CULTURAL ELEMENTS RELATIVE TO DIETARY BEHAVIORS FOR DIABETES SELF-MANAGEMENT AMONG MEXICAN-AMERICANS

By

Julie Plasencia

A DISSERTATION

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

Human Nutrition - Doctor of Philosophy

ABSTRACT

CULTURAL ELEMENTS RELATIVE TO DIETARY BEHAVIORS FOR DIABETES SELF-MANAGEMENT AMONG MEXICAN-AMERICANS

By

Julie Plasencia

Specific aspects of culture relative to Mexican-Americans have not been characterized relative to medical nutrition therapy (MNT) and/or education for in type 2 diabetes mellitus (T2DM) self-management and other health problems. The objective of the study is to add meaningful insight into culturally relevant aspects necessary for the development and/or adaptation of T2DM self-management programming for Mexican-Americans. To accomplish this, aspects of culture relative to T2DM self-management are explored through several innovative approaches. First, using a content analysis approach, an in-depth examination of literature on the perceptions of Mexican-Americans on self-management diet and physical activity behaviors was completed to identify cultural elements. Next, perceptions of culture by nutrition experts, specifically targeting registered dietitians, were examined using an online survey that explores cultural elements used in practice when counseling Mexican-American diabetes patients on achievement of self-management goals. Finally, curricula used in T2DM interventions that target Mexican-Americans were examined using a content analysis approach for the extent to which cultural elements are integrated into the written curricula.

Results from the first aim identified the top surface level elements mostly frequently found in the qualitative studies were food habits (n=15/19), food preferences (n=14/19), use or acquisition of nutrition knowledge (11/19) and healthcare provider preferences (11/19). The top three deep level elements most commonly found were general health beliefs or attitudes (n=19/19), beliefs or attitudes about foods in general (n=17/19) and family turmoil (n=14/19).

Findings from the second aim demonstrated that Registered Dietitian Nutritionist (RDNs) vary in their perceptions of cultural elements depending on years of professional experience. For example, the least experienced RDNs (average of 4.62 years) were more likely to perceive that beliefs about Mexican and American foods in general important for diabetes self-management compared to the highly experienced group of RDNs (average of 33.98 years). Additionally, RDNs who provided T2DM counseling to Mexican-Americans were more likely to fall in the least experienced group, be Certified Diabetes Educators, work in outpatient settings and provide individual counseling.

The final aim examined how six T2DM intervention curricula incorporated cultural elements. The results of this content analysis showed that the main cultural elements incorporated were related to diet were food habits, food preferences or avoidances, acquisition and use of nutrition knowledge, beliefs about Mexican/cultural foods and general health beliefs about foods. Specific health beliefs and values commonly recognized as influential factors for self-management and healthcare seeking behaviors for Mexican-Americans were less likely to be addressed.

Overall, these results suggest that culture-specific knowledge is not uniformly evident in nutrition therapy practice when Mexican-Americans who have T2DM. This may also be true for other healthcare professions working with this and other ethnic populations. Therefore, future research should focus on identifying opportunities for culture-specific cultural competency training, how these trainings transfer into better outcomes for patients, and finally, examining which and how cultural elements provide better behavior change outcomes in interventions.

Copyright by JULIE PLASENCIA 2017 I'll see you in my dreams papa.

ACKNOWLEDGEMENTS

Mama, gracias por el ejemplo que me has dado, de valor, trabajo y amor. Ray, gracias por tu apoyo, especialmente cuando no pude estar al lado de ustedes en momentos difíciles. Tu eres la razón que he podido lograr mis estudios. Papa, siempre fuiste una inspiración, y modelo de salud para mí. Nunca dejaste que la diabetes definiera tu vida, manejaste tu enfermedad mejor que cualquier persona que he conocido.

Dr. Lorraine Weatherspoon, a better future is never promised, but in giving me an opportunity, I am living a better future. I will always be grateful for all that you have given me, opportunity, advice, consolation, friendship, mentorship, encouragement, confidence and patience. Dr. Sharon Hoerr, thank you for your guidance, advice and support throughout graduate school. I learned so much from you and am very grateful for your willingness and openness to sharing your knowledge with me. To my committee members Dr. Maria Lapinski and Dr. Hector Balcazar, thank you for your guidance in completing this dissertation. Your, knowledge, support and feedback were instrumental in helping me complete my study.

I especially want to thank my student research and lab assistants, Allison Rehagen, Vidisha Paranjpe, Erin Gobielle, Jessica Ball and Melissa Roberts. You have all been instrumental in my development as a teacher, mentor and researcher. I also want to thank my lab mates in Dr. Weatherspoon's lab for your support and feedback. You made this experience very rich and positive for me.

I also want to thank my colleagues from Latinos and Hispanics in Dietetics and Nutrition, for your encouragement and reminding me the importance of the issues this dissertation

vi

addresses. To my friends and family in Michigan who made sure my life outside of school was filled with fun, food and dogs, thank you!

And finally, I appreciate the support from Michigan State University (MSU) Future Scholars in Teaching fellows and steering committee, Alliances for Graduate Education and the Professoriate, College of Agriculture and Natural Resources (CANR) and CANR Alumni Association, The Graduate School, MSU-Society for the Advancement of Chicanos and Native Americans in Science, and especially my department, Food Science and Human Nutrition, and the Academy of Nutrition and Dietetics Foundation, Commission on Dietetic Registration Doctoral Scholarship.

TABLE OF CONTENTS

LIST OF TABLES	. xi
LIST OF FIGURES	kiii
CHAPTER 1 - Introduction	1
A. Background	1
B. Specific Aims	4
1. Aim 1	4
2. Aim 2	4
3. Aim 3	4
C. Significance	5
CHAPTER 2 – Review of Literature	9
A. Diabetes Mellitus in Hispanics	9
B. Lifestyle-Related Diabetes Self-Management Recommendations	10
C. Factors Influencing Diabetes Control in Mexican-Americans	14
1. Social Factors	15
2. Environmental Factors	16
3. Cultural Factors	18
4. Health Beliefs and Values	20
D. Cultural Interventions for Diabetes Self-Management	23
1. Cultural Adaptation of Diabetes Interventions	23
2. Diabetes Self-Management Interventions for Hispanics	24
3. Diabetes Self-Management Interventions for Mexican-Americans	26
4. Cultural Competency and Communication	27
E. Conceptual Framework	29
1. Resnicow's Model for Cultural Sensitivity in Public Health	29
2. The Health Belief Model	32
3. Conceptual Model for Dissertation	33
CHAPTER 3 - Methods	35
A. Approach for Aim 1	35
1. Research Design	37
2. Sample	38
3. Instruments	40
4. Research Questions and Hypotheses	42
5. Analysis	43
B. Approach for Aim 2	44
1. Research Design	46
2. Sample	47
3. Survey Instruments	50
4. Research Questions and Hypotheses	51

5. Analysis	
C. Approach for Aim 3	54
1. Introduction	
2. Research Design	
3. Sample	
4. Research Ouestions and Hypotheses	60
5. Analysis	
CHAPTER 4 – Defining cultural perspectives of disease self-management by M Americans with type 2 diabetes	exican- 63
A. Abstract	
B. Introduction	65
C. Methods	
D. Results	
E. Discussion	
F. Conclusions	
CHAPTER 5 – Registered dietitians' perceptions of cultural elements for enhan	icing diet 91
A Abstract	
B Introduction	
D. IIII OUUCIOII	
D. Results	103
E. Discussion	118
F. Conclusions	126
CHAPTED (Culturel elements in disheter cell menorement intervention and	uioulo fou
CHAPTER 0 – Cultural elements in diabetes sen-management intervention cur	
Mexican-Americans with diabetes	
A. Abstract	
B. Introduction	
C. Methods	133
D. Results	
E. Discussion	150
F. Conclusions	153
CHAPTER 7 – SUMMARY AND CONCLUSIONS	156
APPENDICES	
APPENDIX A: Cultural Elements Coding Protocol. Study 1	
APPENDIX B: Cultural Elements Codebook	
APPENDIX C: Adapted Critical Annraisal Skills Programme Checklist	201
APPENDIX D. Diahetes Counseling and Culture Questionnaire	201
APPENDIX F. Diabetes Counseling and Culture Questionnaire Code Key	····· 205 715
A DEFNDIX E. Diabetes Counsening and Culture Questionnante Coue Rey	of Annuoval
ALLEMDIA F. MICHIgan State University Institutional Review Doard Letter	or Approval
APPENDIX G: Content Analysis Coding Protocol, Study 3	

APPENDIX H: Content Analysis Codebook, Study 3	50
APPENDIX I: Summary of articles results, CASP checklist scores and cultural elements	s.
	57
APPENDIX J: Sensitivity Testing Results for Exploratory Factor and Cluster Analyses	
	'2
BLIOGRAPHY27	/4

LIST OF TABLES

Table 1.1 Study	aims and objectives, design, variables, participants and analysis
Table 3.1 Key to	erms for extraction of studies
Table 3.2 Estim	ates and calculations for target sample 49
Table 4.1 Key to	erms for study extraction
Table 4.2 Inter-	rater reliability results for 44 cultural elements in 19 studies
Table 4.3 Inter-	rater reliability results for each item from the Appraisals Skills Programme
(CAS)	P) Qualitative Checklist from 19 studies78
Table 4.4 Frequ	ency and level of evidence of cultural elements from 19 studies
Table 5.1 List o	f Academy of Nutrition and Dietetics subgroups contacted for
dissen	nination of questionnaire with estimated number of members and members
reach	ed
Table 5.2. Demo	ographic characteristics of registered dietitian nutritionists in study who
provio	de diabetes counseling to Mexican-Americans (n=174)
Table 5.3. Profe	essional characteristics of registered dietitian nutritionists in study who
provid	de diabetes counseling to Mexican-Americans (n=174)
Table 5.4 Profes	ssional credentials, practice and training of registered dietitian nutritionists
in stud	dy who provide diabetes counseling to Mexican-Americans (n=174) 106
Table 5.5. Relia	bility testing of the Trust and Rapport Scale, Cultural Competency
Assess	sment Score, and Social Desirability Scale for registered dietitian
nutrit	ionists in study (n=174)
Table 5.6. Explo	oratory factor analysis results for deep-level cultural element items of
diabet	tes counseling and culture questionnaire among registered dietitian
nutrit	ionists in study (n=174)
Table 5.7 Explo	pratory factor analysis results for surface level cultural element items of
diabet	tes counseling and culture questionnaire among registered dietitian
nutrit	ionists in study (n=174)
Table 5.8. Cron	bach's alpha of factors from Exploratory Factor Analysis of Deep and
Surfa	ce Level Cultural Element Factor Solutions among registered dietitian
nutrit	ionists in study (n=174)

able 5.9. ANOVA results comparing differences between clusters of registered dietitian nutritionists
able 5.10. ANOVA results comparing differences between registered dietitian nutritionist clusters and their perceptions of cultural elements. (n=174) 116
able 6.1. Diabetes self-management curricula characteristics. (n=6)
able 6.2 Summary of cultural elements from content analysis in six diabetes self- management curricula
able 6.3 Cultural elements identified in diabetes self-management curricula examined and intervention outcomes reported in corresponding studies
able B.1 Cultural Elements Codebook183
able E.1 Diabetes Counseling and Culture Questionnaire Code Key
able I.1 Summary of articles results, CASP checklist scores and cultural elements 257
able J.1. Sensitivity testing results for exploratory factor analysis of deep-level cultural elements. (n=174)
able J.2. Sensitivity testing results for exploratory factor analysis of surface-level cultural elements. (n=174)

LIST OF FIGURES

Figure 2.1. Components of culturally sensitive interventions representing the framework for surface and deep level cultural elements from the Resnicow et. al. cultural sensitivity framework in public health)
Figure 2.2. Health Belief Model representing how culture may factor in health-related behavior change	
Figure 2.3. Conceptual model representing how culture impacts diet and physical activity related behavior change for type 2 diabetes self-management	,
Figure 3.1. Flow chart of literature search and selection of articles)
Figure 4.1. Summary of literature search and selection of studies)

CHAPTER 1 - Introduction

A. Background

Specific aspects of culture relative to Mexican-Americans have not been characterized relative to medical nutrition therapy and/or education for in type 2 diabetes mellitus (T2DM) self-management and other health problems. Diabetes mellitus is a disease for which self-management guided by trained healthcare professionals is important for achieving control and decreasing serious complications. Registered dietitian nutritionists (RDNs) are regarded as integral members of the team as the medical nutrition therapy experts (1). T2DM is disproportionately higher in ethnically diverse populations in the U.S., especially Mexican-Americans, one of the fastest growing Hispanic sub-groups (2). In this and all ethnically diverse populations, medical nutrition therapy and/or education is most likely to be effective when delivered within the context of culture. Therefore, *there is a critical need* for culturally sensitive and relevant medical nutrition therapy resources and approaches.

Diet-related diseases are on the rise, making the prevention of complications and health consequences of these diseases a priority. When T2DM is not diagnosed or poorly controlled for extended periods of time, in some cases years, it can lead to irreversible conditions such as loss of vision, kidney disease and peripheral nerve damage (3). These irreversible complications lead to a poor quality of life and may further reduce capacity for self-care (3). Strong evidence exists for the positive impact on health and prevention of disease complications through healthy lifestyle choices, especially pertaining to daily diet and physical activity (4, 5). Therefore, the healthcare professional community responded by developing medical nutrition therapy and education interventions for T2DM self-management.

Diet and physical activity are two daily lifestyle behaviors, which are key foci of medical nutrition therapy and education by RDNs for T2DM self-management. The American Diabetes Association periodically completes an extensive review of the literature and provides guidelines, the Standards of Medical Care in Diabetes for "clinicians, patients, researchers, payers, and other interested individuals" (6). In the latest recommendations, it is suggested that medical nutrition therapy should be individualized "based on personal and cultural preferences, health literacy and numeracy, access to healthful food choices, willingness and ability to make behavioral changes and barriers to change" (7).

Consideration of how culture plays a role in patient decision-making on health behaviors relevant to daily life, such as diet and physical activity, is important for reducing undesirable health outcomes because culture often plays a key role during the communication and cultural encounter with the healthcare provider (8, 9). This is especially true for populations of color, who are disproportionately impacted by diabetes. The focus of this study is Mexican-Americans. Therefore, several considerations must be acknowledged relative to T2DM self-management medical nutrition therapy and education for Mexican-Americans. In 2012, many Hispanics in the U.S., approximately 33.7 million, identified as being of Mexican-origin, either immigrants or U.S. born (10). Immigrants bring with them experience and knowledge from their country of origin and adjust their worldview to a new environment and culture. They impart knowledge, customs and behaviors to their children, many whom are U.S. born and live in dual culture homes. Mexican-Americans may face challenges in seeking or using health care services (11). As a result of poor understanding of the U.S. healthcare system, differences in values and beliefs, and language and communication barriers, Mexican-Americans with T2DM may face difficulty in knowing to whom and where to go to, especially for MNT and self-management education for

T2DM. In addition, trust is an important factor relative to acceptance/adherence to health recommendations (12). Therefore, healthcare providers must be aware of pertinent cultural elements to enhance efficacy of care in this and likely other ethnic groups. In this study, cultural elements are values, beliefs, ideas or concepts that are reported in the literature to possibly influence behavior. Although some cultural element may influence behaviors among different cultures, this study only aimed to identify those which were reported to influence behaviors of Mexican-Americans with type 2 diabetes.

While several T2DM interventions have been culturally adapted (13-16), characterizing these adaptations by surface and deep levels as described by Resnicow and colleagues (17), may provide a more comprehensive approach to examining and characterizing cultural elements. Surface level cultural elements involve matching the information or intervention to physical characteristics that the target population may prefer (17). Deep level cultural elements on the other hand, involve social, historical, environmental and psychological forces that influence a behavior in the target population (17). By characterizing different aspects of cultural adaptation, we can subsequently explore how these contribute to improving glycemic outcomes. This information is critical if efforts to facilitate the prevention or amelioration of the many debilitating complications of uncontrolled T2DM in the Mexican-American population are to be adequately addressed by healthcare professionals such as RDNs.

The long-term goal is for the results of this study to facilitate culturally relevant T2DM education for Mexican-Americans regarding medical nutrition therapy, physical activity and other behavioral aspects to maximize the achievement of glycemic control. The objective of the study is to add meaningful insight into culturally relevant aspects necessary for the development and/or adaptation of medical nutrition therapy and/or education (diet and physical activity) for

T2DM self-management in Mexican-Americans. This study examined the following three specific aims which are also summarized in Table 1.1.

B. Specific Aims

1. Aim 1

Identify and characterize cultural perceptions relevant to diet and physical activity for self-management education by Mexican-American adults with T2DM with an in-depth exploration of the published qualitative literature. This aim is guided by the following research question:

1. What are patient-specific cultural elements related to diet and physical activity that are reported by Mexican-American adults with T2DM?

2. Aim 2

Characterize the perceptions of RDNs who specialize in T2DM counseling with

Mexican-American adults on cultural elements related to diet and physical activity for self-

management education. This aim is guided by the following research questions:

- 1. What are RDNs' perceptions about culture-specific elements reported by Mexican-American adults with T2DM on diet and physical activity for self-management?
- 2. How do RDNs who provide T2DM self-management education to Mexican-American adults use culture-specific elements to facilitate the achievement of diet and physical activity goals?
- 3. What professional/experiential factors in general are influential among these targeted RDNS for cultural awareness/skills (not specific to T2DM and/or Mexican-Americans)?

3. Aim 3

Evaluate qualitatively the extent to which cultural elements are incorporated in a sample

of T2DM self-management intervention curricula that are used with Mexican-American adults.

This aim is guided by the following research questions:

- 1. What are the most commonly integrated surface and deep level cultural elements related to diet and physical activity in curricula for T2DM self-management interventions for Mexican-American adults?
- 4. How are cultural elements related to diet and physical activity integrated into curricula adapted for T2DM self-management intervention curricula?

C. Significance

The current research is innovative in that it is the first to examine and compare cultural elements for diet and physical activity cultural adaptation of T2DM self-management interventions specifically for Mexican-Americans from three different perspectives: the patient, the RDN and practice-based curricula. The findings will guide culturally adapted T2DM self-management interventions that engage Mexican-Americans in diet and physical activity behavior change to enhance glycemic control, and empower healthcare professionals, specifically RDNs, to improve their skills for providing culturally relevant education. Furthermore, it is expected that future self-management intervention research for Mexican-Americans with T2DM will engage a more culturally relevant approach. Even though not an outcome in this research project, the goal of this research is to ultimately facilitate T2DM self-management behavior adherence and hence control in this population.

Research Questions	Design and Variables	Participants/Content	Analysis			
Aim 1: Identify and characterize cultural perceptions relevant to diet and physical activity for self-management education by						
Mexican-American adults with	T2DM with an in-depth explore	ation of published qualitative literature.				
1. What are patient-specific cultural elements related to diet and physical activity that are reported by Mexican-American adults with diagnosed T2DM?	 Systematic review A list of cultural elements was generated and defined by researcher and research assistant using content analysis approach Quality of study using Critical Appraisal Skills Programme (CASP) Qualitative Checklist 	 Peer reviewed studies meeting the first two criteria* AND any other two key terms listed thereafter: Type 2 diabetes* Hispanic, Latino, and/or Mexican-American* Culture, cultural, culturally, culturally sensitive, and/or culturally competent Barriers, facilitators, perspective, adapted, beliefs, and/or health beliefs Nutrition, food, eating, and/or diet Physical activity, leisure activity and/or exercise 	 Qualitative content analysis was used to identify and generate definitions of cultural elements 			

Table 1.1 Study aims and objectives, design, variables, participants and analysis.

Table 1.1 (cont'd)

Aim 2: Characterize the perceptions of RDNs who specialize in T2DM counseling with Mexican-American adults on cultural elements related to diet and physical activity for self-management education.

1.	What are RDNs' perceptions about culture- specific elements reported by Mexican-American adults with T2DM on diet and physical activity for self-management?	 Cross-sectional e- mail survey Rating of cultural elements Demographics Cultural Competency Assessment Instrument 	•	RDNs who meet the following criteria: ○ RDNs status for ≥1 year ○ Working with Mexican- Americans in diabetes education ≥1 year	•	Exploratory factor analysis of cultural element themes used to examine relationships of themes Demographic variables were analyzed using descriptive statistics
2.	How do RDNs who provide T2DM self- management education to Mexican-American adults use culture-specific elements to facilitate the achievement of diet and physical activity goals?	 Cross-sectional e-mail survey Demographics 	•	RDNs who meet the following criteria: \circ RDN status for ≥ 1 year Working with Mexican- Americans in diabetes education ≥ 1 year	•	A cluster analysis was used to explore associations between demographics and use of cultural element themes
3.	What professional/ experiential factors in general are influential among these targeted RDNS for cultural awareness/skills (not specific to T2DM and/or Mexican-Americans)?	Cultural Competency Assessment Instrument	•	RDNs who meet the following criteria: ○ RDNs status for ≥1 year ○ Working with Mexican-Americans in diabetes education ≥1 year	•	A cluster analysis was used to explore associations between demographics, professional experience and cultural awareness/skill

 Table 1.1 (cont'd)

 Aim 3: Qualitatively evaluate the extent to which cultural elements are incorporated in a sample of T2DM self-management intervention curricula that are used with Mexican-American adults.

1.	What are the most commonly integrated surface and deep level cultural elements related to diet and physical activity in curricula for T2DM self- management interventions for Mexican-American adults?	 Deconstruction T2 cut add Ma Va for we cut from 	evelop protocol for ntent analysis of DM Intervention rricula culturally apted or developed for exican-Americans riable and definitions the coding protocol ere derived using Itural element themes om Aim 1	•	Diabetes Intervention Curricula for Mexican-Americans published since the year 2000 Request from authors in published studies that meet criteria: Intervention where outcome(s) reported must include subject ethnic demographics that indicate majority (>50%) of participants were Mexican-American ethnicity Objectives include those related to changes in behavior specific to diet and physical activity for T2DM self-management Statement or explanation of how the intervention targets Mexican- Americans	•	Descriptive statistics were used to describe cultural element themes
2.	How are cultural elements related to diet and physical activity integrated into curricula adapted for T2DM self-management intervention curricula?	 Cu fou Ou int cut 	lltural element themes and in curricula atcomes of erventions used in rricula • Change in hemoglobin A1c • Dietary behaviors • Physical activity behaviors	•	Studies published since the year 2000 were included • Intervention where outcome(s) reported must include subject ethnic demographics indicate majority (>50%) of participants were of Mexican-American ethnicity	•	Descriptive statistics were used to describe cultural element themes and intervention outcomes

CHAPTER 2 – Review of Literature

The following sections review the evidence and rationale for this study. The first section introduces the concept of the magnitude of the diabetes problem in Hispanics, specifically Mexican-Americans. Next, the significance of self-management recommendations and associative factors are named. Finally, diabetes self-management interventions targeting Mexican-Americans are examined, specifically if and how cultural elements are incorporated.

A. Diabetes Mellitus in Hispanics

Diabetes mellitus is diagnosed by plasma glucose levels above normal range. These criteria include fasting plasma glucose equal to or above 126 milligrams per deciliter (mg/dL), Hemoglobin A1C of 6.5% or greater, a 2-hour oral glucose tolerance test with results of above 200mg/dL or classic diabetes symptoms (polyuria, polydipsia or polyphagia) combined with an elevated random plasma glucose above 200mg/dL (18).

There are three types of diabetes. Type 1 diabetes results from a complete loss of production of insulin due to destruction of the beta cells in the pancreas and is usually diagnosed before the age of 18 (18). Gestational diabetes mellitus is where elevated glucose levels are diagnosed during pregnancy and is characterized by not being present prior to the pregnancy (18). T2DM, the focus in this research, is caused by a decreased production of insulin or an increased resistance to insulin produced by the pancreas (18). Health complications occur in all three types when glucose levels are not maintained within the normal range over time.

The Hispanic population is the fastest growing and projected to represent more than a quarter of the U.S. population by the year 2060 (19). This population is also disproportionately burdened by diet-related diseases such as T2DM and cardiovascular disease compared to the overall U.S. population (11, 20). One epidemiological study showed that one in two children of

Hispanic ethnicity born in the year 2000 will develop T2DM in their lifetime, an alarming statistic for the future health status of Hispanics in the U.S. (21).

