressing patient needs
-Varying beliefs regarding the disease	-Accommodations needed such as childcare, travel, etc.	-Fear of going to American doctors
-Does not occur until you are in the United States		
-Believed to be very common in this culture	-Culture specific education in Spanish is needed to provide accurate information and dispel myths	-Desire among culture to help those in need
	-Lack of control with the U.S. healthcare system	

Table 6. Frequency of Responses Related to Relationships and Expectations of T2DM (n = 18)

	Yes (%)	No (%)
Need for Strong Social Network	18 (100%)	0
Comfortable with U.S. Healthcare	0	18 (100%)
Fluent in English	0	18 (100%)
Depression since being diagnosed	16 (88%)	2 (12%)
<i>Male Only</i>		
Increase in Anger	6 (75%)	2 (25%)
Conflict b/w Treatment & Culture	6 (75%)	2 (25%)
Belief in Treatment	2 (25%)	6 (75%)
Able to Perform T2DM Requirements	2 (25%)	6 (75%)

Table 7. Cultural Empowerment of T2DM among MA & MN Women & Men in North Texas (n =18)

Positive Behaviors	Existential Behaviors	Negative Behaviors
-Want to live and enjoy time with their children -Value the church as a support group	-Traditional practices to address the disease -Use of alternative medicines and home remedies -Include: teas, herbs, cactus, etc.	-Lack of knowledge -Feel the disease is out of their control -Lack of money -Lack of insurance -Feelings of guilt associated with the extra financial burden the disease has caused -Don't know where to go to receive proper care
-Importance placed on receiving regular health check-ups -Common to travel to Mexico for doctor visits	-Use of alternative medicines -Use of <i>curanderos</i> (can be negative if it prevents patient from receiving proper treatment)	-Mistrust with American doctors -Increase in negative mood (anger, aggression) associated with T2DM -More money needed to maintain health -Immigration status -Noncompliance with recommended changes -Language barrier

Table 8. Categories and Emergent Themes from Focus Groups (n=18)

Category	Themes
I. Background Knowledge T2DM	<i>"It [T2DM] will happen no matter what we do,"</i> <i>"I don't know that there is anything we can do,"</i> <i>"It seems to occur more in our culture."</i> <i>"Very, very common; it is a way to control our group."</i> <i>"There is nothing you can do if it is in your family history,"</i> <i>"Most of my family has it,"</i> <i>"We don't have knowledge of how bad it can become in the long run"</i>
II. Sources of Information	<i>"Need better access. I only speak Spanish and have many troubles with information"</i> <i>"Not enough variety with information in Spanish"</i> <i>"Not a lot of it [T2DM material] makes sense to me"</i> <i>"People learn about it through TV and Internet."</i>
III. Healthcare	<i>"I never go to the doctor after being diagnoses. I stopped going and treat myself with herbs, teas, and so on."</i> <i>"Not diagnosed [w/ T2DM] until getting to America."</i> <i>"Doctors are in a hurry and overbook. This adds to my frustration."</i> <i>"Communicating is hard. My son translates. They should provide this services."</i> <i>"People eat bad but don't want to follow doctor's orders. We need more than oral support. You should let the person choose how they want to treat the disease."</i> <i>"Various home remedies. I use these over going to the doctor."</i>

IV. Personal and Family Experiences	<i>"Family is important with this."</i> <i>"I require more time from her to help with this disease. I feel guilty with the extra support I need."</i> <i>"We need to know our family is there for us. The church is interested too."</i> <i>"People who know they have diabetes do nothing to follow-up. Do it for you family if nothing else. I have 6 year-old girl and want to see her grow up"</i>
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