There are several factors cited as being associated with T2DM prevalence among U.S. Hispanics. Some of these include age, ethnicity, years lived in the U.S., education and income (22). A study that examined Hispanic subgroups in the U.S. using data from the Hispanic Community Health Study and Study of Latinos showed that there is a wide range of prevalence (10.2-21.2%) of T2DM (22). The highest prevalence was among those who were mixed/other (21.2%), Mexican (18.3%), and tied for third were Dominican and Puerto Rican (18.1%). Differences by gender also appeared with Mexican men having the second highest prevalence of T2DM (18.7%) after mixed/other (19.6%) (22). The Mexican-American Hispanic subgroup is the most prominent in the U.S. and the individual group most severely impacted by T2DM (23, 24), with prevalence rates almost double to that of the current overall T2DM prevalence in the U.S., 9.3% (25).

To ameliorate the problem, it is important to understand the diversity among Hispanic subgroups and study how cultural values and beliefs can translate into health behaviors that support prevention or management of this serious disease. The following section describes selfmanagement behaviors established as evidenced-based practice and a synopsis on findings from studies with Hispanics and/or Mexican-Americans.

B. Lifestyle-Related Diabetes Self-Management Recommendations

The American Diabetes Association (ADA) updates nutrition and medical nutrition therapy interventions for diabetes annually based on primary and secondary factors that can reduce complications, and tertiary factors that can reduce morbidity and mortality (26). These guidelines are based on several landmark studies in addition to more recent findings on diabetes

prevention and treatment. Landmark studies demonstrated that individuals who performed diabetes self-management behaviors were able to maintain glycemic control A1C of <7%, defined as by the American Diabetes Association (5, 27). For individuals with pre-diabetes, defined as fasting plasma glucose of 100 mg/dL to 125 mg/dL fasting glucose or A1C range of 5.7–6.4%, weight loss of 7% of body weight and increase in physical activity to at least 150minutes per week can prevent or delay a diagnosis of T2DM (26, 28).

The American Diabetes Association defines normal glycemic control as hemoglobin A1C (A1C) = 4-6%; the goal for A1C is < 7%, and additional action is required if A1C > 8% (3). 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. Research shows significant correlations between this measure and that of values for other indices of glycemic control such as fasting blood sugar (29, 30).

These studies resulted in medical guidelines which were subsequently translated for patient participation in self-management behaviors. These behaviors included engagement in regular physical activity, healthy eating, medication adherence, self-monitoring blood glucose, problem solving, preventing or treating acute and chronic complications and psychosocial aspects of living with T2DM (31). For persons with T2DM, eating behaviors and engagement in physical activity are daily activities integral to T2DM self-management.

The most recent physical activity recommendation for the management of T2DM is that adults perform 150 minutes per week of moderate-intensity aerobic physical activity spread over at least three days with no more than two consecutive days without physical activity (28). Results from the Diabetes Prevention Program demonstrated that a reduction of at least 7% body weight through a healthy diet and moderate intensity physical activity of 150 minutes/week reduced the

incidence of T2DM by 58% compared to the placebo group (4). Moderate intensity physical activities include brisk walking, water aerobics, and gardening (32). Therefore, physical activity is an important adjunct to disease treatment and management, but individuals with T2DM do not often meet the recommendation. Only about 21% of U.S. adults from 2005-2013 met physical activity recommendations (33, 34). Overall, 31% of individuals with T2DM in the U.S. population report no regular physical activity and 38% report less than recommended levels of physical activity (35). In the NHANES 2003-2006 sample of U.S. adults with T2DM, 25.7% of men and 10.7% of women were meeting physical activity guidelines, compared to 59.3% of men and 34.0% of women without T2DM (36).

Findings relative to physical activity levels among Hispanics are consistent in showing lower levels of self-reported leisure-time physical activity compared to non-Hispanic whites (37, 38). In the National Health Interview Survey, Mexican-Americans were most likely to report leisure-time physical activity compared to Cubans and Dominicans, who reported the least (38). In NHANES III (1988-1994), four out of ten Hispanics did not engage in any leisure time activity in the month preceding data collection, but of those who did, gardening (31.8%) and walking (30%) were the most preferred activities (37). However, in reviewing the questions relative to physical activity in this survey, specifically one open-ended question, "In the past month, have you done any other exercises, sports, or physically active hobbies not mentioned?" was not reported on which may have captured cultural preferences for physical activity (39).

Researchers have also studied other factors and their associations with participation in physical activity among Hispanics. Hispanic men are more likely to engage in physical activity as a result of their occupation (37, 40). Studies that show associations between physical activity and type of employment support this finding (12, 41, 42). Environmental and socioeconomic

factors also impact participation in physical activity (43). Among Mexican-Americans in Southern California, researchers found that safety of the neighborhood and the neighborhood cohesion were positively significantly associated with meeting leisure-time physical activity guidelines (43). It is important to consider why variability between Hispanic subgroups exists and also explore how culture plays a role, not only in preferences of leisure-time physical activities, but from a community perspective. These factors are also explored as they relate to T2DM in the next section.

With regard to diet, key eating behaviors for all U.S. adults including Hispanics with or without T2DM, relate to dietary quality, e.g. intake proportionately of carbohydrates, fat and protein as well as total calories. Nutrition therapy recommendations for management of T2DM focus on individualization and consideration of the patient's health goals, personal and cultural preferences, health literacy and numeracy, access to healthful choices, and readiness, willingness and ability to change dietary behaviors (1). Cultural preferences are an important consideration relative to dietary behaviors, especially since evidence suggests that dietary patterns among Hispanic subgroups are diverse. Siega-Riz and colleagues analyzed the nutrient composition of 24-hour dietary recalls of a population based cohort, the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) of participants recruited between 2008-2011 from four U.S. cities (44). They found that Mexican-Americans had the highest intake of Vitamin C, calcium and fiber compared to Puerto Ricans, Cubans, Dominicans, Central Americans and South Americans (44). HCHS/SOL researchers also found that Mexican-Americans had the highest intake of all grains 7.3 servings per day total, with 4.4 servings from refined grains and 2.8 servings from whole grains (44). The goal of medical nutrition therapy for T2DM is to provide support regarding healthful eating patterns with emphasis on variety and adequate

portion sizes to reach goals related to weight, glycemic control, blood pressure and lipids (1). Therefore, based on information from the HCHS/SOL study, Mexican-Americans may have greater fruit and vegetable intakes and whole grain in their diets, all important components of healthy diet. However, how this relates to T2DM management needs further exploration.

Coupled with physical activity, disease-management goals can be more attainable and sustainable. Health practitioners must address diversity among Hispanics to develop more culturally sensitive recommendations for self-management of T2DM. Medical nutrition therapy is only one component of self-management. As previously demonstrated, differences exist in diet and physical activity behaviors between Hispanics and non-Hispanics in the U.S., but it is also important to differentiate these factors among Hispanic subgroups (44). It is also important to consider within this context how culture influences self-management behaviors, especially diet and physical activity, since activities of daily life may cumulatively mitigate negative health outcomes later in life. Hence, this study focuses on Mexican-Americans in the U.S., rather than Hispanics in general. The goal is to provide more culturally relevant medical nutrition therapy and self-management education for T2DM self-management that can be provided specifically by RDNs and potentially other members of the diabetes medical care team.

C. Factors Influencing Diabetes Control in Mexican-Americans

Effective self-management is key to achieving disease control which prevents serious complications (5, 27, 45, 46). Typically, disease control is determined by blood glucose levels at less than 7% A1C which falls under maintenance within normal expected levels in an individual without diabetes (3). A1C is a measure of glycosylated hemoglobin which provides the average glucose levels from the prior 2-3 months (47). There are a multitude of factors that determine T2DM control in adults which may be magnified among Mexican-Americans due to the

disproportionately high prevalence of the disease in this population. Some of these key factors include: social, environmental and cultural factors, health beliefs and values, and cultural considerations in interventions. These factors are discussed in the following sections.

1. Social Factors

Evidence exists that race and ethnicity are associated with diabetes disparities, but there are other factors that are also strongly linked. One of these factors is income. An epidemiological survey conducted in Boston, MA of 5,503 residents 30-79 years of age indicates that Blacks and Hispanics have significantly higher odds, 2.0 and 2.4 respectively, of having T2DM compared to whites (48). However, race and ethnicity only accounted for 0.3% of the variance in the analysis, while socioeconomic status accounted for 11.0% (48). This is a consistent finding about income from other studies and an important consideration when studying Mexican Americans (49-51).

The relationship between knowledge of T2DM and glycemic control is important, but not enough for improving glycemic control (52). Although the ABCs (A1C <7%, Blood pressure <130/80 mmHg, and LDL Cholesterol <100mg/dL) of diabetes campaign was established in 1997 by the National Diabetes Education Program, a study on diabetes knowledge showed that only 48% of participants surveyed were able to state their A1C number (52). Additionally, knowledge of one's own A1C level was lowest among Mexican-Americans and greater among those of higher income and education levels (52). Therefore, income status and education level can aggravate the situation.

Low participation of Mexican-Americans in T2DM self-management interventions can also be attributed to access to healthcare. Although Mexican-Americans have one of the highest T2DM prevalence rates, they are also less likely to receive T2DM self-management education even if they have a regular healthcare provider (53). Among older Hispanic adults, 73.4% of

study participants had not participated in diabetes education (54). In a 2007 report by the Roper U.S. Diabetes Patient Market Study, only 26% of patients had seen a diabetes educator in the past 12 months, and even less had received medical nutrition therapy by a RDN, only 9.1% of 18,404 patients (55). Access to healthcare and diabetes self-management education may be available to those with insurance and/or through free programs, but these programs may not be appropriate or well-received for Mexican-Americans. Some reasons for this may be that Mexican-Americans would prefer to receive diabetes self-management education that is in the Spanish language or bilingual and relevant information may be best received if it is culturally adapted (56). Therefore, cultural considerations are important when examining social factors related to T2DM (57).

2. Environmental Factors

Several environmental factors are important in the discussion of T2DM self-management and Mexican-Americans. Two aspects that are specifically addressed as they relate to Mexican-Americans and T2DM self-management are the built environment and the nutrition transition.

Environmental aspects of diabetes self-management encompass many aspects of an individual's life including family, friends, place of employment, and the physical environment (i.e. built environment) such as parks and access to resources in neighborhoods. The built environment is a topic of interest relative to T2DM self-management because of its implications for physical activity. The built environment refers to "patterns of human behavior within the physical world, encompassing urban design (arrangement, appearance, and function of physical elements and public spaces in cities), land use (location and density of residential, commercial, and recreational structures and activities), and transportation systems (usage patterns and physical infrastructure)" (58) p.729). Some aspects of the built environment that are influential to

T2DM self-management include access to parks, recreational facilities and unhealthy food (58). Given that many Mexican-Americans may be immigrants or of immigrant parents, the physical environment is important to consider especially in how it differs from their home country since Mexico is the largest supplier of Hispanic/Latino immigrants to the U.S. due to proximity (59).

The physical environment is an important consideration in relation to what is currently happening in developing countries and countries like Mexico. These types of countries are experiencing what is referred to as the "nutrition transition," a social and economic change that supports a sedentary lifestyle and increased consumption of processed and calorie dense foods (60). Some changes had a positive effect on the incidence of stunting among children for example, in Mexico, where there was a decrease of five percentage points from 1990 to 2000. Mexico's nutrition transition has contributed to its stance as one of the most obese nations and negative change in the diet (61-63). Specifically, intake of percent of total calories from fat went from 23.5% to 30.3%. Daily fruit and vegetable intake declined by 29.3% and a 37.2% increase in consumption of sodas occurred from 1984 to 1998 (63). Not surprising, overweight and obesity rates also increased in these time frames in addition to chronic diseases including T2DM, which was estimated at 15.6% prevalence in 2001 (63, 64).

These environmental changes in the U.S. and Mexico can also influence behaviors related to T2DM self-management. For example, as Mexican culture adopts aspects of the American lifestyle, such as increased fast food sources, diet and nutrition quality are impacted as demonstrated in the previous paragraph. Another important difference to note is relative to sources of physical activity between the U.S. and Mexico. In Mexico, physical activity is part of the daily lifestyle such as commuting to work or occupation related, whereas in the U.S., physical activity is often more of a leisure time activity such as walking and commuting involves

a motor vehicle (65). Therefore, both diet and lifestyle changes in conjunction with the nutrition transition contribute to the high prevalence of T2DM.

3. Cultural Factors

Within the Hispanic population in the U.S., there is a large variation in length of exposure to mainstream cultural norms and lifestyle behaviors including diet and physical activity that depend upon factors, such as length of stay in U.S., country of birth and whether they are first, second or third generation (66, 67). These factors are sometimes cumulatively indicative of acculturation level, a psychometric construct that measures the degree of cultural transition that an individual adopts customs and norms of a new culture which they have relocated into (68). Overall, higher acculturation is often associated with negative health outcomes (69, 70), and while inconsistent, findings on the relationship of diet and acculturation of Hispanics seem to have a negative association with increased consumption of foods high in fat and sugar and foods like deserts, salty snacks, pizza and fries (71, 72). Results have varied based on the Hispanic subgroup studied, and how acculturation was measured (70, 73-76). Thus, cultural considerations warrant more in-depth studies that focus on the relationship between acculturation and diet, especially in Hispanic subgroups which have diverse dietary patterns (44).

In addition, Researchers have found that family and social support are strong cultural elements that can influence health behaviors (77) and healthy eating in Hispanic adults with T2DM (78, 79). One study reported that a lack of social support and denial about having T2DM were cultural barriers to performing self-management behaviors, including diet and physical activity for achieving diabetes control, but can be overcome through an empowerment and self-efficacy intervention (80).

Cultural considerations and physical activity is understudied among Hispanics. Findings from one study of Latina immigrants found that based on a language-based acculturation scale, those who arrived to the U.S. at younger than 25 years of age and scored higher on an English items of the acculturation scale were more likely to meet physical activity recommendations of 150 minutes per week compared to Latinas who were in the inactive category, self-reported that they do not engage in any moderate or vigorous physical activities (81). Furthermore, among these Latinas, occupation related physical activity was not associated with higher English acculturation score (81). However, in this study, occupation related physical activity was examined with a single item. A different study examining data of Mexican-Americans from NHANES 1988–1994 found that acculturation (measured by language preference) is associated with less physical inactivity during leisure time, however, these authors reported that leisure time may not be a term understood by this ethnic group. Additionally, this study looked at occupation as a predictor for physical inactivity and that it was not a significant predictor (82). One limitation of this study was that occupation-related physical activity was not measured or accounted for, and a different measure of acculturation was used from the previous study, making comparisons difficult.

Another study, which used a series of questions within the 2000 National Health Interview Survey to measure acculturation, reported that there was a strong influence of acculturation on types of leisure time physical activities such as walking and biking for errands and less standing or walking during non-leisure time for those who were more acculturated (more English language preferences) (83). More recent studies have explored transportation related physical activity and acculturation and researchers found that foreign-born Mexican-Americans are more likely to report transportation related activity compared to U.S. born

Mexican-Americans (43). Overall, a review of the literature demonstrated that similar to the relationship between diet and acculturation in general, as acculturation increases, prevalence of leisure time physical activity decreases (84).

Another study identified other examples of cultural influences on physical activity and participation in a diabetes prevention program. Among rural Arizona residents in a border town, people associated walking with having a lower income, and therefore, not a desirable behavior in their residential neighborhoods (85). This study also reported that the barrier of lack of childcare previously identified to attending the program classes was overcome by allowing and encouraging participants to bring children and grandchildren with them (85). These kinds of cultural influences are not always identified through traditional program evaluations, but by examining qualitative research conducted with Hispanics. These cultural challenges may provide insight into how behaviors are influenced by culture related influences.

4. Health Beliefs and Values

There are several beliefs and values that differ from the general U.S. population among Mexican Americans and other ethnic minorities. For example, in a study that examined dietary supplement use in the U.S., Hispanic born in the U.S. and foreign born were more likely to report that they had concerns about medication and supplement interaction (U.S. born 10.4%, foreign born 24.4% compared to whites 4.3%), but also reported that supplements were as important as taking medications (U.S. born 82.1%, foreign born 89.1% and whites 55.2%) (86).

In a study conducted with Mexican-Americans in the state of Washington, researchers found that some beliefs about the cause of T2DM included having strong emotions such as *susto* (fright), *coraje* (anger), *tristeza* (sorrow or grief) (87). They also found that participants' perceived the value of herbal or folk therapies such as *nopal* and *savila* (aloe vera) to enhance

control of T2DM and even as a potential cure (87). In another study, one-third of 126 Hispanic subjects in a T2DM self-management intervention reported using home remedies such as herbal teas (i.e. from chaya plant), garlic and aloe vera because they believed that these would lower their blood glucose levels (88). Other home therapies that have been reported to correspond to health beliefs included consumption of herbs or plants like *Chaya, espina de pochote,* and *arnica* (87). These and many others are derived from plants that are native to Mexico and/or Central America and have been used to treat different conditions by indigenous people (89). Mexican-Americans in El Paso, Texas used herbal remedies for T2DM because they believed they help control T2DM and preferred them because they were "natural" (90).

Other types of beliefs may be more regional. For example, border residents in rural Arizona stated non-physical or physiological reasons that an individual may get T2DM. These rural Arizona residents believe that T2DM can evolve from another individual wishing it on them and also by exposing the body to extreme hot and cold temperatures (85).

Another cultural value that has implications for health behavior change is *Familismo*. This value is defined as the belief that the family is more important than the individual (91, 92), and an important cultural value for this population that health care professionals can leverage to influence a patient's adherence to treatment and behavior change recommendations.

Gender is another cultural element that is observed among Hispanic/Latina women known as *marianismo*. *Marianismo* often refers to characteristics associated with the Virgin Mary in Catholicism (93). Given that the most predominant religion among U.S. Hispanics is Catholicism (94), this is an important consideration. When viewed from a negative perspective it may function as a risk factor for oppression, and from a positive perspective it may be protective towards the behavior of interest (93). Characteristics that can be identified as *marianismo*

include, "passivity, lack of agency or voice, lack of employment or career focus, and the bearing of many children" (93). A qualitative study that examined the influence of *marianismo* on beliefs about physical activity found that participants' perceived that their responsibilities as wives and mothers were above their own self-care needs (95). Similarly, *machismo* can be both positive and negative with regards to how it is reflected in behavior. In some situations, *machismo* may be negatively perceived as an attitude of "male dominance and entitlement, the abuse of others, the frequent use of profanity, and irresponsibility in meeting social obligations" (96). It can also be positively characterized as meeting "responsibility in social obligations, and by behavior that provides for the family and that protects the family from harm" (96).

In examining health beliefs and values of Mexican-Americans that may influence T2DM self-management, it is clear that studies need to provide better explanations and definitions for these. For example, intervention studies, including those reviewed in the next section, often cite using cultural adaptation techniques, but fail to provide detail on the cultural adaptations themselves. Often, descriptions are limited to describing how information gathered from focus groups and perspectives from the community stakeholders were integrated into the interventions or programs. Not all interventions or programs that report using qualitative research methods for cultural adaptation have published the qualitative findings from research with stakeholders and focus groups. Therefore, knowledge regarding the cultural elements from this step in the process of cultural adaptation is not well known. Focus group and in-depth interviews are excellent methods to examine *if and how* culture can influence diet and physical activity behaviors in Mexican-Americans, but more of these studies are needed to have a better understanding on how these factor into chronic disease, specifically T2DM self-management behavior change.

D. Cultural Interventions for Diabetes Self-Management

There have been several attempts to address T2DM self-management outcomes through "culturally adapted" interventions. It must be noted that the literature does not reflect consistency in elements that make up the "cultural" in culturally adapted interventions, possibly due to a lack of a single definition for cultural adaptation. Further, there is no universal term for what cultural adaptation means and often, the terms culturally sensitive, culturally appropriate, culturally adapted and culturally specific are used interchangeably. In the following section, a review of interventions targeting Hispanics and Mexican-Americans is presented, followed by a brief summary on what cultural adaptation of these interventions typically entail. Cultural adaptation is defined as the adaptation of interventions, developed through an evidenced-based approach, for the target audience which includes aspects of culture such as language, actions, customs, religion, beliefs, and values (17), which frames the examination of aim 1 in the current study. This definition supports the premise that a culturally adapted intervention is also culturally sensitive for the target group receiving the intervention.

1. Cultural Adaptation of Diabetes Interventions

Existing curricula have been developed for prevention of T2DM and self-management, and culturally adapted using the most common process which includes variations of using bilingual paraprofessionals, adapting for literacy levels by using visuals (videos or photographs), emphasizing the importance of family either through social support or inviting them to accompany participants to intervention activities, providing information in preferred language, addressing cultural beliefs and adapting traditional recipes to be healthier in addition to a variety of other methods.
Researchers have employed focus groups to determine what cultural aspects to include in self-management interventions (97-100), while some also hired bilingual-bicultural professionals to help ensure validity of information and channel of delivering intervention (98, 101, 102). Others used bilingual-bicultural peers to deliver the self-management intervention (103, 104). A culturally competent approach in a self-management intervention in Texas meant that the intervention was provided in the preferred language and included familiar foods as well as a social emphasis, family participation and incorporation of health beliefs (88, 98, 105). After reviewing evaluations from participants, researchers found that participants preferred to have a bilingual-bicultural health care professional (vs. a lay health worker) providing the self-management intervention (56, 88). There are hence no clear or consistent guidelines with regard to the adaptation of T2DM self-management interventions for specific cultures such as Mexican-Americans, although studies have successfully included cultural adaptations as evidenced by improved biomedical and behavioral outcomes.

2. Diabetes Self-Management Interventions for Hispanics

This section discusses interventions developed for Hispanics, without tailoring interventions for specific Hispanic subgroups. Many culturally tailored self-management interventions for Hispanics have shown positive results in improving T2DM control. However, it is not well known if these so called culturally adapted self-management interventions have long-term effects after the intervention ends with regard to changing behaviors. Nor is it clear how the cultural tailoring was done or how the cultural adaptations were deemed appropriate for populations being studied.

Some self-management interventions acknowledge the diversity of Hispanic or Latino subgroups, while others examine the results as universal. Recommendations for Hispanics or

Latinos as a group are likely insufficient to make changes in all Hispanics undergoing a selfmanagement intervention. A recent study, for example, showed that the diets of the different Hispanic subgroups in the U.S. differ in composition (44). Thus, it is important to examine literature on specific Hispanic subgroups for determining behaviors related to diet and physical activity how culture may influence these behaviors, for examining what aspects of tailoring impacts glycemic control for different subgroups. In following intervention studies, the cultural adaptations reviewed varied.

A 6-month study targeting Hispanics and non-Hispanic blacks showed that glycemic levels remained lower than baseline after 4 weekly classes on topics of diet, diabetes selfmanagement, blood glucose monitoring, and diabetes complications (106). This study reports that the program used was adapted from the National Diabetes Education Program and was delivered by bilingual staff. No other information regarding specific cultural adaptations was provided, but the program was described as culturally appropriate. From this intervention, information on how the bilingual staff delivered the program and what modifications they made would improve our understanding of the cultural adaptation process.

In a 12-week study that also examined behaviors of family members of Hispanic patients with T2DM showed favorable results in glycemic control (hemoglobin A1C) and dietary choices, but no significant changes in physical activity were found in either group (107). This study included family members to facilitate support for the patients, a common cultural element found important to Hispanics with T2DM (78, 107, 108). The description of the cultural tailoring was relative to low-literacy needs, integration of cultural beliefs and values, the use of ethnic foods and recipes and culturally relevant activities. However, these were not described in detail and attempts to find other work that was done to identify cultural adaptations were not fruitful.

One community based self-management intervention aimed at Hispanics demonstrated a significant increase in moderate to vigorous walking among participants (85). 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 (+204.5 standard deviation) to 108.9 (+160) minutes per week (85). Moderate walking also significantly increased (p<0.001) from 73.7 (+204.5) to 138.1 (+145.4) minutes per week (85). Staten et al. reported the use of a curriculum already culturally adapted, titled "Su Corazón, Su Vida" with the addition of two lessons relative to diabetes and renamed "Pasos Adelante" (85). Attempts to find what the development of or cultural adaptations in "Su Corazón, Su Vida" only led to finding a study describing the cultural adaptation process of this curriculum for other multicultural populations (109). Briefly, the steps included 1) identifying a multicultural team to identify adaptations needed, 2) use of partnerships with members of the target community to respond to proposed adaptations, 3) iterative process of obtaining feedback and making adaptations, 4) use of pilot testing, and 5) using the multicultural team approach to integrate feedback from pilot testing (109). Very little information of specific cultural adaptations was provided in this description.

These are just three examples of interventions that briefly describe a culturally adapted or tailored intervention with very little to no information on what the adaptation entailed. Because we lack the specifics on what these entail, it is difficult to draw comparisons between programs and examine which cultural adaptations are necessary.

3. Diabetes Self-Management Interventions for Mexican-Americans

There is evidence of work on interventions adapted for Mexican-Americans specifically. Despite Mexican-Americans being the largest, fastest growing Hispanic subgroup (2), they are less likely than non-Hispanic whites to participate in T2DM self-management intervention even when they have a regular healthcare provider (53, 110). Many self-management interventions have been developed for diverse populations, including Hispanics of different ethnicities. Interventions designed specifically for Mexican-Americans have incorporated several different elements that are believed to improve the efficacy of the programs. Several self-management interventions have employed peer-eductors or *promotoras* to deliver the curricula (13-16, 56, 98, 102), and all but one referenced here showed an improvement in glycemic control. In these studies, cultural adaptations mentioned provided information in Spanish if preferred by study participants, and emphasized the importance of family or family support and adaptations for low literacy levels. Again, this demonstrates limited components or combination of cultural adaptations are included or used and warrants more in-depth investigation to enhance our understanding of what is needed for maxmizing success.

4. Cultural Competency and Communication

Culture is defined as, "integrated patterns of behavior, including thoughts, verbal and nonverbal language, actions, customs, beliefs, values, and institutions of racial, ethnic religious or social groups" (111). Therefore, cultural competence is defined as, "the capacity to function in a particular way, within the context of a culturally integrated pattern of behavior as defined by the group" (111). While verbal language is often the main form of communication between individuals of different groups, cultural competence is not only practiced through verbal communication. For example, making eye contact may have different meanings to two individuals of different cultural heritage. In Chinese culture, not making eye contact symbolizes politeness and respect and this may be similar among Native Americans who are more traditional, but not among Native Americans living in more urban, modern settings (112). Health

communication is a special type of communication that is concerned with health and how individuals perceive and behave relative to issues of health (113).

In order for health communication transactions to be successful between patients and professionals, cultural competency is essential. Healthcare providers must understand the spectrum of socioeconomic and cultural factors that affect how U.S. ethnic populations, especially minority groups such as Mexican-Americans, make health decisions. Those factors relevant to daily life and their impact on behaviors necessary for T2DM self-management are especially important (8). With regard to diet and associative factors, it is desirable to have RDNs who are representative of the U.S. population, but it is not usually feasible nor sufficient. Ethnic minority populations in the U.S. are quickly growing and even when RDNs of similar ethnic backgrounds to their patients provide counseling, it does not guarantee that they are culturally sensitive (114). It is essential to provide RDNs the tools needed to address the needs of their patients/clients in a culturally competent manner since cultural factors are often key to decision-making about the self-care and lifestyle changes. Individuals living with T2DM are especially impacted because they have to make decisions regarding their health on a daily basis.

Cultural competency skills of RDNs are hypothesized to improve patient outcomes, but it is still unknown if these skills directly translate into better care for the patient. It is known however, that culturally sensitive interventions can lead to better health outcomes compared to self-management interventions that are "typical care" (115-117), which highlights the importance of determining specific cultural elements in self-management intervention curricula that lead to better outcomes. By understanding specific cultural elements that are important for better outcomes, cultural elements in curricula can be appropriately tailored. Additionally, in the case of dietary counseling effectiveness of competency training for RDNs can be enhanced.

E. Conceptual Framework

The primary purpose of this study is to identify and characterize the cultural components of T2DM diet and physical activity self-management for Mexican-Americans and how these cultural elements translate into aspects of healthcare that influence behavior changes for achieving glycemic control. The conceptual framework for this study expands on two frameworks, Resnicow's model for cultural sensitivity in public health and the Health Belief Model because these models allow for examination of cultural elements influence individual behaviors and how these subsequently impact health outcomes.

1. Resnicow's Model for Cultural Sensitivity in Public Health

Resnicow et. al. developed a framework to categorize the components of culturally sensitive health interventions which aim to change health behaviors of target populations (17). Figure 2.1 depicts a list of cultural components that are divided into two levels, both of which are predicted to have health behavior implications (110). This model breaks down cultural factors into surface and deep level cultural elements (17). The model provides a comprehensive approach to examining how cultural elements are introduced into behavioral interventions intended to improve health outcomes. Each of these levels are further explained.



Adapted from the culturally sensitive framework in public health of Resnicow, Baranowski, Ahluwalia and Braithwaite 1999.

Figure 2.1. Components of culturally sensitive interventions representing the framework for surface and deep level cultural elements from the Resnicow et. al. cultural sensitivity framework in public health.

Surface-level intervention components refer to materials and messages that match "observable, superficial characteristics of a target population" (17). Elements that fit into the surface level include language preference, channel of information delivery, settings where intervention and recruitment for intervention occur, and preferences for the ethnicity, gender, age and language of delivery agent (110). Additional surface level elements include the use of specific types of settings to administer or recruit participants (110), preference for one-on-one interventions (118), and other elements such as foods, and language (119). Some of these elements are supported by other intervention literature to be typical components of what is often referred to as cultural tailoring. One example is the use of community educators (e.g. paraprofessionals, lay health workers, *promotoras*) who are bilingual and bicultural (117, 118). Surface level influences also include food preferences. It is well known that culture largely influences lifestyle behaviors including food choices (76, 120). Food preferences are integrated into behavioral intervention for Mexican-Americans by including foods like tortillas, rice, beans, *nopales* (prickly cactus), and *chayote* (prickly pear cactus) (87, 121). Food preferences as a component of surface level, however the rationale for including these is simply to visually replace the foods in the intervention with healthier versions of those that are familiar to clients. Should there be a belief related to a food for being curative or having health-properties, this food would fall into the deep level elements as a health belief (17).

Deep-level intervention components require an in-depth "understanding of cultural, social, historical, environmental and psychological forces that influence the target health behavior in the target population" (17). Elements that make up deep level include social support and social support networks (11, 14-16), including family members and utilizing the cultural belief *familismo*, (92, 110) literacy levels (110) and a variety of other cultural beliefs on health and foods (122). Many of the cultural elements that are categorized as deep level may not often be described in quantitative studies that evaluate outcomes of interventions. Often, studies of qualitative nature corresponding to interventions are more likely to identify themes that fit into the deep level.

Two examples of deep-level components hence include *Familismo* and health beliefs. *Familismo* is defined as the belief that the family is more important than the individual (91, 123). This notion can extend beyond one's own family and extend to people who also have responsibility or provide care for an individual such as a doctor, nurse or clinic staff person. From the health belief perspective, trust in foods that have certain healing properties also falls

into this deep level element of culture. One example is that many Mexican-Americans believe that *nopales*, a common food in the Mexican diet, contains properties that help with T2DM (87).

2. The Health Belief Model

The Health Belief Model (HBM), Figure 2.2, is also used in this study to frame an explanation for health-related behaviors and how culture plays a role (124). This model proposes that an individual's likelihood of a behavior change depends on perceived susceptibility/severity of the disease, perceived threat of disease, and perceived benefits minus barriers towards behavior change. The modifying factors in the model includes age, gender, socioeconomic factors, knowledge and culture. Culture is a factor that can influence likelihood of action, individual perceptions, perceived threat and cues to action before we see the behavior of interest.



Adapted from the handbook of health behavior change, Shumaker, Ockene and Riekert., 2008.

Figure 2.2. Health Belief Model representing how culture may factor in health-related behavior change.

Studies using the HBM as a framework for explaining health-related behaviors have been successful in exploring how culture plays a role. A study that used the HBM and a health-related quality of life measure analyzed health beliefs of Latina and Asian breast cancer survivors. Results showed that the doctor-patient relationship and the powerful others (God, luck and health professionals) were key influences that affected health-related quality of life (125). The HBM in this study was paired with the health-related quality of life framework to focus on culture as a key consideration for likelihood of health-related behaviors (125). In a review study relative to barriers to cancer screening and strategies that influenced cancer screening among Hispanic women, researchers identified several cultural elements that were important for health behaviors (126). The perceived barriers included embarrassment, fear, fatalism and language; cues to action recommended were the use of lay health workers and written materials to deliver health messages, especially those considering language and channel for delivery (126). Another study also found fatalism a was a more common cultural belief among Latinos compared to non-Hispanic whites, Asians and African-Americans (127). The HBM also provides a framework for integrating acculturation and cultural values. In a review study that examined that factors that influence health-seeking behaviors for dementia, these two culture-related concepts influenced perceived benefits and modifying factors such as knowledge level and each other (128). These studies successfully explored how cultural elements play a role in health by using the HBM as a framework and identifying how culture fits into the model to better understand health-related behaviors.

3. Conceptual Model for Dissertation

By gaining a better understanding of culture using Resnicow's model for cultural sensitivity, we can culturally adapt messages and how they are delivered in self-management

interventions and programs targeting Mexican-Americans with T2DM. According to the HBM, culturally adapted messages may be better received, perceived barriers may be more easily overcome as well as trigger behavior changes towards better health. The two frameworks were selected as they both contain constructs that could enhance our understanding of salient cultural elements of counseling that predict behaviors. Figure 2.3 depicts the conceptual model for the current study that includes within the specific aims the principal constructs from Resnicow's model cultural sensitivity and the HBM where culture plays a role toward achieving desired outcomes, behavior changes, specifically for diet and physical activity that are important for T2DM self-care.



Figure 2.3. Conceptual model representing how culture impacts diet and physical activity related behavior change for type 2 diabetes self-management.

CHAPTER 3 - Methods

A. Approach for Aim 1

The first aim of this study is to identify and characterize cultural perceptions of diet and physical activity for self-management education by Mexican-American adults with T2DM. The objective of this aim is to identify culture-specific elements related to nutrition and physical activity of concern to Mexican-Americans. Additionally, if and how each of these cultural elements influence health behaviors and health outcomes is explored by characterizing cultural elements into deep and surface level using Resnicow's Conceptual Model of Cultural Sensitivity in Public Health. Secondly, the Health Belief Model is used to interpret how Mexican-Americans perceive the cultural elements.

The terms culturally tailored, culturally targeted and culturally adapted are often used interchangeably in describing approaches to making health programs, more appropriate for specific ethnic groups. Due to increasing knowledge and evidence of enhanced outcomes when accounting for culture in health interventions (116, 129, 130), several approaches have been categorized and defined. In the area of psychology, Barrera and colleagues identified four approaches to the development of preventive interventions involving ethnic subgroups (131). The following summary is from Barrera and colleagues 2011 critical analysis, p. 440, Table 1. The first is a prevention research cycle intervention that aims to "establish a theoretical and empirical foundation for intervention content and efficacy." This approach does not initially include consideration of culture. A second approach is the cultural adaptation of evidenced-based interventions. In this approach, the emphasis is on modifying interventions to improve cultural fit, but maintaining the core components of the intervention. The next approach is the investigator initiated culturally grounded intervention. This approach depends on having members of the cultural group of interest participate in the creation of the intervention materials.

And lastly, the community initiated indigenous intervention is one that reflects the values, priorities and perceptions of need in the community by a member/agent of that community (131).

Although the different approaches described in Barrera et. al. demonstrated efficacy, there is no preferred approach. The approach described by Barrera et. al. as a cultural adaptation of evidenced-based interventions is most commonly used in diabetes self-management education and medical nutrition therapy and it frames the cultural elements examined in this aim (131). To better meet the needs of Mexican-Americans diagnosed with T2DM as they relate to their disease self-management goals, cultural adaptations are reported in many interventions. Cultural adaptations for T2DM self-management interventions for Mexican-Americans employ focus groups and interviews with members of the community being served to identify what the cultural adaptations should be (101, 132-136).

Resnicow and colleagues developed a cultural sensitivity model of culturally adapting evidenced-based interventions. In Resnicow's Model for Cultural Sensitivity in Public Health, a more comprehensive approach to understanding how cultural elements should be introduced into behavioral interventions intended to enhance health outcomes is provided (17). This approach distinguishes elements of culture in surface level and deep level constructs. In T2DM self-management interventions, surface level elements can include the use of community educators or paraprofessionals who are bilingual and bicultural (117, 118), providing the intervention in a specific type of setting (110), the preference for type of interventions (119). Examples of deep level cultural elements in T2DM interventions include Mexican-American specific cultural beliefs such as *familismo*, defined as the belief that the family is more important than the individual (92, 110), and information about cultural foods that individuals attribute health

properties to such as *nopales*, commonly known as prickly pear, which Mexican-Americans believe lowers glucose levels (121). Since aim 1 seeks to identify cultural elements that Mexican-Americans with T2DM believe influence self-management efficacy, Resnicow's Model for Cultural Sensitivity in Public Health allows us to frame these cultural elements within the medical nutrition therapy context of T2DM evidence-based self-management intervention curricula. The Health Belief Model provides a framework for where to address the cultural elements that are proposed to influence health behaviors of Mexican-Americans with T2DM.

1. Research Design

An exploratory design using a content analysis approach was selected because it facilitated finding surface and deep level cultural elements previously reported by Mexican-Americans with T2DM to influence self-management behaviors for T2DM. Content analysis methodology provides a robust, reproducible approach to identify and define cultural elements identified through research, especially those which may be rooted in individuals' culture. Content analysis as described and developed by Riffe, Fico and Lacey (137), emphasizes the use of conceptual and theoretical foundations to develop the rules for coding that enhances the validity of the research. Qualitative literature of focus groups and in-depth interviews were chosen for analysis to accomplish this aim. The purpose of qualitative research is to understand, based on subjects' perceptions, phenomena that is not measured with standardized tools (138). In the area of nutrition and culture, epidemiological studies have reported trends regarding healthful and unhealthful choices, such as consumption of fruits and vegetables or differences in dietary patterns of different Hispanic subgroups in the U.S. (44, 139). There is considerable interest in understanding what leads to these trends and differences in diet patterns. Qualitative research is therefore a valuable tool for characterizing and understanding these and other health-related

trends that cannot be explained through quantitative data analysis. The goal of this aim was to aggregate concepts and ideas using evidence from qualitative studies.

2. Sample

The sample of published qualitative articles was obtained in the following steps. First, peer reviewed articles were located through search engines WebofScience, ProQuest, PubMed, SciFinder, CINAHL, and PsycINFO. The requirement was for all articles to be available in English and published since the year 2000. The year 2000 was established as a cut point to capture the most recent (10-15 years) and relevant knowledge regarding Mexican-Americans as follows. Hispanic subgroups were first identified in large nutrition related surveys such as Hispanic Health and Nutrition Examination Survey in 1982-84 (140), and interest in studying Hispanic subgroups yielded research studies in subsequent years. Recognition by the U.S. government that Hispanic subgroups differ began with the 2000 U.S. Census survey (141). Finally, a PubMed search of the term Mexican-American yielded 7,597 articles with 68.4% of these results having a publication date of 2000 to present. Abstracts of articles were examined for combinations of key terms listed below. Those designated with an asterisk were determined by the primary researcher to be required in the abstract in combination with any other two additional key terms listed, see Table 3.1.

Table 3.1 Key terms for extraction of studies.

One of the following key terms required Two additional key terms required in abstract: in abstract

- Diabetes and/or type 2 diabetes*
- Hispanic, Latino, and/or Mexican-American*
- Culture, cultural, culturally, culturally sensitive, and/or culturally competent
- Barriers, facilitators, perspective, adapted, beliefs, and/or health beliefs
- Nutrition, food, eating, and/or diet
- Physical activity, leisure activity and/or exercise

The next important consideration was that although the majority (>50%) of participants in studies self-identify as Mexican-Americans this is not always the case. For those studies where this was not clear, the authors were contacted for clarification and/or confirmation of ethnicity of study participants. Duplicate abstracts were excluded and an ancestry search (a search of the bibliography) was conducted to find potential studies missed. Abstracts meeting search criteria were collected and screened a final time. The primary researcher and a trained coder conducted the "sample" search. In order for studies to be included for analysis, researcher and coder had to agree that the study was compliant with the following question, <u>"Does this article report on a concept(s) that is culturally relevant to the behaviors for T2DM self-</u> <u>management on diet or physical activity for Mexican-Americans?"</u> If so, the study was used for content analysis. See Figure 3.1 for flow chart of literature search and selection of relevant studies.



Figure 3.1. Flow chart of literature search and selection of articles.

3. Instruments

After identifying that the peer-reviewed, qualitative articles utilizing focus groups and interviews met all the criteria, an initial cultural elements review was conducted to identify those relative to diet and physical activity for T2DM self-management. Those identified, a total of 18, were defined and described into the content analysis coding protocol.

Using a content analysis approach as described by Riffe, Fico and Lacey (137), a cultural elements coding protocol and codebook, APPENDIX A: Cultural Elements Coding Protocol and APPENDIX B: Cultural Elements Codebook, were created. The coding protocol includes subcategories under the broad categories of diet and physical activity, health beliefs, and family elements that were identified and defined based on the qualitative studies analyzed for content. The Cultural Elements Codebook depicts what the value mean for the coding. The primary researcher and the same trained undergraduate research student served as independent coders to

extract, define and appraise the studies. The appraisal of the articles was completed using the adapted Critical Appraisals Skills Programme (CASP) Qualitative Checklist as part of the protocol, APPENDIX C: Adapted Critical Appraisal Skills Programme Checklist (142). The following describes procedures for each of these items.

The goal of coder training was to familiarize the coders with the material that was explored, provide instruction on how to examine the data and generate the list of and corresponding definitions of cultural elements. In this study, the undergraduate coder was provided background information on several concepts related to Mexican-American culture by the primary researcher. These concepts included the surface and deep level constructs from Resnicow (17) that provides the framework for this aim. Next, it was important to establish familiarity with concepts on nutrition and physical activity related recommendations for T2DM self-management based on the Standards of Care (6) and finally, concepts related to cultural elements that may impact diabetes self-management for Mexican-Americans as reported in the literature (87, 122, 143, 144). It is necessary to have prior knowledge of these concepts to better identify how Mexican-Americans with T2DM perceive them. This was accomplished by assigning the coder to reading assignments described above, and the coder meeting weekly with the primary researcher to clarify questions and discuss the concepts.

The second coder was also trained by the primary researcher in the procedures for using the coding protocol using Excel 2013 software. Both coders completed one practice coding session together to familiarize themselves with the use of the software and data entry. Using information from the assigned readings, discussions and meetings, the second coder and the primary researcher independently created subcategories and definitions. To establish consensus on subcategories, the weekly meetings allowed for constant comparison to finalize the coding

protocol. Details of these procedures and the protocol and codebook are found in APPENDICES A and B, respectively.

The CASP qualitative checklist adapted by Walter and colleagues in "Lay understanding of familial risk of common chronic diseases: A systematic review and synthesis of qualitative research," was used to provide a general description of the quality of the papers used in this study (142).

The adapted CASP checklist consists of 36 scored questions and an additional 16 descriptive items. The checklist and explanation of each item is found in the Cultural Elements Codebook, APPENDIX B: Cultural Elements Codebook. The researcher and second coder met to discuss and clarify understanding of the items on the checklist. Initially, researcher and coder applied the criteria to six of the research articles selected for final analysis. To establish interrater reliability, Cohen's Kappa analysis as completed for cultural element items, a measure of agreement for nominal scales in education and psychological measurements (137). Krippendorff's Alpha is recommended to measure agreement between ratio level variables, thus was used to compare inter-rater reliability of CASP total sum score (145).

4. Research Questions and Hypotheses

Research Question 1 states, "What specific cultural elements related to diet and physical activity are reported by Mexican-Americans adults with T2DM?" To answer this question, cultural element categories were examined and defined using content analysis methodology described previously. Through this approach, it was hypothesized that more cultural-specific elements that fit into the deep-level constructs compared to the surface-level constructs would be identified based on the nature of the methods used in qualitative research studies. Through this

review, a list of cultural elements related to physical activity and diet, perceived to be important for T2DM self-management for Mexican-Americans., was generated.

5. Analysis

Descriptive statistics were used to provide characteristics of the articles selected for the study. Some examples of these descriptive items include the theoretical bases of the study, the research methods, foci of study, number of subjects and quality of the study measured with the adapted CASP checklist. The results of this aim generated a list of cultural elements for subsequent aims. These cultural elements are described in detail in Chapter 4. Briefly, the cultural elements were condensed to fit under seven overarching categories that evolved from the analysis: family, emotions, health beliefs, values, physical activity, diet and communication. Within each of these categories, the items were characterized as either deep level or surface level as defined by Resnicow, et. al. (17).

Data from aim 1, specifically the cultural elements were then used to inform the tool for aim 2, which follows. Aim 2 characterizes the health professionals' perspectives, specifically the RDN's relative to cultural competency and/or considerations in medical nutrition therapy for T2DM.

B. Approach for Aim 2

The second aim of this study is to characterize the perceptions of RDNs who specialize in T2DM counseling with Mexican-American adults on cultural elements related to diet and physical activity for self-management education. The objective for this aim is to survey RDNs' perceptions relative to the importance of cultural elements related to nutrition and physical activity for T2DM self-management education for Mexican-Americans.

While other healthcare professionals also play an important role in diabetes diagnosis and education, the RDN is the key medical nutrition therapy expert. RDNs go through an accredited education program that provides education, training and skills whose mastery is tested for in five domains of the Registration Exam for Dietitians: 1) Food and nutrition, 2) Nutrition care process and model for simple and complex conditions, 3) Counseling, communication and research, 4) Food service systems, and 5) Management (146). The education and training focus on medical nutrition therapy and dietary counseling with patients in hospital and outpatient settings. RDNs are considered the ideal healthcare professional for providing medical nutrition therapy to individuals with diet-related diseases such as celiac disease, renal disease, food allergies and T2DM (1). Further, there are dietitians who specialize in providing medical nutrition therapy for specific diseases such as T2DM. These dietitians have the option to record 1,000 hours of direct patient counseling and after meeting this and other requirements, they become eligible to take a certification exam in diabetes education (147). RDNs who wish to become certified may take from two to five years to gain experience in diabetes mellitus management and complete the requirements.

Some RDNs may also have more knowledge and experience working primarily with Mexican-American patients. This depends on several factors including geographic location, e.g.

living and working in cities like Los Angeles, CA and Houston, TX, which have a large percentage of individuals of Mexican-American heritage (148). Spanish language skills, desire to develop a specialization or skill in a specific disease conditions that disproportionately affect Mexican-Americans, such as T2DM and liver diseases (149). There are several other reasons that may also influence a RDN's expertise, whether or not these skills were gained with intentionality. Therefore, in this aim, we are targeting RDNs who work with Mexican-Americans to examine several aspects of their work. First, we want to understand their perspective on strategies they utilize to counsel their patients, how they incorporate culture into counseling strategies, and to compare how they approach cultural-related concerns or ideas identified by Mexican-American patients identified in the previous aim.

To accomplish this aim, a similar approach as that used to develop a nutrition education evaluation tool titled Guide for Effective Nutrition Interventions and Education (GENIE) was completed (150). This approach used face and content validity through expert panels to develop an internet-based, self-evaluation software for "nutrition education practitioners to design high quality and effective programs" (150). The approach for GENIE was first, "to help nutrition education program planners design, self-assess, and improve programs," and second, "to help funders differentiate between programs of varying quality and drive funding decisions" (150). This GENIE study utilized experts in the area of nutrition interventions and education as reviewers to develop the items for the online tool.

The current study employed similar rationales and methods. The biggest difference is in how the list of cultural elements was generated. In GENIE, researchers used expert knowledge and input to develop the list of elements for their tool. In this study, it is important to address needs of the population of interest, Mexican-Americans. Therefore, patient reported findings

from aim 1 were used to generate the list of cultural elements and characterize them in relation to deep or surface level cultural elements according to Resnicow's Model for Cultural Sensitivity in Public Health. Secondly, RDN's perceptions of cultural elements were examined using the Health Belief Model.

It is important to consider cultural competency skills of healthcare professionals. For this study, several tools were reviewed (151-157). One frequently cited tool used in nursing was selected due to having additional components such as an assessment for social desirability and two subscales which measured awareness and behaviors related to cultural (151, 157). Although it is not clear what specific qualities and professional skills in cultural competence and cultural sensitivity are desirable in RDNs and professionals providing diabetes self-management education to Mexican-Americans are important, researchers felt it was important to include a measure for this study (151).

Therefore, the purpose of this study is to characterize the perceptions of RDNs who specialize in T2DM counseling with Mexican-American adults on cultural elements related to diet and physical activity for self-management education. The research questions for this study are examined through procedures below.

1. Research Design

A cross-sectional email questionnaire was developed and administered through organizations which could identify RDNs who met eligibility criteria. This online questionnaire was used to assess perceptions of RDNs working with Mexican-Americans with T2DM related to cultural elements. In addition, a measure of cultural competency was calculated to compare both professional and demographic characteristics of the RDN participants.

2. Sample

Eligibility criteria included current status as a RDN and has provided diabetes counseling to Mexican-American patients in the past 12 months. Exclusion criteria included that the RDN was not practicing in the past 12 months or have the RDN credential less than 12 months. RDNs were recruited through purposive sampling using the main professional organization for dietitians, the Academy of Nutrition and Dietetics. Within this organization, targeted emails were sent to the Latinos and Hispanics in Dietetics and Nutrition Member Interest Group and the Diabetes Care and Education Dietetic Practice Group, the Weight management Dietetic Practice Group and six state affiliates, the California Academy of Nutrition and Dietetics, the Texas Academy of Nutrition and Dietetics, Illinois Academy of Nutrition and Dietetics and Arizona Academy of Nutrition and Dietetics. Additionally, an application to obtain assistance from members of Dietetics Practice Based Research Network (1671) was submitted. To specifically recruit nutrition experts, these organizations were chosen resulting in a focused opportunistic sample.

The expected sample size for this study was determined in two ways, based on population of RDNs who may meet eligibility criteria and number of respondents needed for exploratory factor analysis of cultural elements. A conservative estimated number of eligible RDNs who met criteria was generated (approximately 2,005) and a conservative estimate of response rate for this group of professionals, 5%, approximately 100 was estimated based on web-based surveys of different kinds of healthcare professionals which vary on response rates (158). The 2,005 RDNs was calculated using data from the Compensation and Benefits Survey (159) and information from the Commission for Dietetic Registration subsequently described (146).

According to the Commission for Dietetic Registration 7% of practicing RDNs were professionals in the specialty of diabetes under the categories of clinical dietitian specialist and outpatient dietitian specialist. In 2013, there were a total of 89,300 RDNs, allowing for an estimate of approximately 6,251 RDNs who are specialists and work in the area of diabetes. It must be noted that dietitians who do not self-report as specialists in diabetes, are also likely to provide diabetes counseling especially those who are clinical or outpatient dietitians, 16% (14,288) and 5% (4,465), respectively. Further, dietitians who provide counseling for Mexican-Americans was also estimated by calculating the percent of RDNs who live in the following states, which have a higher density of Mexican-Americans compared to the overall average in the whole U.S., Texas (5,855/89,300=6.6%), New Mexico (419/89,300=0.01%), Arizona (1,500/89,300=1.7%) and California (9,366/89300=10.5%), with an estimate of about 17,140 or 19.2% of dietitians in the U.S. who may work with the target ethnic patient population (146). When we combine all these figures, approximately 25,004 RDNs may at some time provide diabetes counseling as part of their work.

From these percentages, the best estimates calculated were 7-28% of 25,004 (1,750-7,001) RDNs may be eligible to participate in the study. Knowing that Mexican-Americans are not exclusively living in these states, and that research studies show that patients perceive to have better care from a healthcare professional who resembles them ethnically (160), an additional 7% (250) of RDNs who self-identified as Hispanic in the Compensation and Benefits Survey (4% of 89,300 is 3,572) was added to 1,750 for an estimated potential sample size of 2,000. See table 3.2 for a breakdown of percentages.

	Sample	Calculation	n-size
		for sample	
RDNs by Specialty (28%)			
Clinical dietitian, diabetes specialist ^a , 3%	2,679	89,300 X 0.03	2,679
Outpatient dietitian, diabetes specialist ^a ,	3,572	89,300 X 0.04	6,251
4%			
Outpatient dietitian, general ^a , 5%	4,465	89,300 X 0.05	10,716
RDNs by State (19%)			
Texas ^b , 7%	5,854	5854 X 0.07	410
New Mexico ^b , 7%	419	419 X 0.07	439
Arizona ^b , 7%	1,500	1500 X 0.07	544
California ^b , 7%	9,366	9366 X 0.07	1,200
RDNs self-identified as Hispanic, (4%)	250	89,300 X 0.04 X 0.07	1,450
Possible reach through targeted emails	13,366	13,366 X 0.15	2,005
(15%)			

 Table 3.2 Estimates and calculations for target sample

The optimal way to determine sample size was not feasible prior to beginning this study, because it was unclear how many cultural elements items would be identified and created to explore perceptions of RDNs. These cultural elements were generated through aim 1 and items were measured using a Likert scale. It was recommended to have 10 respondents per item written (161). However, at the time this study was developed, it was not known how many items would be created based on findings from aim 1, and it was estimated that this would range from 15-25 items. Therefore, the range of responses needed would be 150 to 250. Due to the other estimation methods described and uncertainty related to the number of RDNs that would fit inclusion criteria, it was recommended that there be a minimum of 100 respondents to have meaningful interpretations. Estimates were reviewed with Michigan State University Center for Statistical Training.

The sample size of 125 as chosen as a goal should observations needed to be discarded due to incomplete surveys, biased responses by individual (e.g. all answers selected are the same), less than 5 minutes taken to complete survey, and other reasons that may invalidate a respondent's data. Subjects were RDNs, who have been RDNs for at least 12 months and who self-report providing diabetes counseling to Mexican-American patients in the past 12 months.

3. Survey Instruments

The online questionnaire is made up of three components, see APPENDIX D: Diabetes Counseling and Culture Questionnaire and APPENDIX E: Diabetes Counseling and Culture Questionnaire Code Key. The email questionnaire was pilot-tested with volunteer two dietetic students for clarity of questions, two human nutrition graduate students and three RDNs trained in community nutrition research. Minor modifications were make. Next, the modified instrument was reviewed by five RDNs, two are certified diabetes educators, three experts that have between 13-30 years of experience working with Hispanic communities, one is an expert in motivational interviewing, and one also worked as a health educator for migrant farm workers for 10 years prior to her last 3 years of work as an RDN in the Southern border cities in Texas. After these reviews, additional rewording and addition of items were made.

Elements identified in Aim 1 were used to develop items Q5-Q5_3, Q7-Q12, APPENDIX D: Diabetes Counseling and Culture Questionnaire. Finally, cultural competence of respondents was assessed using the Cultural Competence Assessment tool validated with health care providers (151). This tool consists of three subscales, two for cultural competence and one for social desirability. A total of 38 items from the cultural competence assessment tool were included in the questionnaire. One of the limitations of this tool is that it does not address competency skills specific to RDNs such as perceptions and stereotypes regarding dietary behaviors of individuals of different ethnic groups.

The questionnaire was entered into Qualtrics software for dissemination and data collection. This software was used to disseminate because it allows for exclusion/inclusion of

participants based on eligibility criteria determined necessary to answer the questions in this study, which were added to the beginning of the survey as the initial, see APPENDIX D: Diabetes Counseling and Culture Questionnaire Questions 2-4. Additionally, a codebook was generated, see APPENDIX E: Diabetes Counseling and Culture Questionnaire Code Key.

IRB Procedures

Study protocol was submitted through Michigan State University (MSU) institutional review board and approval of study was obtained as exempt, APPENDIX F: Michigan State University Institutional Review Board Letter of Approval. An incentive of a \$25 electronic gift card was approved for the first 125 participants in addition to a drawing for two \$50 Amazon gift cards for respondents. Funding was obtained from several MSU sources. These include funds from the College of Agriculture and Natural Resources Dissertation Completion Fellowship, Alliances for Graduate Education and the Professoriate Scholarship, College of Agriculture and Natural Resources Research Enhancement funds, Department of Food Science and Human Nutrition and the Graduate School Research Enhancement Award.

4. Research Questions and Hypotheses

The first research question was, "How are RDNs' perceptions about the importance of culture-specific elements to nutrition, physical activity and other lifestyle factors of T2DM self-management for Mexican-Americans related to the conceptual model (Resnicow, et. al. (17) and health belief model (124)?" It was hypothesized that the RDNs' perceptions regarding the importance of cultural elements for both nutrition and physical activity were positively associated to both deep level and surface level constructs included in the model.

The second research question is, "How do RDNs who provide T2DM self-management education to Mexican-American adults use culture-specific elements to facilitate the achievement

of diet and physical activity goals?" It was hypothesized that RDNs are more likely to use deeplevel cultural elements over surface-level cultural elements. We can hypothesize that deep level cultural elements had stronger relationships due to the expectation that they are more likely to change behaviors by influencing mediating factors of which ultimately affect outcomes (17). And finally, the third research question is, "Do professional or work experience factors in general influence cultural awareness/skills of these targeted RDNs (not specific to T2DM and/or Mexican-Americans)?" It was hypothesized that RDNs who received any level of cultural competence training, regardless of ethnic background were more likely to have higher cultural awareness and skills.

5. Analysis

This aim uses two types of analyses. Exploratory factor analysis was first used to examine the cultural element items written based on findings from Aim 1. Each item was measured in 5-point Likert-type scale. After exploratory factor analysis, a Varimax orthogonal rotation was completed to further clarify the patterns of cultural elements. This allowed the researchers to examine how different factors load together based on RDN's perceptions of the deep and surface level. For the deep level cultural elements, six factors were retained with an Eigen value of 1.0 or higher. The six retained factors are Emotions, Health Beliefs, Beliefs about Foods, Beliefs about herbal, folk and traditional treatments, family elements, and religion. For the surface level cultural elements, one factor was retained with an Eigen value of 1.0 or higher, and it is called food-related behaviors.

Second, a cluster analysis was used to examine the demographic and professional characteristics of RDNS. To reduce the number of variables for clustering, an exploratory factor analysis with a Varimax orthogonal rotation was completed with 51 variables. Variables that did

not load to any latent variables and those with a correlation of less than 0.10 loaded to the seven latent variables were dropped from clustering analysis. Next, the same analysis was completed with the remaining 21 variables and those that loaded to the four latent variables or had a correlation of 0.5 or less were excluded for clustering. Nine variables loaded to the four latent variables and these were used to completed clustering of RDNs into three groups. These nine variables were years as a RDN, age, years of experience in diabetes counseling, participation in cultural competency training, participation in cultural competency training through continuing education, number of patients seen monthly for diabetes counseling, number of Mexican-American patients seen monthly for diabetes counseling, work setting in an outpatient clinic tied to a hospital and work setting in an outpatient clinic not tied to a hospital. Finally, the cluster classifications were used to group RDNs and examine how RDN's perceptions of cultural elements differ by professional characteristics groupings.

Findings from aims 1 and 2 were integrated to formulate the basis for aim 3. Aim 3 seeks to examine the extent to which a sample of diabetes education curricula and research interventions specifically designed for educating Mexican-Americans with T2DM meet culture specific expectations. A description of aim 3 follows.

C. Approach for Aim 3

1. Introduction

Landmark studies on diabetes self-management (4, 5, 162) have paved the way for developing self-management interventions targeting ethnic populations who are disproportionately affected by T2DM, such as Mexican-Americans and African-Americans. Some randomized control trials examining the outcomes of culturally tailored self-management interventions have also been completed, and these trials have shown improved diabetes control and outcomes (97, 102, 163). However, there is still a lack of standard criteria for what cultural tailoring entails making it difficult to develop recommendations on how to develop such culture specific self-management interventions (164).

The terms culturally tailored, culturally targeted and culturally adapted are often used interchangeably in describing approaches for adding culture specific information in health programs, especially interventions. The need for understanding these terms has led researchers to better define and categorize the different approaches used by examining different health interventions (116, 129, 130). To better meet the needs of target ethnic populations, such as Mexican-Americans, for achieving self-management goals related to T2DM outcomes, many interventions undergo cultural adaptations that typically employ focus groups, interviewing members of the community being served, stakeholders and leaders to verify input into the process (56, 101, 132-136).

One particular model relative to cultural sensitivity was developed by Resnicow and colleagues and it identifies the types of cultural elements integrated into interventions (17). This model adapts evidenced-based interventions for specific cultures and examines the types of cultural elements introduced into behavioral interventions intended to enhance health outcomes

(17). According to this model, there are two constructs for elements of culture, surface level and deep level. Surface level elements include the use of community educators or paraprofessionals who are bilingual and bicultural (117, 118), the setting where the intervention is delivered (110), addressing preferences for one-on-one versus group delivery (118), and others such as language and the use of cultural foods in the intervention materials (119). Examples of deep level cultural elements include addressing aspects such as the value of *familismo* (the belief that the family is more important than the individual) (92, 110) and addressing health beliefs about foods for example, *nopales*, commonly known as prickly pear, which is believed to lower glucose levels (121). Resnicow's Model for Cultural Sensitivity in Public Health allows us to frame cultural elements examined in the current study within the medical nutrition therapy context of interest relative to T2DM self-management.

Aim 3 seeks to determine the extent to which T2DM self-management intervention curricula, utilized in published research, incorporate culture-specific diet and physical activity elements for Mexican-Americans. The objective is to use Resnicow's model (17) to compare and describe surface and deep level culture-specific elements related to nutrition, physical activity and other lifestyle factors in T2DM interventions that have targeted Mexican-American adults. These cultural elements are examined by surface and deep levels, and by the constructs of the Health Belief Model to gain an in-depth understanding of how T2DM self-management behaviors are influenced by cultural values and beliefs. As previously described, the current study focuses on interventions considered to be "culturally adapted" evidenced based interventions.

2. Research Design

Content analysis was conducted to explore characteristics of diabetes self-management intervention curricula targeting Mexican-Americans. Cultural characteristics of interest included two broad categories of cultural elements, surface and deep level in addition to examining how these also align with the Health Belief Model as defined previously.

3. Sample

The sample of T2DM self-management intervention curricula was obtained by several methods. First, a list of self-management interventions was generated using a key word search of diabetes self-management interventions targeting Mexican-American adults published in peer reviewed journals and in ProQuest theses and dissertations published since the year 2000. Additionally, citations of these research studies were reviewed for studies that specifically fit the self-management intervention curricula criteria. A comprehensive list was generated; authors or principal investigators, and/or centers where self-management interventions were/are occurring were contacted via email, with a follow-up by email or phone (if available) one week after first contact. Up to four attempts were made to obtain curricula and any leads were followed up each week, by email and/or phone.

The following characteristics were used as inclusion criteria for T2DM intervention curricula.

- 1. Objectives related to changes in behavior specific to diet and physical activity for T2DM self-management
- 2. A statement that the intervention is for Mexican-Americans; when no explicit statement related to target population was available, the intervention was included if the ethnic demographics indicated majority (>50%) of participants in the intervention were of Mexican-American ethnicity; if ethnicity was unclear, attempts to reach the author(s) were made regarding the ethnic makeup of the study participants
- 3. Studies published since the year 2000

The focus of this study is T2DM, the more common type of diabetes among all Americans and especially Mexican-Americans, and because it is a diet-related disease, often associated with overweight/obesity (18). The most commonly used marker of T2DM management is glycosylated hemoglobin (A1C). It indicates average glucose levels of the prior three months (47). This marker is commonly utilized by physicians to diagnose, monitor, and make medication adjustments in patients with type 1 and T2DM (18). Thus, the outcome variable of interest was positive change in A1C level.

When available, other dependent variables that were used to assess the outcomes of the self-management intervention studies reviewed included change in body mass index (BMI), changes in dietary behavior and diet composition, and changes in participation in physical activity. Diet recommendations typically include limiting intake of calories, fat, sugar and/or carbohydrates or intake of foods high in solid fats, alcohol, and added sugar and looking for increases in intake of fruits and vegetables. Therefore, these dietary behaviors are of interest due to their association with glycemic control (165). Similarly, increase in physical activity is associated with improved glycemic control. Therefore, findings showing changes in physical activity behaviors include participation in physical activity in types of activities, amount of time or number of days engaging in activities (165).

Independent variables of interest included the two broad categories, surface and deep level cultural elements. These variables were assessed by frequency of appearance in curricula. The surface level cultural elements were selected based on the literature. Surface level cultural elements were included using broad definitions and any new or more specific elements that were identified were added during coder meetings. Some examples of these surface level cultural elements are below. New elements that were defined were added during coder meetings per

coding protocol, APPENDIX G: Content Analysis Coding Protocol and also to APPENDIX H:

Content Analysis Codebook.

- Language(s): The languages the curricula are available in to provide the intervention, English, Spanish, or both.
- Familiar foods: The curricula explicitly provide examples of foods that are common among Mexican-Americans as reported in the literature (i.e. *nopales, tortillas*, etc.).
- Visuals: Visuals recommended or provided in the curriculum that are not foods. These could include *foto-novelas* (picture/cartoon style story books), photographs of what would appear to be Mexican-American people, people participating in folkloric dancing, etc.
- Peer-delivery: The curriculum indicates that the program should be delivered by a peer of the participants, implying that these individuals be of the same ethnicity as the participants. These peer participants are not usually trained healthcare professionals, but are supervised or guided by trained healthcare professionals such as physicians, nurses or RDNs.
- Bilingual Professionals: The curriculum indicates that the program should be delivered by a bilingual professional with training. These trained professionals included but were not limited to physicians, nurses or RDNs.

Deep level cultural elements included were items from the seven categories previously

mentioned in Aim 1 (Family, health beliefs, emotions, values, diet, physical activity and

communication) and are defined in more detail in chapter 4. Some examples of these deep level

cultural elements are below.

- Family: The curriculum should explicitly state that there was participation of family in the program, for example suggesting that a family member attend the self-management intervention with the participant or requests for at-home participation through dialogue with the participant.
- Health beliefs: The curriculum should explicitly include dialogue regarding health beliefs with participants.
 - Alternately, dialogue regarding specific health beliefs such as *susto/fright*, *curandero/traditional healer*, *etc*. can be included.

Additional surface and deep level cultural elements were added to the coding protocol if

the elements appeared at least two times and did not fit existing variables. Other items of interest

relative to the curricula included the total number of lessons/sessions per intervention;

recommended time for completion; other self-management topics addressed such as eye care,

foot care, medication adherence, self-monitoring with blood glucose meter, problem solving (treatments for acute hypo and hyperglycemia events), and recommendations regarding participation in diet and physical activity.

Coding was conducted independently by two trained undergraduate research assistants, trained by the primary researcher with intermediate level Spanish skills. Spanish reading skills were assessed prior to coding commencement by the bilingual primary researcher. The coder training also included reading assignments on background information on several concepts related to Mexican-American culture. These concepts included: the surface and deep level constructs from Resnicow (17) that provides the framework for this aim; next, concepts on nutrition and physical activity related recommendations for T2DM self-management based on the Standards of Care (6); and finally, concepts related to cultural elements that may impact diabetes self-management for Mexican-Americans as reported in the literature. It was necessary to have prior knowledge of these concepts to better identify how Mexican-Americans with T2DM perceive them. This was accomplished by assigning the coder to reading assignments described above, and holding weekly meetings with the primary researcher to clarify questions and discuss the concepts. The primary researcher trained coders, and met with them four times to review coding protocol and make changes to a definitions and cultural elements codebook, APPENDIX B: Cultural Elements Codebook. At the first meeting, coders were provided with one curriculum, which was not part of the curricula for final analysis. Subsequently, a meeting was held to review items and clarify definition that were not clear. At each subsequent meeting, discrepancies relative to cultural elements between coders for each curriculum were discussed and clarified.
4. Research Questions and Hypotheses

The first research question is "What are the most common surface level and deep level cultural elements integrated into T2DM self-management interventions for Mexican-Americans?" Research interventions demonstrate effective cultural adaption of interventions targeting Mexican-Americans through lifestyle changes (88, 102, 135, 166). These cultural adaptions include surface level elements such as language (88, 116, 166), visuals such as picture-based food guides or models (102, 116, 135), recipes (167), bilingual professional staff (88) and peer-delivery (85, 103, 168, 169).

Deep level adaptations included topics such as addressing family preferences or participation (88, 102), and addressing health beliefs (85, 88). Understanding of health and health beliefs from a Mexican-American culture perspective may differ from a RDN's beliefs. For example, a survey of Mexican-Americans with T2DM showed that participants who scored higher for use of Spanish compared to English were 2.53 times more likely to believe that T2DM is caused by *susto* (an event that caused intense fright or trauma) (170).

Some T2DM self-management intervention curricula have taken some culture-specific beliefs into account, but it is unknown which of these influence T2DM self-management behaviors and outcomes. Based on review of culturally adapted interventions, it was hypothesized that self-management interventions incorporating more surface level versus deep level cultural elements, mainly because it is unclear which cultural elements lead to long-term behavior change in self-management interventions. Additionally, the Health Belief Model is used to examine how cultural elements identified in this aim are perceived in relation to achieving curriculum goals and outcomes.

The second research question is, "How do diabetes self-management intervention outcomes relate to cultural elements in diabetes self-management interventions for Mexican-Americans?" This study reports change in interventions outcomes reported in studies and includes mean change in the A1C test, change in diet (i.e. decreased intake of calories, fat, carbohydrates and/or sugar, decreased intake of foods such as solid fats, alcohol, and added sugar; change intake of fruits and vegetables) and positive change in physical activity behaviors (i.e. change in participation in physical activity as reported by change in time per week and/or change in number of days participating in physical activity). We can speculate that more studies incorporate surface level cultural elements compared to deep level, but those with deep level are more likely have positive results in more than one outcome of interest. Additionally, it was hypothesized that health beliefs identified were discussed under the construct of perceived barriers to desirable health behaviors according to the Health Belief Model. This may be due to several reasons including the lack of understanding of cultural health beliefs and their role in influencing health-related behaviors such as nutrition and physical activity. Given the variability in self-management interventions and in participants, as well as, non-random sampling, we cannot make predictions from these findings.

5. Analysis

Descriptive statistics for the overall sample of curricula obtained was used to describe the number of lessons per intervention, number of objectives related to diet and physical activity, target population defined for intervention, language(s) available for delivery, other self-management topics such as eye care, foot care, medication adherence, self-monitoring with blood glucose meter, problem solving for hyper- and hypoglycemia and outcomes measured post-intervention.

Data analysis involved categorization of items coded in the curricula by deep and surface level elements and frequency of appearance of these elements. Other outcomes related to curriculum examined were extracted from published studies corresponding to these curricula. Data analysis for the second research question involves the frequency of appearance of the elements extracted from published studies and the mean change in A1C or other behavior outcomes reported.

Findings from aims 1, 2 and 3 follow. Additionally, Chapter 7 provides a summary of each aim, overall conclusions and implications for future research.

CHAPTER 4 – Defining cultural perspectives of disease self-management by Mexican-Americans with type 2 diabetes

Target Journal: Ethnicity and Disease **A. Abstract**

Objective: Diet and physical activity (PA) are two important aspects of self-management for Type 2 diabetes mellitus (T2DM), a serious concern among Mexican-Americans, who are increasing in numbers and aging in the U.S. Culture plays an integral role in this population relative to beliefs and attitudes towards western medicine approaches and traditional or folk approaches for treating T2DM, especially with regard to diet and physical activity (PA). The objective of this study was to identify and characterize patient perceived cultural perceptions relevant to diet and PA self-management education for Mexican-American adults with T2DM through an in-depth exploration of the published qualitative literature.

Methods: A literature review search was conducted to identify research studies that met the following criteria: majority (>50%) of participants included participants self-identified as Mexican-American and reported findings on concept(s) culturally relevant to T2DM selfmanagement diet and/or PA behaviors for Mexican-Americans. Content analysis was used by two coders to identify and define cultural elements as reported by study participants in the results section of the selected studies.

Results: Interrater reliability between the two coders, assessed with Cohen's Kappa coefficient, ranged from 0.67-1. From the 38 cultural elements identified and characterized in a total of 19 studies, the top surface level elements mostly commonly found in the studies were food habits (n=15/19), food preferences (n=14/19), use or acquisition of nutrition knowledge (11/19) and healthcare provider preferences (11/19). The top three deep level elements were

general health beliefs or attitudes (n=19/19), beliefs or attitudes about foods in general (n=17/19) and family turmoil (n=14/19). PA related elements were rarely found in the research studies.

Conclusions: A total of 38 cultural elements perceived important by Mexican-Americans with T2DM were identified and defined through the systematic review and content analysis methodology as important considerations for culturally sensitive T2DM self-management education. Further research regarding less understood cultural elements should be examined in the context of Mexican-American identity and T2DM such as, family turmoil.

B. Introduction

Mexican-Americans are disproportionately at risk for T2DM in the U.S. (23, 24) with prevalence rates almost double to that of the current overall T2DM prevalence in the U.S., 9.3% (25). Key to decreasing serious complication of the disease is adherence to self-management behaviors that are shown to improve patient outcomes. Additionally, culturally adapted interventions are shown to improve glycemic outcome (106, 107), but it is unclear which and how these cultural adaptations influence self-management behaviors relative to diet and physical activity.

Many research and healthcare programs have subsequently been developed to facilitate disease management or prevention. It is however imperative that cultural adaptations be considered for different ethnic groups. Cultural adaptations typically employ focus groups, interviewing members of the community being served, stakeholders and leaders to identify what and how to integrate these cultural adaptations (56, 101, 132-136). The terms culturally tailored, culturally targeted and culturally adapted are often used interchangeably in describing approaches to making health programs, such as those for T2DM self-management, more appropriate for specific ethnic groups. Due to increasing knowledge and evidence of enhanced outcomes when accounting for culture in health interventions (116, 129, 130), researchers have begun to define and categorize the different approaches. In the area of psychology, Barrera and colleagues identified four approaches to the development of health interventions involving ethnic subgroups (131).

The following are descriptions of these approaches as defined by Barrera and colleagues using a critical analysis approach, p. 440, Table 1 (131). The first approach is a prevention research cycle intervention that aims to "establish a theoretical and empirical foundation for

intervention content and efficacy." This approach does not initially include consideration of culture. A second approach is the cultural adaptation of evidenced-based interventions. In this approach, the emphasis is on modifying interventions to improve cultural fit, but maintaining the core components of the intervention. The next approach is the investigator initiated culturally grounded intervention. This approach depends on having members of the cultural group of interest participate in the creation of the intervention materials. Lastly, the community initiated indigenous intervention reflects on the values, priorities and perceptions of needs by a member/agent of the community in question.

The approach that is most commonly used in diabetes self-management education and medical nutrition therapy is the cultural adaptation of evidenced-based interventions which frames the cultural elements examined in this study. Resnicow and colleagues (1999) developed a cultural sensitivity model of adapting evidenced-based interventions for specific cultures. This model, Resnicow's Model for Cultural Sensitivity in Public Health, provides a comprehensive approach to understanding how cultural elements should be introduced into behavioral interventions for disease prevention intended to enhance health outcomes (17). This approach distinguishes elements of culture as surface level and deep level constructs. In T2DM selfmanagement interventions for Mexican-Americans, surface level elements can include the use of community educators or paraprofessionals who are bilingual and bicultural (117, 118), providing the intervention in a specific type of setting (110), the preference for type of intervention such as one-on-one (118), and other modifications such as use of cultural food models and language (119). Examples of deep level cultural elements in T2DM interventions for this target population include the acknowledgement of cultural beliefs such as familismo, defined as the belief that the family is more important than the individual (92, 110) and information about foods that

individuals attribute health properties to, such as *nopales*, commonly known as prickly pear, which is believed to lower glucose levels (121). Since the current study seeks to identify several cultural elements that Mexican-Americans with T2DM believe influence diet and PA self-management efficacy, Resnicow's Model for Cultural Sensitivity in Public Health allows us to frame these cultural elements within the medical nutrition therapy context of interest.

The aim of this study is to identify and characterize cultural perceptions relevant to diet and physical activity for self-management education by Mexican-American adults with T2DM. Additionally, we explore if and how each of these cultural elements influence health behaviors and health outcomes by characterizing cultural elements into deep and surface level using Resnicow's Conceptual Model of Cultural Sensitivity in Public Health. Secondly, we use the Health Belief Model (HBM) to interpret how Mexican-Americans perceive the cultural elements. A goal of this aim is to aggregate concepts and ideas using evidence from qualitative studies that can be used to examine how culture influences dietary behaviors and PA among the target population.

The first research question states, "What specific cultural elements related to diet and PA are reported by Mexican-American adults with T2DM?" To answer this question, cultural element categories were examined and defined using content analysis methodology as described by Riffe, Fico and Lacey, 2014 (137). Through this approach, we can hypothesize that more cultural-specific elements fit into Resnicow's model for cultural sensitivity as the deep level compared to the surface level constructs. It is speculated that this is due to the type of research studies included in this review, qualitative research versus quantitative research. Qualitative research often provides researchers with an opportunity to identify phenomena that is not easily measured compared to quantitative research. Through this review, a list of important cultural

elements related to PA and diet for T2DM self-management for Mexican-Americans was generated.

C. Methods

An exploratory, qualitative study design using a content analysis approach was used to find surface and deep level cultural elements relative to diet and PA previously reported by Mexican-Americans with T2DM to influence self-management behaviors recommended for T2DM self-management. Qualitative literature findings of focus groups and in-depth interviews were chosen to accomplish this aim. Additionally, content analysis methodology was used to understand patterns relative to distinct cultural elements reported in the literature previously and any additional ones that researchers identified as different, but important to the subjects in the studies.

The purpose of qualitative research is to understand phenomena that has no standardized measured from the perspective of research subjects (138). In the area of nutrition and culture, epidemiological studies report trends regarding healthful and unhealthful choices, such as consumption of fruits and vegetables or differences in dietary patterns of different Hispanic subgroups in the U.S. (44, 139). There is considerable interest in understanding what motivates to these trends or differences in diet patterns. Qualitative research is therefore a valuable tool for characterizing and understanding these and other health-related trends that cannot be explained using quantitative data. Additionally, content analysis methodology provides a robust, reproducible approach to identify and define cultural elements identified through research, especially those which may be rooted in culture (137, 171).

Criteria were developed for a consistent, systematic approach for sampling. First, abstracts of peer-reviewed published manuscripts were examined for combinations of key terms listed below. The first criterion was that the abstracts must include one of the terms noted with an asterisk in Table 4.1, and a combination of any other two key terms listed in the second column.

Table 4.1 Key terms for study extraction.

Two additional key terms required in abstract

• Diabetes and/or type 2 diabetes*

Key terms required in abstract

- Hispanic, Latino, and/or Mexican-American*
- Culture, cultural, culturally, culturally sensitive, and/or culturally competent
- Barriers, facilitators, perspective, adapted, beliefs, and/or health beliefs
- Nutrition, food, eating, and/or diet
- Physical activity, leisure activity and/or exercise

The next criterion was that the majority (>50%) of participants in the studies selfidentified as Mexican-Americans. For those for which this was not clear, the author was contacted for clarification and/or confirmation of ethnicity of study participants. Duplicate abstracts were excluded and an ancestry search (a search of the bibliography) was conducted to find potential studies missed. Abstracts meeting search criteria were collected and the screened a final time. In order for manuscripts to be included for analysis, the primary researcher and a trained coder established consensus relative to the following question for content analysis, "<u>Does</u> <u>this article report on a concept(s) that is culturally relevant to the behaviors for T2DM self-</u> <u>management on diet or physical activity for Mexican-Americans?</u>" See Figure 4.1 for summary of literature search and selection of manuscripts.



Figure 4.1. Summary of literature search and selection of studies.

The sample of published studies was obtained in the following steps. First, peer reviewed manuscripts were located through search engines Web of Science, PubMed, ProQuest, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). All manuscripts were available in English and published since the year 2000. The year 2000 was established as a cut-point for several reasons including capturing the most recent (10-15 years) and relevant knowledge that specifically captures Mexican-Americans as a distinct subgroup. Hispanic subgroups were first identified in large nutrition-related surveys such as the Hispanic Health and Nutrition Examination Survey in 1982-84 (140), and interest in studying these subgroups yielded research studies in subsequent years. Recognition of the differences between Hispanic subgroups by the U.S. government began with the 2000 U.S. Census survey (141). Finally, a PubMed search of the term Mexican-American yielded 7,597 articles with 68.4% of these results with a publication date of 2000 to present.

The content analysis approach facilitated the formulation of a cultural elements coding protocol (APPENDIX A: Cultural Elements Coding Protocol). This coding protocol includes subcategories under the broad categories of diet and PA that were identified and defined based on the studies. Two coders extracted, defined and finally appraised the studies. The primary author of this study and a trained undergraduate research assistant completed a preliminary review of the articles to determine if they met all criteria. An initial review was conducted to identify cultural elements relative to diet and PA for T2DM self-management and develop definitions and descriptions. Inconsistencies in coding were discussed to achieve a consensus on definitions and terminology of cultural elements. The quality appraisal of the studies was completed using the adapted Critical Appraisals Skills Programme (CASP) Qualitative Checklist as part of the protocol. The following describes procedures for each of these items.

The goal of coder training was to familiarize the coder with the material and concepts to be explored, provide instruction on how to examine the data and to generate the list of cultural elements beyond those that were previously identified by the primary researcher through review of articles that met inclusion criteria. In this study, the coder was instructed on several concepts. These include the surface and deep level constructs from Resnicow (17) that provide a framework for this aim. Next, concepts on nutrition and PA related recommendations for T2DM self-management based on the Standards of Care (18) and concepts related to cultural elements that my impact diabetes self-management for Mexican-Americans as reported in the literature. It is necessary to have prior knowledge of these concepts to better identify how Mexican-Americans with T2DM perceive these concepts. This was accomplished by assigning the coder to read assignments, having discussions regarding the concepts and holding weekly meetings to clarify questions.

The coder was trained by the primary researcher in the procedures for using the coding protocol using Excel 2013 software. Both coders completed one practice coding session together to familiarize themselves with the use of the software and data entry. Using information from the assigned readings, discussions and meetings, the coder and researcher independently created subcategories and definitions. To establish consensus on subcategories, weekly meetings were held for constant comparison to finalize the coding protocol. Details of these procedures and the coding protocol are found in APPENDIX A: Cultural Elements Coding Protocol.

The scoring system used in this study to assess the level of evidence of cultural elements identified in the studies were as follows. A rating of 0 indicated that the cultural element was not present in the manuscript, a rating of 1 indicated that the cultural element was present and stated or paraphrased by the authors. A rating of 2 indicated that the cultural element was present and a quote directly from the data was used to identify the cultural element.

The CASP qualitative checklist adapted by Walter and colleagues in "Lay understanding of familial risk of common chronic diseases: A systematic review and synthesis of qualitative research," (APPENDIX B: Cultural Elements Codebook) was used to provide a general description of the quality of the papers used in this study (142).

The adapted CASP qualitative checklist consists of 36 scoring questions and an additional 16 descriptive items. The checklist and explanation of each item is found in APPENDIX B: Cultural Elements Codebook. The primary researcher and one trained undergraduate assistant met to discuss and clarify the items on the checklist. Two types of interrater reliability measures were used. First, Cohen's Kappa coefficient is a measure of agreement for nominal scales used in education and psychological measurement (137). Cohen's kappa was used to examine interrater reliability of each scored item in the CASP checklist that was scored

(see Table 4.2). To measure agreement between a ratio level variable, such as a continuous score, Krippendorff's Alpha is recommended (145). Krippendorff's Alpha was completed to compare inter-rater reliability of total scores which is a continuous number.

The cultural elements were assigned to fit under deep level or surface level categories based on Resnicow's description of these components of public health interventions (17). Descriptive statistics were utilized to characterize the articles selected for the study. Some examples of these descriptive items include the theoretical bases for the studies, the research methods, foci of study, subjects and trustworthiness, results and relevance of the studies using the adapted CASP qualitative checklist. The results of this aim were used to develop a list of cultural elements for subsequent studies conducted by the primary researcher.

D. Results

An overview of findings for each article is included APPENDIX I: Summary of articles results, CASP checklist scores and cultural elements. The following results are presented in order of inter-reliability testing,

Inter-rater relatability testing determined the level of agreement in coding by the two independent coders for cultural elements and the CASP checklist. Table 4.2 shows inter-rater reliability testing results for the cultural elements using Cohen's Kappa. For 4 of the 44 variables (one variable was not found during coding therefore not included in calculations), the average percent agreement was 87.09 and the average Cohen's Kappa was 0.74. Although coders met to clarify operational definitions of all variables, inter-rater reliability (as evidenced by a Kappa of less than 0.70) was not reached even when recoded for some of the cultural elements. Therefore, these four cultural elements were dropped: general values or beliefs (item 26, non-health related), world views (item 27), practicalities of daily life (item 43) and personal attributes

contributing to health (item 44), listed in Table 4.2. Additionally, one more variable was dropped, food preferences related to religious beliefs, because it was only identified in one article.

Variable Code Name ^a	Percent Agreement	Expected Agreement	Kappa	Std. Err.	Z	Prob>Z
Family Elements	8	8				
1. Influence of familismo	89.47	49.58	0.79	0.17	4.56	< 0.000
2. Influence of family	94.74	41.00	0.91	0.18	5.01	< 0.000
3. Family turmoil	78.95	34.07	0.68	0.16	4.36	< 0.000
Emotion Elements						
4. Beliefs or attitude about shame	89.47	58.17	0.75	0.18	4.17	< 0.000
5. Belief or attitude about anger	84.21	43.21	0.72	0.18	3.99	< 0.000
Food Elements						
6. Food habits	84.21	36.01	0.75	0.16	4.66	< 0.000
7. Food preferences	78.95	35.73	0.67	0.17	4.04	< 0.000
8. Use or acquisition of nutrition knowledge	84.21	42.38	0.73	0.18	3.96	< 0.000
9. Lack of Nutrition Knowledge	89.47	57.34	0.75	0.17	4.49	< 0.000
10. Beliefs or attitudes about foods in general	84.21	47.09	0.70	0.17	4.07	< 0.000
11. Food preferences related to religious beliefs	100.00	90.03	1.00	0.23	4.36	< 0.000
12. Food avoidance related to religious beliefs	N/A	N/A	N/A	N/A	N/A	N/A
13. Beliefs or attitudes about <i>nopal</i> /cactus	94.74	58.17	0.87	0.18	4.88	< 0.000
14. Beliefs or attitudes about tea	89.47	59.00	0.74	0.19	3.85	0.0001
15. Belief or attitude about Mexican/cultural foods	84.21	43.77	0.72	0.16	4.46	< 0.000
Health Belief Elements						
16. Combination of traditional and western medicine	94.74	54.57	0.88	0.17	5.17	< 0.000
17. General health beliefs or attitudes	84.21	46.81	0.70	0.17	4.12	< 0.000
18. Beliefs or attitudes about herbal or complementary and	100.00	52 35	1.00	0.18	5 63	<0.000
alternative medicines	100.00	52.55	1.00	0.10	5.05	<0.000
19. Beliefs or attitudes about depression	84.21	38.23	0.74	0.17	4.44	< 0.000
20. Beliefs or attitudes about alternative treatments	94.74	60.94	0.87	0.17	5.02	< 0.000
21. Belief or attitude about fatalism	84.21	43.21	0.72	0.19	3.82	0.0001
22. Belief or attitude about <i>susto</i>	89.47	57.89	0.75	0.18	4.25	< 0.000
23. Beliefs or attitudes about diabetes medicine or insulin	84.21	39.61	0.74	0.16	4.64	< 0.000
24. Religion as treatment	89.47	64.27	0.71	0.17	4.13	< 0.000
25. Belief that Mexican/Hispanic culture may cause diabetes	94.74	51.80	0.89	0.17	5.21	< 0.0000

Table 4.2 Inter-rater reliability results for 44 cultural elements in 19 studies.

Table 4.2 (cont'd)

Values Elements						
26. General values or beliefs	73.68	56.79	0.39	0.16	2.5	0.0063
27. World views	78.95	60.94	0.46	0.17	2.66	0.0040
28. Trust and rapport	94.74	76.18	0.78	0.17	4.50	< 0.000
29. Mistrust of healthcare professionals	84.21	51.52	0.67	0.17	3.99	< 0.000
30. Belief or attitude about marianismo	84.21	48.48	0.69	0.16	4.21	< 0.000
31. Belief or attitude about <i>machismo</i>	89.47	64.27	0.71	0.17	4.13	< 0.000
Communication Elements						
32. Language considerations	100.00	50.14	1.00	0.20	5.04	< 0.000
33. Health literacy	94.74	44.60	0.91	0.19	4.80	< 0.000
Physical Activity Elements						
34. Physical activity habits	84.21	49.03	0.69	0.17	4.08	< 0.000
35. Physical activity preferences	94.74	76.45	0.78	0.19	4.08	< 0.000
36. Beliefs or attitudes related to physical activity	84.21	37.40	0.75	0.16	4.54	< 0.000
Healthcare System Elements						
37. Beliefs or attitudes towards diabetes education	89.47	54.02	0.77	0.20	3.93	< 0.000
38. Healthcare provider support	94.74	72.02	0.81	0.17	4.78	< 0.000
39. Lack of healthcare provider support	84.21	39.61	0.74	0.17	4.40	< 0.000
40. Healthcare provider preferences	84.21	40.17	0.74	0.16	4.49	< 0.000
Other Elements						
41. Cost related to diabetes	89.47	54.29	0.77	0.17	4.63	< 0.000
42. Involvement by friends, excluding family members	89.47	54.57	0.77	0.17	4.49	< 0.000
43. Practicalities of daily life	52.63	28.53	0.34	0.13	2.69	0.0036
44. Personal attributes contributing to health	78.95	49.03	0.59	0.17	3.46	0.0003

a. Definitions for all cultural elements are detailed in APPENDIX A: Cultural Elements Coding Protocol.

Inter-rater reliability results for the CASP qualitative checklist, showed that the Krippendorff's alpha level was below an acceptable rate, -0.09, for the sum of scores of the 19 manuscripts between the two coders. An additional analysis was done to determine what items differed in coding. Table 4.3 shows Cohen's Kappa coefficient for the individual items from the CASP qualitative checklist. The average percent agreement for all items was 87.29 but the average Kappa reliability coefficient was 0.54, indicating that on average only 54% of the coding is not due to chance. Only 12 of 36 items in the checklist had an acceptable Cohen's kappa coefficient of 0.70 or greater, however, all items had a percent agreement of at least 73.68.

Table 4.3 Inter-rater reliability results for each item from the Appraisals Skills Programme (CASP) Qualitative Che	ecklist
from 19 studies.	

Corresponding Variable Question ⁸	Percent	Expected	Kanna	Std.	7	Drob\7
Corresponding variable Question	Agreement	Agreement	карра	Err.	L	FTOD-L
3.1 Is there a clear statement of the aims of the research?	100.00	90.03	1.00	0.23	4.36	0.000
4.1 Is a qualitative method appropriate?	94.74	94.74	0.00		-	
5.1 Is it clear where the sample was selected from?	84.21	65.60	0.58	0.21	2.78	0.0027
5.2 Is it clear why this setting was chosen?	73.68	54.85	0.42	0.23	1.83	0.0336
5.3 Is it clear who was selected?	84.21	75.90	0.34	0.17	1.99	0.0233
5.4 Is the sample selection appropriate and justified?	78.95	72.85	0.22	0.21	1.06	0.1442
5.5 Is it clear how the sample was selected?	89.47	66.76	0.68	0.23	2.98	0.0014
5.6 Is the sample size justified?	89.47	73.41	0.60	0.23	2.63	0.0042
5.7 Is it clear how many people accepted or refused to take part	94.74	77.01	0.77	0.22	3.45	0.0003
in the research?						
5.8 Is it clear why some participants chose not to take part?	100.00	90.03	1.00	0.23	4.36	0.0000
5.9 Is adequate information given on the characteristics of the	78.95	56.23	0.52	0.22	2.33	0.0099
people in the sample						
6.1 Is it clear where the setting of the data collection was?	89.47	56.23	0.76	0.22	3.41	0.0003
6.2 Is it clear why that setting was chosen?	94.74	77.01	0.77	0.22	3.45	0.0003
6.3 Is it clear how the purpose of the research was explained and	100.00	73.41	1.00	0.23	4.36	0.0000
presented to the participants?						
6.4 Is it clear how the data were collected?	84.21	84.21	0.00	0.0000		
6.5 Is it clear how the data were recorded?	94.74	94.74	0.00		-	
6.6 Is it clear whether the methods were modified during the	78.95	52.91	0.55	0.22	2.47	0.0067
process, and if so, why?						
6.7 Is it clear who collected the data?	84.47	59.56	0.74	0.20	3.65	0.0001
7.1 Is it clear how the analysis was done?	89.47	61.22	0.73	0.23	3.18	0.0007
7.2 Is it clear how the categories/themes were derived from the	89.47	56.23	0.76	0.22	3.41	0.0003
data?						
7.3 Is there adequate description?	68.42	50.69	0.36	0.22	1.60	0.0543
7.4 Have attempts been made to feed results back to	94.74	58.73	0.87	0.22	3.83	0.0001
respondents?						

Table 4.3 (cont'd)

7.5 Have different sources of data about the same issue been compared where appropriate (triangulation)?	94.74	94.74	0.00	•		
7.6 Was the analysis repeated by more than one researcher to ensure reliability?	84.21	57.62	0.63	0.21	2.95	0.0016
8.1 Is it clear whether the researchers critically examined their own role, potential bias, and influence?	89.47	80.61	0.46	0.19	2.37	0.0088
8.2 Has the relationship between researchers and participants been adequately considered?	84.21	80.61	0.46	0.19	2.37	0.0088
9.1 Are sufficient data presented to support the descriptive findings?	73.68	68.70	0.16	0.20	0.80	0.2107
9.2 Are quotes numbered/identified?	100.00	61.22	1.00	0.23	4.36	0.0000
9.3 Do the researchers explain how the data presented in the article were selected from the original sample?	84.21	76.18	0.34	0.17	1.97	0.0246
9.4 Do the researchers indicate links between data presented and their own interpretations of what the data contain?	84.21	75.90	0.34	0.17	1.99	0.0233
9.5 Are negative, unusual, or contradictory cases presented?	84.21	49.31	0.69	0.22	3.16	0.0008
9.6 Is there adequate discussion of the evidence both for and against the researchers' interpretations?	78.95	62.33	0.44	0.20	2.22	0.0132
10.1 Is there conceptual and/or theoretical congruence between this and other work?	89.47	72.85	0.61	0.21	2.90	0.0019
10.2 Are the findings of this study transferable to a wider population?	84.21	75.90	0.35	0.17	1.99	0.0233
11.1 Is it possible to summarize the findings?	73.68	51.52	0.46	0.19	2.37	0.0088
11.2 Were the findings explicit and easy to understand?	100.00	53.46	1.00	0.23	4.36	0.0000

The cultural elements listed in Table 4.4 are those which were most frequently reported in the qualitative studies about diabetes among Mexican-Americans. These findings illustrate the topics relative to T2DM, including diet and PA, that were important to Mexican-Americans relative to their diabetes. Among the 38 elements, the most frequently found elements in the studies were general health beliefs, general beliefs and attitudes about food, food habits, food preferences, family turmoil, influence of family, and beliefs and attitudes about PA. Table 4.4 displays the frequency of appearance of the element and the level of evidence of the element. The level of evidence is in reference to whether the element was identified based on the author's description of their findings or based on quotes provided directly from the data that was used to report findings in the studies.

Only one cultural element appeared in all 19 studies, general health beliefs or attitudes and 13 provided a quote from the participants in the study. The second most common cultural element found in the studies was general beliefs and attitudes about foods in 17 of the 19 studies and of these, 11 provided quotes from the participants. Food habits, food preferences and family turmoil were found in 14 studies with nine providing quotes about food habits, eight providing participant quotes relative to family turmoil and seven providing quotes regarding food preferences.

The cultural elements that were found in the least number of studies (n=4) were PA preferences, trust and rapport, and healthcare provider support, and a quote for trust and rapport was only identified in one participant quote. PA preferences and healthcare provider support were each identified through a quote in two studies each. Additionally, the cultural elements machismo, lack of nutrition knowledge and religion as treatment were found in six of the 19

studies. Machismo was depicted in one study with a quote and the other two cultural elements were found in two studies, each with one participant quote.

As expected, deep level cultural elements were identified in the majority of the studies through the qualitative synthesis, except for one which had (172). On average, the manuscripts in this analysis had an average of 70% of the cultural elements coded as deep level items and 30% as surface level items. Only one reported an equal amount of both deep and surface level cultural elements, and this study had the least number of cultural elements among all the studies included for this analysis (90). The highest number of cultural elements was 23 in two studies (173, 174), and the lowest were six in two studies (90, 175).

i	Average Code for Elements	Frequency of element appearance	Frequency of quote present for the element
ID	n=19	n (%)	n (%)
Family			
Family turmoil	1.08	14 (73.7)	8 (42.1)
Influence of family	1.00	12 (63.2)	8 (42.1)
Influence of <i>familismo</i>	0.58	8 (42.1)	5 (26.3)
Emotion			
Belief or attitude about anger	0.84	11 (57.9)	6 (31.6)
Beliefs or attitude about shame	0.45	7 (36.8)	3 (15.8)
Food			
Beliefs or attitudes about foods in general	1.34	17 (89.5)	11 (57.9)
Food habits ^a	1.11	15 (78.9)	9 (47.4)
Food preferences ^a	1.00	14 (73.7)	7 (36.8)
Use or acquisition of nutrition knowledge ^a	0.92	11 (57.9)	8 (42.1)
Lack of Nutrition Knowledge ^a	0.34	6 (31.6)	2 (10.5)
Beliefs or attitudes about nopal/cactus	0.42	7 (36.8)	2 (10.5)
Beliefs or attitudes about tea	0.42	8 (42.1)	2 (10.5)
Belief or attitude about Mexican/cultural foods	0.68	9 (47.4)	6 (31.6)
Health Belief			
General health beliefs or attitudes	1.55	19 (100)	13 (68.4)
Beliefs or attitudes about depression	0.84	11 (57.9)	7 (36.8)
Belief or attitude about fatalism	0.89	11 (57.9)	8 (42.1)
Beliefs or attitudes about diabetes medicine or			
insulin	0.79	11 (57.9)	6 (31.6)
Combination of traditional and western medicine	0.50	8 (42.1)	3 (15.8)
Beliefs or attitudes about herbal or			
complementary and alternative medicines	0.53	8 (42.1)	3 (15.8)
Beliefs or attitudes about alternative treatments	0.42	7 (36.8)	2 (10.5)
Belief or attitude about susto	0.50	7 (36.8)	4 (21.1)
Belief that Mexican/Hispanic culture may cause			
diabetes	0.50	7 (36.8)	4 (21.1)

Table 4.4 Frequency and level of evidence of cultural elements from 19 studies.

Table 4.4 (cont'd)

Religion as treatment	0.34	6 (31.6)	2 (10.5)
Values		· ·	· ·
Belief or attitude about marianismo	0.58	9 (47.4)	3 (15.8)
Mistrust of healthcare professionals	0.45	8 (42.1)	3 (15.8)
Belief or attitude about machismo	0.32	6 (31.6)	1 (5.3)
Trust and rapport	0.18	4 (21.1)	1 (5.3)
Communication		· ·	
Health literacy ^a	0.82	10 (52.6)	7 (36.8)
Language considerations ^a	0.68	8 (42.1)	6 (31.6)
Physical Activity		· ·	· ·
Beliefs or attitudes related to physical activity	0.76	12 (63.2)	4 (21.1)
Physical activity habits ^a	0.58	9 (47.4)	4 (21.1)
Physical activity preferences	0.26	4 (21.1)	2 (10.5)
Healthcare System		· ·	· ·
Lack of healthcare provider support	0.79	11 (57.9)	6 (31.6)
Healthcare provider preferences ^a	0.76	11 (57.9)	5 (26.3)
Beliefs or attitudes towards diabetes education	0.58	8 (42.1)	5 (26.3)
Healthcare provider support	0.24	4 (21.1)	2 (10.5)
Other		· ·	i i i
Involvement by friends, excluding family			
members ^a	0.45	7 (36.8)	3 (15.8)
Cost related to diabetes ^a	0.45	7 (36.8)	3 (15.8)

^aindicates surface cultural level element; no designation indicates deep level cultural element

E. Discussion

Twenty-six of deep and ten of surface level cultural elements not typically reported in quantitative outcome studies were identified as important considerations for diabetes interventions targeting Mexican-Americans. The key deep-level patient perceived and reported cultural considerations for T2DM included family turmoil, influence of family, anger, depression, fatalism, beliefs about medicine or insulin, and lack of healthcare provider support. The key surface level cultural elements for T2DM were food habits, food preferences, use or acquisition of nutrition knowledge and healthcare provider preferences. In quantitative studies reporting outcomes of interventions relative to T2DM self-management among Mexican-Americans, cultural elements such as *familismo*, health beliefs related to medicine or insulin, and emotions such as anger or shame are rarely described as components of cultural adaptation. The qualitative studies examined for this analysis revealed the cultural elements related to health, especially diet and PA, play a role in the health-related behaviors of Mexican-Americans in their efforts towards achieving glycemic control.

Even less common are descriptions on how to culturally adapt an intervention to address issues such as shame, anger, health beliefs about insulin or fatalism in a way that encourages behavior change for achieving glycemic control. Many of the cultural elements identified and defined in this study go beyond the information on cultural adaptation provided in intervention outcomes. One example is family turmoil, described as having a negative effect on mental or physical health; a type of disturbance, confusion or uncertainty attributed to a family member(s) or caused by a family member(s) resulting in a negative outcome such as eating poorly, not being active, getting sick, etc. Family turmoil was identified in 14 studies, where eight were identified at a rating of 2, indicating that a quote was also specifically used to identify this cultural element.

Initially, cultural elements were identified and defined from the main findings of studies that met inclusion criteria. Once coding began, it was clear that some items were too broad and more specific items needed to be defined and included as separate coding items. For example, in the beginning of the coding, the category of "health beliefs" only appeared in five different manuscripts. However, when all articles were coded, six specific health beliefs that were each found in at least two different studies were identified and defined. These included beliefs about traditional and western medicine, beliefs or attitudes about depression, beliefs about religion as treatment, beliefs about alternative treatments that did not involve consuming a beverage or food, belief about fatalism, and the belief that having Mexican or Hispanic heritage was a cause of diabetes. Similarly, the food elements began with six items and by the final protocol, an additional four were identified, defined and added to the coding protocol. The iterative process in coding was a strength in identifying and defining cultural elements that may not otherwise have been as strongly emphasized in individual studies, but in aggregate, helps us understand culture-specific ideas shared among Mexican-Americans with T2DM.

One aspect of diabetes self-management care that was not as frequently mentioned in the cultural elements was PA. In a systematic review of PA challenges among culturally and linguistically diverse migrant populations, researchers found that some barriers to PA include cultural and religious beliefs, social isolation, and also lack of access and other socioeconomically related barriers (176). In the current study, the frequency of PA habits and preferences were identified 9 and 4 times, respectively. And although beliefs or attitudes related to PA appeared more often, 12/19, the studies reported these in broad terms. Unlike with the specific food-related elements such as beliefs about tea or *nopales*, no specific PA beliefs were identified in the studies reviewed. However, this is an area that should be further investigated

among Mexican-Americans with T2DM given that PA is as important component in selfmanagement of T2DM.

Cultural elements, such as PA preferences, the role of healthcare provider support and trust and rapport with the healthcare professionals were found less frequently in this analysis due to several explanations. First, the studies may not have been specifically designed to examine Mexican-Americans' culture-specific PA perceptions on T2DM self-management behaviors. Therefore, the participant's perceptions were focused on other aspects of care and there was no further probing on PA-related ideas. PA studies with Hispanics do show that there are certain types of activities that contribute to their T2DM self-management whether they are daily activities performed through the type of employment or leisure-time physical activities (12, 177).

Two particular cultural elements that were difficult to separate from one another were *machismo* and *marianismo*. *Machismo* is described in relation to the traditional gender role for example as it relates to male dominance, entitlement or irresponsibility or as a protective factor in providing and protecting the family (96). *Marianismo* is characterized as a woman not having a voice or agency and the assumption that she has to raise the children (93). In a home of a patient with T2DM, it is possible that these two cultural elements operate/function/activate behaviors in a similar way since with the definitions used in this study are also similar. It is difficult to examine *marianismo* in a T2DM cultural encounter unless the client or family member explains or provides information regarding their role in the household and linking it to their gender. Similarly, unless the client or family member discusses their role in the home as it relates to food, *machismo* is difficult to identify. Future studies pertaining to Mexican-Americans should combine these two cultural elements and examine gender roles to identify how these independently function within the culture and T2DM self-management behaviors.

From this study, it is evident that deep-level cultural elements are important for behavior change. Within the HBM, these deep-level cultural elements can enter the decision-making process at multiple points/transactions in the model. At the level of individual perceptions, beliefs about medicine, especially the belief that insulin leads to complications of T2DM (178), may prevent an individual from achieving glycemic control due to their lack of understanding of the role of insulin. The belief that insulin causes diabetes complications may interfere with management of the disease if an individual refuses treatment. This study reveals cultural elements that may influence diet and PA behaviors and further examines where they can fit in the HBM for behavior change. Under the level of modifying factors of the HBM, a health professional, especially RDNs, can make recommendations of culture-specific foods that do not elevate glucose levels, such as *nopales (87)*, which may then increase the likelihood of behaviors, not just diet related, but also related to medication adherence through counseling and education on the role of these for T2DM self-management (179).

However, consideration that the open-ended nature of qualitative research reflecting participants' voices and concerns, may confirm that such topics are not as important in relation to T2DM self-management for the target population. Finally, it is plausible that healthcare professionals and individuals providing T2DM self-management counseling in the studies examined addressed these cultural elements sufficiently such that participants did not feel concerned or a need to mention them during the interviews or focus group discussions. One such example is healthcare provider support. It is plausible that during the study, participants felt they had adequate support and were not compelled to discuss how the existing support helped them achieve their self-management goals, thus its appearance in only four studies. The concept of healthcare provider support is however important as shown in a previous study conducted by the

primary researcher where subjects emphasized the importance of the warm and caring manner of their healthcare providers which encouraged them to return to the same clinic for their healthcare and specifically, T2DM care (12).

In order to draw conclusions from the results, there are several limitations to consider. For example, in examining the studies that met initial inclusion criteria, a systematic rationale for exclusion was need t. For instance, the following three studies titled, "The Role and Meaning of Susto in Mexican-Americans' Explanatory Model of Type 2 Diabetes" (180), "Mexican Americans' Explanatory Model of Type 2 Diabetes" (173), and "Home Remedies for Type 2 Diabetes Used by Mexican Americans in El Paso" (90), were publications that resulted from the same research project. Each of these studies used these same data collected from the same participants to present the findings and reach conclusions. Similarly, the studies titled "Secondary analysis of perceptions and meanings of T2DM among Mexican American Women" (174) and "Pathways to Depression Care: Help-Seeking Experiences of Low-Income Latinos with Diabetes and Depression" (181) were studies published from the same research project. Another consideration was the used of mixed methods by one study to examine the desired outcomes (182). And lastly, one study did not reach data saturation. A meta-ethnography study that used the CASP checklist to determine the quality of the studies and found it useful in excluding studies for synthesis and drawing conclusions. However, due to the low inter-rater reliability of the CASP checklist applied to the articles in this study, all studies were included in for synthesis and drawing conclusions (183).

Another limitation of the current study, was in the definitions used to identify the cultural elements. Across different disciplines, world views, values, beliefs and even specific cultural elements attributed to Mexican-American culture are not consistently defined. For the purposes

of this study, general definitions were used and adapted to fit in a T2DM self-management cultural encounter. Additionally, it is plausible that other cultural elements were not identified as important to Mexican-Americans and T2DM since published studies limit word counts, and authors usually report the main findings of their research. Finally, although percent agreement for the CASP qualitative checklist used to assess the quality of the studies was acceptable, low inter-rater reliability using Cohen's kappa was low. It is possible that qualitative research methodologies vary by discipline and therefore it was difficult for two coders to apply the same assessment tool to the studies selected for this research. Additionally, despite training an undergraduate research assistant to apply the CASP qualitative checklist, it is possible that the low inter-rater reliability may be due to the different amounts of experience in qualitative research between the two coders, one whose only experience was coding for this study and the primary researcher who has coded, designed and conducted several qualitative research studies.

Furthermore, one challenge with the analysis of the qualitative studies analyzed in this study was that the professional foci of authors' works were in different disciplines. Some of these disciplines included social work, nursing, medicine, epidemiology, psychiatry, medical anthropology, health studies, and nutrition. In the review by Campbell et. al., they were able to identify that the authors had not referenced each other's work, and suggested that the most important criteria for including or excluding a study were that "a) the concepts and interpretations be grounded in the qualitative data gathered and b) that the concepts and interpretation posed were cogent and original," p. 682. Although qualitative research is not typically used for making generalizations, synthesizing qualitative research the results of this study demonstrate that it is feasible to aggregate and identify similar cultural elements across disciplines which may ultimately help healthcare professionals in providing culturally sensitive

counseling, inform culturally sensitive interventions research and ultimately improve patient outcomes.

F. Conclusions

This study provides an example of the culture-related perceptions and responses of Mexican-American T2DM patients primarily on diet and PA aspects of self-management. Cultural elements more likely reported as important for T2DM self-management by Mexican-Americans included eight in the category of food-related beliefs and ten in the category of general health beliefs. The cultural elements most frequently perceived important for T2DM selfmanagement by Mexican-Americans were family turmoil (14/19), family influence (12/19), beliefs relative to PA (12/19), and specifically, anger (11/19).

Anger, was an unexpected cultural element reported as influential in T2DM selfmanagement among Mexican-Americans. It is plausible that by addressing or providing recommendations or referrals to address anger, perhaps Mexican-Americans with T2DM may learn strategies to help manage emotions that have surfaced related to a T2DM diagnosis (184, 185) and be more open to achieving or attempting effective and sustainable diet and PA changes.

When providing MNT counseling to Mexican-Americans with T2DM, one strategy that is demonstrated as effective for weight-loss is the use of motivational counseling techniques (186). Through motivational counseling patients and RDNs may probe for cultural elements identified in this study to better influence T2DM self-management behaviors and potentially determine if there is a need for a referral to a specific medical professional, i.e. family therapist or psychologist, to overcome deeper level issues such as anger and shame associated with a diagnosis of T2DM.

CHAPTER 5 – Registered dietitians' perceptions of cultural elements for enhancing diet and physical activity among Mexican-Americans with type 2 diabetes

Target Journal: Journal of the Academy of Nutrition and Dietetics **A. Abstract**

Objective: The aim of this study is to characterize the perceptions of RDNs who provide T2DM counseling with Mexican-American adults on cultural elements related to diet and physical activity (PA) for self-management education. Registered dietitian nutritionists (RDNs) are medical nutrition therapy experts who provide counseling on lifestyle choices related to diet and are integral members of the diabetes healthcare team. Strong evidence exists for the positive impact on health and prevention of disease complications, especially T2DM, through healthy lifestyle choices and awareness of the relationship between culture and lifestyle has become an important part of medical education and training.

Methods: A cross-sectional, online questionnaire was designed for this study. A purposive sample was needed to recruit RDNs that met criteria: 1) currently a RDN for at least 12 months, 2) has provided diabetes counseling to Hispanic and/or Mexican-Americans patients in the past 12 months and 3) consent to participate in the study. Data was collected during three months from June 8, 2106 to September 8, 2016. Exploratory factor analysis (EFA) was used to identify what variables RDNs integrate into T2DM counseling. Second, a cluster analysis was used to identify associations between demographic and professional characteristics of RDNs.

Results: The six retained factors were emotions, health beliefs, beliefs about foods, beliefs about herbal, folk and traditional treatments, family elements, and religion. While most RDNs in the sample (82%) were exposed to some level of cultural awareness training, cluster analysis revealed that RDNs perceptions of cultural elements varied by years of experience,

where least experienced RDNs (average of 4.62 years) were more likely to perceive that beliefs about Mexican and American foods in general are important compared to the highly experienced group of RDNs (average of 33.98 years). Additionally, RDNs who practice T2DM selfmanagement counseling with Mexican-Americans were in the least experienced group, more likely to have a credential of certified diabetes educator, work in outpatient settings, and provide individual diabetes counseling.

Conclusions: In this study, we found that RDNs perceive cultural elements and training as important for diabetes counseling. However, their perceptions on food related cultural elements such as beliefs about Mexican foods, beliefs about American foods, food habits, and nutrition knowledge, differed by level of experience. Future research is needed on profession specific cultural competency and cultural sensitivity training relative to diabetes counseling.

B. Introduction

Mexican-Americans are disproportionately at risk for T2DM in the U.S. (23, 24) with prevalence rates almost double that of the current overall T2DM prevalence in the U.S. of 9.3% (25). Healthcare professionals play an important role in diabetes diagnosis and education; the Registered Dietitian Nutritionist (RDN) is the medical nutrition therapy expert (1). One key aspect of self-management behaviors is diet education provided by RDNs, but especially culturally appropriate dietary counseling is proposed to enhance behavior changes among ethnic minorities such as Mexican-Americans. However, it is unclear how cultural competence and sensitivity trainings lead to better health outcomes of patients, nor is it clear how healthcare professionals, including RDNs perceive and apply cultural knowledge into practice.

RDNs complete an accredited education program which provides education, training and skills related to dietetics and whose mastery is tested in five domains of the Registration Exam for Dietitians: 1) Food and nutrition, 2) Nutrition care process and model for simple and complex conditions, 3) Counseling, communication and research, 4) Food service systems, and 5)

Management (146). The education and training hence includes medical nutrition therapy and dietary counseling with patients who have diet-related diseases or conditions in both hospital and outpatient settings.

RDNs in general are considered the ideal healthcare professional for providing medical nutrition therapy to patients with diet-related diseases such as celiac disease, renal disease, food allergies and Type 2 Diabetes Mellitus (T2DM) (1). Further, there are dietitians who specialize in providing medical nutrition therapy specifically for T2DM. These dietitians have the option to record 2,000 hours of direct patient counseling and after meeting this and other requirements, they become eligible to take a certification exam in diabetes education (147). RDNs who wish to

become certified may take from two to five years to gain experience in diabetes mellitus management and complete the requirements.

With regards to providing culturally sensitive medical nutrition therapy, some RDNs may have more knowledge and experience working primarily with Mexican-American clients for example. This depends on several factors including geographic location, e.g. living and working in cities like Los Angeles, CA and Houston, TX, which have a large percentage of Mexican-Americans (148). Spanish language skills, desire to develop a specialization or skill in a specific area of practice such as diabetes or oncology, and many other reasons may also influence a RDN's expertise, whether or not these skills were gained with intentionality. It is important to assess the perceptions of healthcare professionals on cultural elements that they perceive to be important for patients in relation to T2DM self-management. This type of information may help healthcare practitioners and researchers understand how ethnicity and concepts about it play a role in the treatment of diseases (187).

Briefly, findings from the first study in this dissertation included the identification and characterization of 38 cultural elements according to Resnicow's Model for Cultural Sensitivity in Public Health which provides an explanation of how cultural elements are introduced into behavioral interventions to enhance health outcomes (17). In the model, surface level cultural elements involve matching the information or intervention to physical characteristics that the target population may prefer (17). Deep level cultural elements on the other hand, involve social, historical, environmental and psychological forces that influence a behavior in the target population (17). The key deep-level patient perceived cultural considerations identified for T2DM included family turmoil, influence of family, anger, depression, fatalism, beliefs about medicine or insulin, and lack of healthcare provider support. The key surface level cultural

elements for T2DM were food habits, food preferences, use or acquisition of nutrition knowledge and healthcare provider preferences. The findings from the first study provided insight into diet- and PA-related cultural elements that Mexican-Americans perceive as important in their T2DM self-management, which are further examined in the current study.

An examination of the approach used to develop a nutrition education evaluation tool titled Guide for Effective Nutrition Interventions and Education (GENIE) was completed by researchers from the Academy of Nutrition and Dietetics (150). This approach used face and content validity through expert panels to develop an internet-based, self-evaluation software for "nutrition education practitioners to design high quality and effective programs" (150). This study selected experts in the area of nutrition interventions and education and survey research experts to develop the items for the tool. The approach allowed researchers to develop methods, "to help nutrition education program planners design, self-assess, and improve programs," and "to help funders differentiate between programs of varying quality and drive funding decisions" (150). The GENIE study led to the development of recommendations for nutrition interventions and education as well as an evaluation tool.

One important consideration when we think about the diverse ethnicities served by healthcare professionals, including RDNs, is cultural competency and skills to facilitate and maintain healthy behaviors of clients (188, 189). However, it is not clear what specific qualities and skills in cultural competence and cultural sensitivity are desirable in RDNs and healthcare professionals providing T2DM self-management education to Mexican-Americans. Additionally, a tool that assesses cultural competency skills specifically of RDNs has not been published. Therefore, several tools were reviewed for the current study (151-157). One frequently cited tool used to assess cultural competency among healthcare professionals, specifically nurses, is the
Cultural Competence Survey by Schim and colleagues (151). This survey was modified by the researchers with the addition of questions relative to social desirability which can bias responses (157). Other strengths of the tool include the two subscales, one for cultural awareness and sensitivity and the other for cultural competence behaviors. Additionally, due to the number of items that were developed relative to cultural elements, it was important not to burden respondents with a survey containing a large number of items. Therefore, the objective of the current study was to characterize the perceptions of RDNs who specialize in T2DM counseling with Mexican-American adults on cultural elements related to diet and physical activity for self-management education.

C. Methods

A cross-sectional, online survey design was used for this study. Institutional review board approval was obtained with exempt status (APPENDIX F: Michigan State University Institutional Review Board Letter of Approval).

The target population for this aim was RDNs who provide T2DM counseling to Mexican-Americans. To find RDNs with this qualification, eligibility criteria for subjects were 1)currently a RDN for at least 12 months, 2) has provided diabetes counseling to Hispanic and/or Mexican-Americans patients in the past 12 months and 3) consent to participate in the study. These eligibility criteria were the first three questions on the online questionnaire and used to screen potential participants, see questions Q2-Q4 in APPENDIX D: Diabetes Counseling and Culture Questionnaire.

Purposive sampling was deemed the best approach to recruit RDNs who met study criteria. First, a sample size was difficult to estimate due to not knowing how many RDNs in the U.S. met criteria listed above. Second, to reach all RDNs in the U.S. was not realistic or financially feasible. The cost of obtaining e-mails for all RDNs ~80,000 was \$310 per 1,000 names, totaling \$24,800 through the Commission on Dietetics Registration. Therefore, purposive sampling was used to recruit RDNs who met criteria. Emails requesting distribution of online questionnaire were sent through sub-units of the main professional association for dietitians in the U.S., the Academy of Nutrition and Dietetics. Targeted groups included Latinos and Hispanics in Dietetics and Nutrition, Member Interest Group, the Diabetes Care and Education Practice Group, and the Weight Management Practice Group. To reach dietitians who were more likely to encounter Mexican-American clients, the state affiliated groups with the largest percentage of Mexican-Americans were also targeted. These included Texas, California, Illinois, Colorado, Georgia, New Mexico and Arizona. Additionally, a request was submitted through the Dietetics Practice based Research Network of the Academy of Nutrition and Dietetics. Data was collected during three months from June 8, 2016 to September 8, 2016. Potential participants who may have received the announcement for the study are shown in Table 5.1. The best estimate of how many individuals may have received the announcement for the study is approximately 13,566.

		Members reached
	Method questionnaire was	(Estimate
Name of subgroup targeted	distributed	membership)
Latinos and Hispanics in Dietetics	Listserv	94
and Nutrition Member Interest Group		(>300 members)
Diabetes Care and Education Practice	Email e-blast	~6,000
Group		(>6,000 members)
Weight Management Practice Group	General group, listserv	1,468
	Bariatric Specialty group,	1,129
	Listserv	(>5,000 members)
Texas Academy of Nutrition and	No response received after 3	NA
Dietetics	attempts	(>4,000 members)
California Academy of Nutrition and	Email e-blast	4,200
Dietetics		(6,500 members)
Illinois Academy of Nutrition and	Facebook private group	78
Dietetics		(3,800 members)
Colorado Academy of Nutrition and	Listserv	597
Dietetics		(1,400 members)
Georgia Academy of Nutrition and	Newsletter	NA
Dietetics		(>1,600 members)
New Mexico Academy of Nutrition	No response	NA
and Dietetics		(>300 members)
Arizona Academy of Nutrition and	No response	NA
Dietetics		(>1,000 members)

 Table 5.1 List of Academy of Nutrition and Dietetics subgroups contacted for

 dissemination of questionnaire with estimated number of members and members reached.

In consultation with Michigan State University Center for Statistical Training, it was recommended that at least 10 responses per cultural element item would yield in most meaningful interpretation of results (190). Therefore, with 25 items of interest, the goal sample size was 250.

Patient-centered cultural element items were written based on findings from study 1. Each cultural element identified in study 1 was tested for interrater reliability, which allowed us to exclude items that were not easily defined or infrequently cited as important for selfmanagement by Mexican-Americans with T2DM. Briefly, findings from study 1 included the identification and characterization of several cultural elements identified. Of the 36 cultural elements identified and characterized, 26 of deep and 10 of surface level cultural elements were selected as important considerations for diabetes interventions targeting Mexican-Americans. These were selected by examining which were found in at least 5 different research studies. Next, the elements were developed into survey items and after reviewing these, several were unclear and revised. After reviewing and revising, it was determined that some items were too similar (marianismo and machismo, beliefs or attitudes about foods in general and general health beliefs or attitudes); lost meaning when written as a questionnaire item (lack of healthcare provider support, mistrust of healthcare professionals, and beliefs or attitudes towards diabetes education); and some were concepts related to diabetes care that are taught as important for care therefore not patient centered and no variability in responses would be expected (cost related to diabetes, health literacy, and depression) (18). The patient-centered cultural element items hence included in this survey were 19 deep-level cultural elements and five surface-level cultural elements.

These survey items were designed as a 5-point Likert scale (161). Due to the novelty of the items, assessment among the convenient sample of RDNs, the 5-points were chosen over items with more points to determine which items were perceived most and least important for T2DM management and allow for a neutral response that would indicate the item is not well written (154). The use of the word always as a Likert option was discussed with item reviewers and it was decided that due to the nature of this study and novelty of items in relation to T2DM self-management, it should be included to discriminate cultural elements that are not frequently addressed in MNT counseling. Additionally, the option "not sure" was included for participants who perhaps had not encountered the cultural element in professional practice. A validated scale to measure perceptions of rapport was also identified and adapted for inclusion with the cultural

elements (191). Next, several studies and corresponding questionnaires on assessments distributed to healthcare professionals regarding cultural competence were reviewed (151-157, 192, 193). For the purpose of describing cultural competency and sensitivity skills in RDNs, the Cultural Competency Survey, a self-assessment tool, was selected for the current study because it includes subscales for cultural sensitivity, cultural competence behaviors and social desirability (151, 157). This tool consists of 49 questions that include demographic and workplace information (151). One of the limitations of this tool is that it does not address competency skills specific to RDNs such as perceptions and stereotypes regarding dietary behaviors of individuals of different ethnic groups.

To establish face and content validity, similar methodology to that used in developing GENIE was used (150). For this study, five experts in Mexican-American culture and diabetes and four researchers with expertise in community nutrition research were recruited to complete a review of the entire instrument. Additionally, two undergraduate students completed the questionnaire to establish clarity of question phrasing. From the feedback obtained, changes to the instrument included the addition of items regarding perceptions of American foods and behaviors in seeking information about new cultural foods, changes to wording of the cultural competency assessment tool, and organization of the items for ease of reading and flow. To ensure the items in the cultural assessment tool were not modified significantly from the validated intent, the changes to the questionnaire were sent via email to the author, Dr. Ardith Doorenbos, who stated, "I have reviewed all your changes and agree with all of them. These changes will not change the psychometrics of the scale." Therefore, the final instrument included 94 individual items, 72 were placed into 15 groupings, and one item was optional relative to the

solicitation of the questionnaire (APPENDIX D: Diabetes Counseling and Culture Questionnaire).

A cross-sectional email questionnaire was administered to organizations affiliated with RDNs meeting eligibility criteria for a period of three months from June to September 2016. The data was collected using Qualtrics online software (Qualtrics, Provo, UT 2016). This software was selected due to its friendly user interface, ability to eliminate ineligible participants and ease of importing the data format into multiple statistical analysis software.

From the 13,566 estimated to have received the email or listserv announcement about the study, a total of 354 initiated the survey. Nine respondents were not RDNs, 35 responded no to the question, "To the best of your knowledge, have you provided counseling to individuals of Mexican Heritage (e.g. Mexican-Americans, immigrants or individuals of Mexican heritage or descent) on T2DM self-management in the past 12 months?," and an additional 55 were excluded due to non-completion, if they took less than 5 minutes to complete the entire questionnaire, if qualitative responses revealed that the individual responding was retired, had not been an RDN for at least 1 year, reporting that they saw 0-1 Mexican-Americans on average for diabetes counseling per month, and those who did not provided an estimated number of Mexican-Americans on average seen for diabetes counseling per month. The final analyzable sample included for this study was 174 RDNs.

The current study uses two types of analyses both conducted with Stata/IC 14.1. Exploratory factor analysis was first used to examine the cultural element items written based on findings from study 1. Exploratory factor analysis (EFA) was determined to be most useful in identifying how the cultural elements relate to each other and eliminate variables that are not perceived important for medical nutrition therapy counseling with the target population. Each

item was measured in 5-point Likert-type scale. After examining descriptive statistics, 81 observations were excluded from the analysis due to responding "Not sure" to cultural element items leaving a sample size of 174 for EFA. Descriptive statistics of items revealed that no cultural element had more than 37% of RDNs respond "Neutral" to the item. Therefore, no cultural elements were excluded from EFA. Next, exploratory factor analysis with a varimax orthogonal rotation was completed to further clarify the patterns of cultural elements. This allowed the researchers to examine how different cultural elements load together based on RDN's perceptions of the deep and surface level. For the deep level cultural elements, six factors were retained with an Eigen value of 1.0 or higher. The six retained factors are Emotions, Health beliefs, Beliefs about foods, Beliefs about herbal, Folk and traditional treatments, Family elements, and Religion. For the surface level cultural elements, one factor was retained with an Eigen value of 1.0 or higher, and it is called Food-basics.

Second, a cluster analysis was used to examine the demographic and professional characteristics of RDNs. To reduce the number of variables for clustering, an exploratory factor analysis was completed with 51 variables. Variables that did not load to any latent variables and those with a correlation of less than 0.10 loaded to the seven latent variables were dropped from clustering analysis. Next, the same analysis was completed with the remaining 21 variables and those that loaded to the four latent variables had a correlation of 0.5 or less were excluded for clustering. Nine variables loaded to the four latent variables and these were used to for clustering of RDNs into three groups. These nine variables were years as a RDN, age, years of experience in diabetes counseling, participation in cultural competency training, participation in cultural competency training, number of Mexican-American patients seen monthly for diabetes counseling, work

setting in an outpatient clinic tied to a hospital and work setting in an outpatient clinic not tied to a hospital.

D. Results

The analyzable response rate was 49.1% (174/354), and descriptive results show that the majority of RDNs who participated in the study were non-Hispanic white, females, ranging in age from 24 to 70 years, and just over 50% had a master's level education (Table 5.2). Similarly, 95% of RDNs in the U.S. are female, with median age of 49, and 48% hold a master's degree (159). In this sample, more than one quarter of the respondents reported fluency in Spanish and 16% were of Hispanic/Latino heritage.

Characteristic	n (%)
Age Mean (SD)	44.40 (13.16)
Gender	
Female	171 (98.28)
Male	1 (0.57)
No answer	2 (1.15)
Ethnicity	
Non-Hispanic White	127 (72.99)
Mexican-American	14 (8.05)
African-American	6 (3.45)
Puerto Rican	4 (2.30)
Colombian	4 (2.30)
American Indian/Alaskan Native	2 (2.30)
Cuban	2 (1.15)
Salvadorian	2 (1.15)
Other, non-Hispanic ¹	13 (7.47)
No Answer	5 (2.87)
Hispanic ethnicity ²	28 (16.09)
Language fluency	
English	173 (99.43)
Spanish	48 (27.59)
Portuguese	1 (0.57)
Other ³	9 (5.17)
Highest level of education attained	
Bachelor's level	67 (38.51)
Master's level	99 (56.90)
Doctoral level	8 (4.60)

Table 5.2. Demographic characteristics of registered dietitian nutritionists in study who provide diabetes counseling to Mexican-Americans (n=174).

1)Individuals self-identified as Filipino (1), Asian (6), East Indian (1), Caribbean-American (2), Mixed (1), Chinese-American (1), Asian-Indian (1)

2) Hispanic ethnicity includes the categories of Mexican-American, Puerto Rican, Colombian, Cuban, and Salvadorean and from open ended responses who self-described as Panamanian, Latino or Hispanic.

3)Other languages respondents were fluent in: Bengali (1), Hindi (3), Tamil (1), German (1), Haitian Creole (1), Gujrati (1), Russian (1)

Table 5.3 displays professional characteristics of RDNs who provide diabetes education

to Mexican-Americans. An average of 40% of the patients seen for diabetes counseling were

Mexican-American. When asked about what sources of cultural-related knowledge they most

likely refer to when providing diabetes counseling to their patients, the highest rated item was

information they learned from Mexican-American patients (1.33) (1=strongly agree, 5=strongly

disagree). Social desirability scores were relatively high on average, 8.89 out of 13. Cultural

competency subscale scores were also high with an average score of 6.10 out of 7 for cultural

awareness and sensitivity and 5.70 out of 7 for cultural competence behaviors.

'	Table 5.3. Professional characteristics of registered dietitian nutritionists in study who
1	provide diabetes counseling to Mexican-Americans (n=174).

Professional Characteristics	Mean (SD)
Years of Experience as an RDN Mean (SD)	17.41 (12.89)
Years of experience providing diabetes counseling Mean (SD)	13.29 (11.44)
Self-reported number of patients monthly for diabetes counseling	51.22 (47.60)
Mean, (SD)	
Self-reported number of Mexican-American patients for diabetes	19.67 (30.17)
counseling Mean, (SD)	
Percentage of monthly patients for diabetes counseling that are	40.35 (37.41)
Mexican-American Mean, (SD)	
Sources for integrating info for diabetes counseling Mean (SD)	
(1=Strongly Agree, 5=strongly disagree)	
Formal education	2.26 (1.08)
Cultural competency training	1.91 (0.94)
Patients	1.33 (0.52)
Cultural Competency Assessment Score, Mean (SD) (1=low, 7=	
high)	
Cultural Awareness and Sensitivity Subscale	6.10 (0.48)
Cultural Competence Behaviors Subscale	5.70 (0.98)
Social Desirability Score, Mean (SD) (0-13, higher score	8.89 (2.32)
indicates more need for approval)	

Professional credentials, practice and training of RDNs who provide counseling to Mexican-Americans are depicted in Table 5.4. Half of the participants were certified diabetes educators and worked in an outpatient clinic tied to a hospital. Only 10% of participants reported working in a rural setting. The most commonly reported curricula used to provide diabetes education were the Diabetes Conversation Maps© and curricula provided by their employer. Additionally, 33% reported adapting their own curricula to provide diabetes counseling. With regards to cultural competency training, 18% reported having none, but of those who did complete cultural competency training, the most common were an employer provided programs (49%), continuing education opportunities (41%) and offerings at professional conferences (37%). Less than 40% of respondents worked with children and provided diabetes counseling to an average estimated number of 19 patients of Mexican-American descent per month. The majority also provided diabetes counseling through clinics associated with hospitals and delivered counseling to patients individually.

Category of credential, practice	Specific credential, practice or training	n-size (%)
or training		
Additional Certifications or	Certified Diabetes Educator	86 (50.57)
Credentials	Board Certified in Advanced Diabetes	3 (1.72)
	Management	
	Other certifications ^a	38 (21.84)
	No other Certification	24 (13.79)
	Health coach certification	10 (5.75)
Diabetes counseling to types of	Children	69 (39.66)
patients	Adults	158 (90.80)
	Older Adults	145 (83.33)
Due eties Cetting		44 (25.20)
Practice Setting	Hospital, Acute care	44 (25.29)
	Outpatient, associated with nospital	93 (53.45)
	Outpatient, independent clinic	39 (20.69)
	Private practice	32 (18.39)
	Rural	18 (10.34)
	Urban	35 (20.11)
	Suburban	20 (11.49)
	Other settings ⁶	27 (15.52)
Delivery method for Diabetes	Individual	167 (95.98)
Counseling	Group setting	99 (56.90)
	Online	15 (8.62)
	Phone	61 (35.06)
	Telehealth	11 (6.32)
	Other ^c	4 (2.30)

Table 5.4 Professional credentials, practice and training of registered dietitian nutritionists in study who provide diabetes counseling to Mexican-Americans (n=174).

Employer provided	75 (43.10)
Adapted existing	58 (33.33)
Created own	51 (31.03)
Diabetes conversation maps by Healthy Interactions Inc.	49 (28.16)
Vendor provided	26 (14.94)
Better Choices, Better Health - Stanford Self-Management Program by Stanford Medicine	22 (12.64)
Others ^d	14 (19.94)
No curriculum used	30 (17.24)
Yes	142 (80.61)
No	32 (18.39)
College course for credit	36 (20.69)
College course content	35 (20.11)
Professional conference	65 (37.36)
Employer provided program	86 49.43)
Online education	41 (23.56)
Continuing education	72 (41.38)
Other types ^e	5 (2.87)
	Employer provided Adapted existing Created own Diabetes conversation maps by Healthy Interactions Inc. Vendor provided Better Choices, Better Health - Stanford Self-Management Program by Stanford Medicine Others ^d No curriculum used Yes No College course for credit College course for credit College course content Professional conference Employer provided program Online education Continuing education Other types ^e

a. Other certifications reported: Certified Lactation Consultant or International Board Certified Lactation Consultant® (3), Certified LEAP Therapist (1), Certified Nutrition Support Clinician (2), Board Certified Specialist in Pediatric Nutrition (1), Board Certified Specialist in Renal Nutrition (1), Certified Board Certified Specialist in Sports Dietetics (1), Certified Nutrition Support Dietitian (1), Certified Personal Trainer or Personal Training Certification (3), Diabetes Prevention Program master trainer (1), Pharmacist (1), Adult weight management certification (2), Unknown credentials XRT (1) and CEDRD (1)

b. Other types of settings where diabetes counseling was provided by respondents: retail (3), AHDC (1), community health center (1), government (1), Home care (1), Insurance company (2), long term care (2), health department local or state (2), non-profit (2), Research, retirement community (1), skilled nursing facility (1), Psychiatric hospital (1), community college/university setting (3)

c. Other types of diabetes counseling delivery: text messages (1), written materials (1), patient portal (1), teleconference

d. Other Curricula used: American Association of Diabetes Educators (1), American Diabetes Association publications (2), Academy of Nutrition and Dietetics Nutrition Care Manual patient ed. Materials (1), Centers for Disease Control and Prevention Diabetes Prevention Program (3), Choose your foods (1), Learning about diabetes (1), International diabetes center (3), Michigan Diabetes (1), Sweet Success (1), Si Puedo Controlar Mi Diabetes (1)

e. Other types of cultural competency training: Life experiences (1), reading (1), teaching and research knowledge on topic (1), specialized program in California (1), mission service (1)

Three validated scales were used in the study, Table 5.5. Trust and rapport with

healthcare professionals was a common theme among Mexican-Americans as identified in the

first aim of this dissertation. The primary researcher modified the three items that comprised as

one independent scale to assess the perceptions regarding rapport of RDNs with their patients. However, reliability testing was low with a Cronbach's alpha of 0.46. The second scale was the cultural competency assessment scale which included two subscales. The reliability testing was low with a Cronbach's alpha of 0.42 for the Cultural Awareness and Sensitivity Subscale and 0.90 for the Cultural Competence Behavior Subscale (157).

Table 5.5. Reliability testing of the Trust and Rapport Scale, Cultural CompetencyAssessment Score, and Social Desirability Scale for registered dietitian nutritionists instudy (n=174).Scale NameNumber of Items
in ScaleAverage Inter-item
Cronbach's
Alpha

	in Scale	Covariance	Alpha Coefficient
Trust	3	0.16	0.46
Cultural Awareness and	11	0.07	0.42
Sensitivity Subscale Score			
Cultural Competence	14	0.86	0.90
Behavior Score			
Social Desirability Scale	13	0.03	0.70

To conduct the exploratory factor analysis, observations that were valued at 0 (participants selected "not sure" for each cultural element) were dropped. Table 5.6, displays six factors that were retained with an Eigen value of 1.0 or higher for EFA of deep level cultural elements. The six retained factors are emotions, health beliefs, beliefs about foods, beliefs about herbal, folk and traditional treatments, family elements, and religion and gender. For the surface level cultural elements, one factor was retained with an Eigen value of 1.0 or higher, and it is called food-related behaviors. Three cultural elements, Family turmoil, *Familismo* and physical activity beliefs did not load to any factor. This could be due to the low variability of these items, especially *Familismo* where all the respondents selected 1-strongly agree or 2-agree relative to the statement, "I believe it is important for me to always explain to my clients or patients how taking care of themselves will also benefit their family and their own diabetes."

	Factor	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5	6
Emotions						
Depression	0.74	0.17	0.15	0.14	0.12	0.14
Anger	0.82	0.18	0.08	0.22	0.18	0.15
Shame	0.74	0.18	0.04	0.28	0.17	0.21
Beliefs about susto	0.56	0.20	0.23	0.32	0.15	0.36
Health Beliefs						
Beliefs about medicine/insulin	0.13	0.57	0.28	0.24	0.15	0.19
Lack of support from Healthcare						
professionals	0.25	0.66	0.11	0.22	0.20	0.15
General beliefs about foods	0.24	0.58	0.37	0.11	0.14	0.05
Beliefs about types of foods						
Beliefs about Mexican Foods	0.07	0.13	0.89	0.09	0.06	0.06
Beliefs about American foods	0.14	0.17	0.87	0.13	0.07	0.05
Beliefs about Herbal and						
Traditional Treatments						
Beliefs about tea	0.27	0.24	0.15	0.70	0.22	0.15
Beliefs about nopal/cactus	0.35	0.12	0.18	0.60	0.21	0.11
Beliefs about alternative						
treatments	0.28	0.54	0.05	0.51	0.15	0.22
Beliefs about herbal/folk						
medicine	0.19	0.40	0.12	0.55	0.15	0.31
Family Elements						
Familismo	0.10	0.05	-0.01	0.18	0.63	0.08
Family involvement	0.20	0.22	0.13	0.11	0.68	0.09
Religion and Gender						
Beliefs about religion	0.37	0.31	0.10	0.27	0.13	0.60
Gender (Machismo/Marianismo)	0.44	0.11	-0.01	0.23	0.20	0.56
Non-loading Cultural Elements						
Fatalism	0.43	0.24	0.21	0.15	0.17	0.37
Physical Activity Beliefs	0.28	0.28	0.22	0.09	0.26	0.04
Family turmoil	0.39	0.26	0.18	0.11	0.40	0.19
Eigenvalue	3.35	2.16	2.08	2.01	1.50	1.31
Percent of variance/difference	1.18	0.09	0.08	0.50	0.19	0.79
Proportion	0.28	0.18	0.17	0.17	0.12	0.11
Cumulative	0.28	0.46	0.63	0.79	0.92	1.03

Table 5.6. Exploratory factor analysis results for deep-level cultural element items of diabetes counseling and culture questionnaire among registered dietitian nutritionists in study (n=174).

The EFA from the surface level items identified only 1 factor, Food Basics. These elements are related to fundamental topics used to assess nutrition knowledge and dietary

behaviors for nutrition counseling. The other two elements, healthcare provider preferences and

language preferences are components of counseling that impact nutrition-related behaviors and

counseling services received.

Table 5.7 Exploratory factor analysis results for surface level cultural element items of
diabetes counseling and culture questionnaire among registered dietitian nutritionists in
study (n=174).

	Factor 1
Food Basics	
Food preferences	0.72
Food Habits	0.60
Nutrition knowledge	0.72
Language preferences	0.08
Healthcare provider preferences	0.21
Eigenvalue	1.48
Percent of variance/difference	0.93
Proportion	0.091
Cumulative	0.91

Sensitivity analyses of exploratory factor analysis of deep- and surface-level cultural elements are depicted in APPENDIX J: Sensitivity Testing Results for Exploratory Factor and Cluster Analyses. In order to complete a sensitivity test of exploratory factor analysis of deep and surface level cultural elements, two separate analyses were completed. First, variables were dichotomized into disagree and strongly disagree, values 1 and 2, and neutral, agree and strongly agree, values 3, 4 and 5. Factor analysis with Varimax orthogonal rotation was completed for the dichotomized deep level cultural elements and then for the dichotomized surface level cultural elements and then for the dichotomized surface level cultural elements and then for the dichotomized surface level cultural elements for those displayed in table 5.6 and 5.7 with a few exceptions and are reported in Tables J1 and J2 in APPENDIX J: Sensitivity Testing Results for Exploratory Factor and Cluster Analyses. The first exception was the cultural element of shame under emotions which did not load with any factor. The next difference was related to the

cultural element beliefs about PA. In the EFA, this cultural element did not load with any factor, but in the sensitivity analysis, it loaded with Health Beliefs. And finally, the sensitivity analysis yielded 5 factors, although the sixth factor had an eigenvalue of 0.95, compared to the exploratory factor analysis of six factors that met the criteria of a greater than 1.0 eigenvalue. For the surface level cultural elements, one item that was excluded due to lack of variability in responses was food habits. All 174 participants selected agree or strongly agree as a response to whether this variable was important to explain how it affects their diabetes. The sensitivity analysis for the surface level cultural elements did not yield any factors with an eigenvalue of greater than 1.0. This may be due to the lower number of cultural elements, especially the omission of food habits.

A second sensitivity test was performed; a Cronbach's alpha for the items for the factor loadings in both the deep and surface-level cultural elements from the exploratory factor analysis. Table 5.8 provides a summary of the Cronbach's alpha results for the items that loaded together. For the deep level cultural element factors, the number of items in the scales ranged from two to four, with an average interim covariance of 0.26 to 0.64 and all had Cronbach's alpha coefficients of 0.72 or higher, indicating good internal consistency between the items in each factor. For the surface level factor, one scale with three items had an average interim covariance of 0.20 and a Cronbach's alpha of 0.77, indicating good internal consistency between the three items.

Table 5.8. Cronbach's alpha of	f factors from Exploi	ratory Factor Analysi	is of Deep and
Surface Level Cultural Elemen	nt Factor Solutions a	mong registered dieti	tian nutritionists in
study (n=174).			
	Number of	Average interim	Cronbach's

	items in Scale	covariance	alpha coefficient
Deep Level			
Emotions	4	0.64	0.90
Health Beliefs	3	0.31	0.79
Beliefs about Foods	2	0.47	0.93
Beliefs about Herbal and	4	0.61	0.86
Traditional Treatments			
Family Elements	2	0.26	0.72
Religion and Gender	2	0.64	0.79
Surface Level – Factor 1	3	0.20	0.77

Cluster analysis was completed through an iterative process. First, EFA on 57 variables was completed. Thereafter, only those variables that retained a predictive value of 0.50 were retained for final clustering. The final clustering was created using eight predictors. These are listed in order of highest to lowest predictive value: years as RDN (0.87), age (0.84), years of experience in diabetes counseling (0.80), Hispanic ethnicity (0.80), non-Hispanic white ethnicity (-0.65), Spanish language fluency (0.60), practice in an outpatient clinic (0.51) and private practice (0.51). The cluster quality was fair (between 0.0 and 0.5). K-means clustering using the previous eight variables was used to partition the data. This process was iterative starting with 15 clusters and decreasing the number of clusters. In reviewing the cluster results for each level of analysis, it was clear that the data was partitioned by level of experience, as suggested by the predictive variable from the EFA. Three clusters were used in the final analysis and are named according to years of experience since the average years of experience in each group differed by at least 10 years, Table 5.9. Clusters were thus named accordingly, cluster 1 Highly experienced, cluster 2 experienced and cluster 3 least experienced. The remainder of comparisons relative to

the research questions were made between the clusters and variables of interest such as cultural competency subscale scores, cultural elements, professional characteristics and demographics.

To examine the differences between the cluster groupings and variables of interest, ANOVA or Kruskall-Wallis H tests were performed. As expected, levels of experience were consistent with age and years of diabetes counseling experience. The cultural competency awareness and sensitivity (mean of 6.10/7) and the social desirability subscales (mean 8.89/11) were high for all three groups and no differences were observed between the three groups. The cultural competence behavior subscale scores were not as high (mean 5.70/7); the highest score was among the experienced group (5.88/7) and the lowest was among the Least experienced group (5.50/7) although not statistically different from each group (p=0.070). Other significant differences were that the experienced group was more likely to have participated in cultural competency training, although this was high for all groups, through a course for credit in college, a conference or seminar and through continuing education. The least experienced group was more likely to report having cultural competency content covered in a college course.

The majority of RDNs who self-reported they were of Hispanic ethnicity, 16 (57%), clustered into the least experienced group. The least experienced RDNs had 4.62 years as RDNs versus 33.98 and 19.55 years for the highly experienced and experienced groups, respectively. The least experienced group also provided diabetes counseling for largest number of patients (59.04 vs 49.64 for the highly experienced and 41.57 experienced groups), and the largest number of patients who were Mexican-American (25.85 vs 19.02 for the highly experienced group and 11.51 for the experienced group).

					ANOVA
					(Kruskall-
		Cluster 1			Wallis H
		Highly	Cluster 2	Cluster 3 Least	test)
	All	Experienced	Experienced	Experienced	P-value
	n=174	n=51	n=52	n=71	
Years of Experience as a RDN mean (SD)	17.69 (12.95)	33.98 (4.41)	19.56 (5.64)	4.61 (2.88)	(<0.000)
Age mean (SD)	44.67 (13.24)	59.80 (4.34)	47.84 (6.42)	31.46 (6.20)	(<0.000)
Years of experience in diabetes counseling	13.30 (11.35)	27.80 (7.69)	12.11 (5.70)	3.76 (2.47)	(<0.000)
mean (SD)					
Number of patients for diabetes counseling	49.38 (43.78)	48.76 (31.75)	40.87 (37.55)	56.06 (53.76)	0.163
mean (SD)					
Number of Mexican-American patients for	17.71 (21.27)	17.84 (20.06)	11.35 (13.59)	22.28 (25.39)	(0.049)
diabetes counseling monthly mean (SD)					
Hispanic Ethnicity n (%)	27 (15.43)	3 (5.88)	9 (17.31)	15 (21.13)	0.066
Certified Diabetes Educator n (%)	87 (50.00)	36 (70.59)	30 (57.69)	21 (29.58)	< 0.000
Participation in cultural competency training	0.82 (0.39)	0.78 (0.42)	0.90 (0.30)	0.78 (0.42)	(0.264)
Types of cultural competency training					
College course for credit	0.21 (0.41)	0.14 (0.35)	0.06 (0.24)	0.37 (0.49)	(<0.008)
Content covered in college course	0.20 (0.40)	0.08 (0.27)	0.13 (0.34)	0.32 (0.47)	(0.046)
Professional conference or seminar	0.37 (0.49)	0.37 (0.49)	0.510 (0.50)	0.28 (0.45)	0.047
Continuing education	0.40 (0.49)	0.37 (0.49)	0.48 (0.50)	0.37 (0.49)	0.390
Cultural Competency Scores					
Cultural Awareness and Sensitivity Subscale	6.10 (0.48)	6.09 (0.49)	6.11 (0.45)	6.10 (0.49)	0.994
mean (SD)					
Cultural Competence Behavior Subscale	5.70 (0.98)	5.81 (0.82)	5.88 (0.97)	5.50 (1.05)	0.070
mean (SD)					
Social Desirability Scale mean(SD)	8.89 (2.32)	8.96 (2.04)	9.35 (2.49)	8.51 (2.33)	0.130
Spanish Language Fluency n (%)	47 (27.0)	14 (27.45)	11 (22.00)	22 (30.14)	0.309

Table 5.9. ANOVA results comparing differences between clusters of registered dietitian nutritionists.

To examine differences between the groups and their perceptions on cultural elements, ANOVA was also performed with all cultural elements (Table 5.10). When the Bartlett's test for equal variance was significant, the Kruskall-Wallis H test was used to test for differences between the groups. Only four deep level elements and three surface level elements were statistically different between the groups. The four deep level elements were beliefs about insulin or medicine, beliefs about food, beliefs about Mexican foods and beliefs about American foods. The surface level elements were food habits, food preferences and nutrition knowledge. RDNs in the Highly experienced group scored the deep-level cultural elements beliefs about insulin or medicine (1.82) and beliefs about food scored (1.68) lower in importance compared to RDNs the experienced group who scored beliefs about insulin or medicine highest (1.49) and respondents in the least experienced group scored beliefs about food the highest (1.33). Additionally, the least experienced group perceived Mexican foods and American Foods as more important, 1.48 and 1.44 respectively, compared to the other two groups. Finally, the Least experienced group rated the surface level cultural elements food habits, food preferences and nutrition knowledge highest in importance, and the highly experienced group rated these the lowest in importance.

cultur ar cicilicitis. (II-174)					
Select Cultural Elements (With regards to "I					ANOVA
believe it is important for me to always explain		Cluster 1		Cluster 3	(Kruskall-
to my clients or patients how" 1=Strongly		Highly	Cluster 2	Least	Wallis H test)
Agree, 5=Strongly Disagree)	All	Experienced	Experienced	Experienced	P-value
Deep Level (Average score of items 2.03)					
Family Elements					
Familismo	1.35 (0.64)	1.42 (0.70)	1.21 (0.46)	1.14 (0.70)	0.180
Family turmoil	2.39 (1.03)	2.52 (1.07)	2.23 (1.03)	2.39 (1.01)	0.383
Family involvement	1.52 (0.72)	1.62 (0.70)	1.47 (0.67)	1.51 (0.77)	0.550
Diet and Physical Activity					
Beliefs about Foods	1.46 (0.64	1.68 (0.71)	1.43 (0.67)	1.33 (0.53)	0.010
Beliefs about Mexican Foods	1.60 (0.76)	1.88 (0.82)	1.51 (0.64)	1.48 (0.75)	0.009
Beliefs about American foods	1.56 (0.72)	1.82 (0.77)	1.49 (0.73)	1.44 (0.62)	0.010
Physical Activity Beliefs	1.66 (0.77)	1.74 (0.72)	1.59 (0.73)	1.64 (0.84)	0.609
Emotions		· · · ·	· · ·	· · · ·	
Depression	2.15 (0.93)	2.20 (0.88)	2.00 (0.94)	2.12 (0.95)	0.390
Anger	2.29 (0.99)	2.24 (0.87)	2.08 (1.00)	2.47 (1.04)	0.092
Shame	2.36 (0.96)	2.44 (0.88)	2.22 (0.97)	2.41 (1.01)	0.431
Health Beliefs					
Fatalismo	2.28 (0.97)	2.44 (0.81)	2.22 (1.05)	2.21 (1.01)	0.368
Beliefs about herbal/folk medicine	2.21 (0.97)	2.28 (0.78)	2.14 (0.98)	2.22 (1.08)	0.761
Beliefs about medicine/insulin	1.62 (0.70)	1.82 (0.72)	1.49 (0.64)	1.58 (0.71)	0.046
Beliefs about religion	2.55 (0.98)	2.58 (0.78)	2.37 (0.98)	2.66 (1.08)	0.271
Beliefs about susto	2.37 (0.96)	2.42 (0.88)	2.31 (0.93)	2.37 (1.05)	0.859
Beliefs about alternative treatments	2.05 (0.92)	2.16 (0.84)	2.02 (0.86)	1.99 (1.02)	0.577
Beliefs about tea	2.39 (1.01)	2.44 (0.95)	2.39 (0.96)	2.34 (1.10)	0.871
Beliefs about nopal/cactus	2.47 (1.07)	2.40 (0.93)	2.47 (1.05)	2.52 (1.18)	0.829
Values					
Gender (Machismo/Marianismo)	2.57 (1.00)	2.46 (0.89)	2.51 (1.08)	2.68 (1.03)	0.422
Lack of support from Healthcare professionals	1.78 (0.85)	1.94 (0.82)	1.62 (0.87)	1.77 (0.84)	0.179

Table 5.10. ANOVA results comparing differences between registered dietitian nutritionist clusters and their perceptions of cultural elements. (n=174)

Table 5.10 (cont'd)

Surface Level (Average score of items = 1.53)					
Food Habits	1.21 (0.41)	1.38 (0.49)	1.24 (0.43)	1.08 (0.28)	(<0.000)
Nutrition Knowledge	1.57 (0.78)	1.78 (0.86)	1.69 (0.81)	1.34 (0.63)	(0.001)
Food Preferences or avoidances	1.44 (0.59)	1.62 (0.67)	1.45 (0.46)	1.30 (0.46)	(0.012)
Healthcare provider preferences	2.25 (0.91)	2.28 (0.97)	2.20 (0.89)	2.26 (0.88)	0.887
Language preferences	1.25 (0.49)	1.30 (0.54)	1.25 (0.52)	1.23 (0.43)	0.757

With regard to the first research question, "What are RDNs' perceptions about the importance of culture-specific elements to nutrition, PA and other lifestyle factors of T2DM self-management for Mexican-Americans?," findings revealed that several deep and surface level cultural elements related to nutrition and PA were perceived positively as evidenced by the positive direction of the factors, Tables 5.5 and 5.6, and also from the lower scores indicating a positive perception of both deep and surface level cultural elements, Table 5.10.

For the second research question, "What culture-specific elements are most commonly reported as highly important by RDNs for providing T2DM self-management education to Mexican-Americans diagnosed with T2DM?," it was hypothesized that culture-specific elements most commonly reported as highly important by RDNs would include more deep level constructs compared to surface level constructs, since it is suggested that they are more likely to lead to behavior change (194). For this question, our hypothesis was not confirmed. It was clear that a higher proportion of surface level cultural elements were rated more positively as evidenced by an average score of 1.53 compared to deep level cultural elements with an average score of 2.03.

E. Discussion

As expected, the cultural elements that RDNs perceived important for diabetes counseling were mostly related to food and nutrition at both surface and deep levels. The items of interest originated from a study with Mexican-Americans with T2DM in aim 1 of this dissertation. However, it is clear that cultural competency on surface level cultural elements are perceived more positively with 4 of 5 (80%) of these elements receiving a score of less than two and 12/20 (60%) of deep level elements scoring less than two.

The six factors that were identified from results of the EFA showed that the items under the deep level categories of cultural elements are all perceived as important for T2DM self-

management. The items in the deep level categories were interesting in that they did load in expected patterns that are consistent with the literature. After the EFA, the categories were renamed into emotions, health beliefs, beliefs about foods, beliefs about herbal, folk and traditional treatments, family elements, and religion and gender to match the literature. With regards to surface level cultural elements, RDNs perceptions of cultural elements not related to nutrition did not load into any factor. This confirms that RDNs are focused on nutrition counseling versus other aspects of care. RDNs may need training on assessment for additional services their patients may need to build rapport and improve self-efficacy of their patients whose ultimate goal is to making healthful, sustainable behavior changes. Empowerment literature argues that by providing patients the resources they need to make multiple decisions about their own care, healthcare professionals may enhance behavior change long-term (103, 195). Therefore, it is important for RDNs to have culture-specific knowledge to make these referrals if needed during a counseling session.

One cultural element that was perceived to be important by all RDNs for T2DM selfmanagement and did not load to any of the factors is the Family Element of *Familismo*. It is a value found among Mexican-Americans and other Hispanic cultures, where there is a belief that the family is more important than the individual (92, 110). The idea that the family is the primary concern over one-self may be used to the advantage of the patient and provide empowerment for them to sustain behavior change to achieve positive diabetes outcomes. It is not clear why this cultural element did not load to either of the two latent variables, although it received the highest level of importance among the deep level factors, a score of 1.35.

In regards to the professional characteristics of RDNs, ethnicity variables were predictors of the clusters, and most of the RDNs who reported being of Hispanic/Latino heritage were in

the least experienced group. Additionally, the experienced group scored food elements in both surface and deep level categories as most important compared to the other two groups. The experienced group was more likely to score emotions and most of the health beliefs as more important for T2DM self-management than the other two groups, although these differences were not significant. Although there were no observed differences between the three groups in regards to settings for diabetes education delivery, curricula used, types of patients, or the cultural competency and social desirability scales, there were some differences in RDNs perceptions of cultural elements for T2DM counseling for Mexican-Americans.

Findings relative to cultural competency training indicate a need to examine what kind of training employers provide for RDNs who work with diverse ethnic populations since 80% of RDNs rely on these opportunities to enhance their skills in their place of employment. Studies conducted with nurses and physicians show that cultural competence is an area of need in regards to training (196). Cultural competency education may be addressed during undergraduate/college courses. However, the cultural competence behavior scale was rated lower than the cultural awareness and sensitivity scale, suggesting two things. First, RDNs are knowledgeable about cultural awareness and sensitivity. Secondly, despite this awareness, there is a gap in training on how to translate the awareness and sensitivity into behaviors. Therefore, it may be that RDNs are not applying the information learned relative to cultural competence into their diabetes counseling. Therefore, at all levels of dietetics education (students, interns and RDNs) opportunities should be provided for exposure to diverse audiences through experiential learning or simulations. Additionally, consideration by the Accreditation Council for Education in Nutrition and Dietetics for developing more specific knowledge and skills requirements for

undergraduate and graduate level education related to cultural competency and understanding cultural elements is warranted.

Findings from the cluster analysis also indicate that RDNs are likely to seek out cultural competency training through continuing education in addition to participating in cultural competency trainings at professional conferences. RDNs who reported integrating cultural competency from college courses was significantly higher among those who had the least experience allowing us to speculate that cultural competence information is being integrated into dietetics curriculum more frequently in recent years. There was a differing trend of cultural competency training of RDNs between the three clusters.

In the area of diabetes training, one credential that can be obtained through meticulous record keeping regarding patient counseling is the certified diabetes educator credential (147). This credential does not have any specific knowledge requirements with regards to cultural competence, other than the following statements in the examination handbook, Section 1 Assessment of Diabetes and Prediabetes, number 4, "Barriers to learning (concrete vs. abstract thinking, literacy and numeracy levels, language, cultural values, religious beliefs, health beliefs, psycho-social and economic issues, family dynamics, etc.) and Section 2 Interventions for diabetes and pre-diabetes, item 9 other management issues, letter (i) "Changes in usual schedules (shift, religious, cultural, etc.)" (147). Different types of healthcare professionals such as nurses, dietitians, physicians, pharmacists, etc., can take the exam to become a certified diabetes educator providing they complete all the requirements. Since 2009 the requirements to obtain this credential have become more difficult. Prior to 2009, a total of 1,000 hours of direct diabetes patient counseling from the prior 5 years (and at least 2 years of experience in professional practice) were required to sit for the exam. This requirement changed to having 40%

of the hours for the exam completed one year prior to sitting for the exam, and in 2014, volunteer hours towards this time was also acceptable to meet the requirements (147). As a result, the credentialing process is more likely to be of interest to professionals who work mostly in diabetes counseling in their professional setting. However, this credential lacks emphasis on cultural competence and is reflected in the current study as the highest experienced group had the largest percentage of certified diabetes educators. The least experienced group had the lowest percentage or certified diabetes educators, although they saw more patients for diabetes counseling, possibly due to RDNs working towards obtaining the required hours to take the examination, which was a comment on an open-ended question by one respondent.

RDNs often give dietary and self-management counseling, which may be directly impacted by different aspects of culture such as religion, food preferences relative to traditional food ways, and with immigrants, learning how to plan meals may be a new concept relative to relocation and time living in the U.S. (112). The findings in the current study did not delve into examining what kind of cultural competency training employers provided to the RDNs in order to provide culturally competent diabetes counseling to the patients that seek their services. Therefore, it is important that RDN credentialing agencies emphasize the need for cultural competency requirements at minimum during undergraduate and pre-professional supervised practice.

The number of Mexican-American patients or clients who were RDNs provided with diabetes counseling by RDNs was not a significant predictor for the clusters. However, there was an observed difference in the average number of Mexican-American patients counseled monthly per group. The least experienced group saw on average 25 and the experienced group saw 11 Mexican-Americans per month. Two RDNs in the least experienced group reported seeing an

average of 100 Mexican-American individuals for diabetes counseling per month. Removing these respondents and repeating analyses yielded similar results, where the least experienced group saw an average 16 Mexican-American patients and was no longer significantly different from the other two groups at p=0.07. Additionally, it may be possible that since the least experienced group had the highest percent of RDNs of Hispanic ethnicity, patients seek their services or are referred to them because their heritage factors into the complex process of healthcare seeking behaviors.

Another question that arises is, "Does heritage provide Hispanic RDNs an advantage in working with patients of the same cultural heritage?" In the qualitative text provided relative to cultural competency, several participants reported that personal experiences with patients of Mexican-American or Hispanic heritage provided insight into diabetes counseling. Additionally, many participants reported having "coworkers" of Hispanic heritage who are able to provide them information they can integrate into diabetes counseling. Future studies should investigate how information learned from personal experiences and coworkers transfer into diabetes counseling for patients as evidence suggests that this is an effective way to gain knowledge on working with Mexican-American patients (197). Some perceptions regarding differences between RDNs who are of Hispanic ethnicity and those who are not may also be examined. Findings may have respondent bias and should be interpreted with caution (or through the use of focus groups with RDNs) given that it may be possible to rank cultural elements that are familiar higher due to their familiarity from their upbringing higher rather than how these cultural elements influence T2DM self-management of patients. This was evident as only two out of the 81 respondents who answer "not sure" to the cultural element items in the survey were of Hispanic heritage. Additionally, it would be helpful to examine perceptions of others who work

with this population, such as para-professionals or *promotoras*, with regards to their perception of cultural elements in T2DM self-management to examine how these perceptions differ among providers with different kinds of training. Finally, it is possible that the levels measured in the cultural competency assessment in this study is not sensitive enough to differentiate between cultural competency skills gained from years of experience to those skills gained through ethnic identity.

A study by Renzaho and colleagues suggests that cultural competency as perceived by the provider increases their knowledge, self-reported practice and patient satisfaction, but it is not known how they translate into improved health outcomes of the patients (197, 198). Similarly, based on data from the current study, by using a cultural competency assessment that examined awareness and sensitivity and cultural competency-related behaviors, we can examine how to develop behaviors associated with the cultural elements. In the current study for example, anger depression and shame were cultural elements perceived by RDNs as important for diabetes care, and therefore we can infer that these cultural elements may be influencing dietary behaviors perhaps through behaviors such as emotional eating. By providing RDNs the training and knowledge on identifying the association between these behaviors, they can either provide the necessary dietary counseling or if necessary, refer patients to a mental health professional.

Strengths of the current study include that it is the first study attempting to measure perceptions of dietitians on deep level cultural elements and their importance to T2DM selfmanagement for a high diabetes risk population, Mexican-Americans. The findings provide a foundation for examining how RDNs can integrate deep-level cultural knowledge into diabetes counseling for better glycemic and health outcomes. Another strength is that the findings of the

study elucidate the need and justification for cultural competency building opportunities for this group of healthcare professionals. However, several imitations should be recognized.

There were several difficulties in the design prior the administration of the questionnaire. These included not knowing how many items would be integrated into the questionnaire until completion of the first study. The first study characterized and identified cultural elements relative to diet and PA for T2DM self-management which made designing the assessment instrument a challenge. The design of the assessment instrument impacted the estimation methods for determining the sample size in this study. The sample sizes were needed for examining associations between the professional characteristics of RDNs and also to examine if there were differences in their perceptions of cultural elements. Next, it was difficult to determine the population of RDNs who may provide diabetes counseling to Mexican-Americans resulting in self-reporting. Additionally, it was not possible to determine an accurate response rate because despite several attempts, it was unknown how many participants received and read the e-mail request to participate in the study. Usual response rates for web-based surveys with RDNs are between 17.5-59% (159, 199, 200). Data was collected from RDNs who self-selected into the study and the analyzable response rate was 49.1%. Eligibility criteria excluded nine individuals who were not RDNs, 35 individuals who did not provide diabetes counseling to Mexican-American patients and an additional 55 who did not complete the questionnaire because they felt it was a high response burden. Finally, 81 participants selected "Not sure" for one or more of the cultural elements and were excluded from analysis. Interestingly, only 2 of these respondents were of Hispanic heritage indicating that perhaps the cultural elements are more familiar to RDNs of Hispanic heritage. Those lost to study completeness is important because approximately 32% (81/255) of completed questionnaires were not included in the final analysis.

Although the questionnaire was assessed for content validity, pilot testing would have enhanced the reliability of the study findings. The relatively high scores for the social desirability scale also suggests that participants may have responded more positively to the cultural elements indicating that perhaps responses were biased towards being important for T2DM counseling for the target population. It is recommended that these scales be analyzed using confirmatory factor analysis to determine if the scale was appropriate for the study (201). Finally, survey design can be challenging and in this questionnaire, even a validated scale for rapport did not achieve acceptable levels of reliability reported in prior studies (191).

F. Conclusions

The present study represents an effort to examine how RDNs perceive and/or integrate culture into their practice with an ethnic group (Mexican-Americans) who are disproportionately impacted by T2DM. The results of the current study suggest that cultural competence, even within a focused area of practice is complex and not easily disentangled. In the current study, we found that RDNs are more likely to identify surface level compared to deep level cultural elements as important for diabetes counseling. However, the majority of the respondents (82%) reported having some level of cultural competency training, highlighting a need for profession-specific knowledge. It is important to study if enhanced profession-specific skills are needed to maximize efficacy of cultural competency into desired health behaviors.

Future recommendations include examining how emotions and other cultural elements translate into dietary and PA behaviors through research methods such as semi-structured, indepth interviews or focus groups with Mexican-Americans with T2DM. By providing specific examples and asking Mexican-Americans with T2DM to explain how these cultural elements manifest in their own behaviors, we can have a better sense of how to individualize

recommendations. This is especially important since healthcare professionals usually perceive these cultural elements to be barriers for behavior change. The traditional medical model/theory seldom explores cultural elements as facilitators for achieving positive health outcomes and should perhaps be modified to enhance healthcare professional efficacy (202).

CHAPTER 6 – Cultural elements in diabetes self-management intervention curricula for Mexican-Americans with diabetes

Target Journal: The Diabetes Educator **A. Abstract**

Objective: The objective of the current study is to evaluate the extent to which cultural elements related to diet and physical activity are incorporated in a sample of type 2 diabetes (T2DM) self-management intervention curricula that are used with Mexican-American adults. Many diabetes interventions have been culturally adapted to provide T2DM self-management education to this population, some of which have had success in improving health outcomes. However, it is not well known what aspects of these interventions have included specific cultural elements in the written curricula that are typically used by trained medical professionals.

Methods: Diabetes intervention curricula published since the year 2000 were requested from authors whose studies reported intervention outcomes. Eligibility included that the participants were majority of Mexican-American ethnicity and study objectives related to changes in behavior specific to diet and physical activity for T2DM self-management. Content analysis methodology was used to identify cultural elements in curricula.

Results: A total of six T2DM self-management curricula were analyzed. The main cultural elements related to diet were food habits, food preferences or avoidances, acquisition and use of nutrition knowledge, beliefs about Mexican/cultural foods and general health beliefs about foods. Physical activity-related cultural elements were limited to general aspects, versus culture-specific types, e.g. walking and dancing. Other T2DM self-management cultural elements which noted pertained to overcoming barriers, general health beliefs about diabetes, and family influences.

Conclusions: Several cultural elements were incorporated into the sample of T2DM selfmanagement intervention curricula that are used with Mexican-American adults. However, there was a lack of consistency between the curricula. Therefore, guidelines need to be established to assist those involved in such interventions with regard to the relevance of including cultural elements in a systematic, consistent manner for this and other ethnically diverse populations. This may translate into enhanced participant engagement and outcomes.

B. Introduction

To better meet health goals and specific needs of ethnic groups through health and nutrition interventions, many undergo cultural adaptation. This is especially true for T2DM mellitus (T2DM) self-management interventions targeting ethnic groups including Mexican-Americans. Cultural adaptations typically employ focus groups of members of the community being served, stakeholders and leaders to identify what and how to integrate these cultural adaptations (56, 101, 132-136). Despite the knowledge and need for cultural adaptation of interventions targeting ethnic groups, there are still no guidelines for what these cultural adaptations should be, how they should be addressed and how they impact outcomes.

The terms culturally tailored, culturally targeted and culturally adapted are often used interchangeably in describing approaches to making health programs, such as those for T2DM self-management, more appropriate for specific ethnic groups. Due to increasing knowledge and evidence of enhanced outcomes when accounting for culture in health interventions (116, 129, 130), researchers have begun to define interventions more clearly and categorize them into different approaches. In the area of psychology, Barrera and colleagues identified four approaches to the development of preventive interventions involving ethnic subgroups (131).

The following are descriptions of these approaches as defined by Barrera and colleagues (2011) using a critical analysis approach, p. 440, Table 1. The first approach is a prevention research cycle intervention that aims to "establish a theoretical and empirical foundation for intervention content and efficacy." This approach does not initially include consideration of culture, but rather is designed to address the health topic, and it is not until the implementation stage where culture is considered. A second approach is the cultural adaptation of evidenced-based interventions. In this approach, the emphasis is on modifying interventions to improve

cultural fit through the input of stakeholders, but maintaining the core components of the intervention. The next approach is the investigator initiated culturally grounded intervention. This approach depends on the inclusion of members of the cultural group of interest to participate in the creation of the intervention materials. And lastly, the community initiated, indigenous intervention reflects the values, priorities and perceptions of needs by a member/agent of the community in question.

Although the different approaches demonstrate efficacy, there is no preferred approach. The approach that is most commonly used in T2DM self-management education and medical nutrition therapy is the third approach described; cultural adaptation of evidenced-based interventions and this approach frames the cultural elements examined in the current study.

To have a better understanding of the approaches that lead to enhanced behavior changes resulting from health interventions, Resnicow and colleagues developed a cultural sensitivity model for adapting evidenced-based interventions for ethnically diverse cultures. This model, Resnicow's Model for Cultural Sensitivity in Public Health, provides a more comprehensive approach to understanding how cultural elements are introduced into behavioral interventions intended to enhance health outcomes (17). This approach distinguishes elements of culture in surface and deep level constructs. In the context of T2DM self-management interventions, surface level elements can include the use of community educators or paraprofessionals who are bilingual and bicultural often referred to as "*promotoras*" (117, 118) and provide the intervention in a specific type of setting (110), the preference for type of intervention such as one-on-one (118), use of cultural food models and/or language (88, 116, 119, 166), visuals such as picture-based food guides or models (102, 116, 135), recipes (167), bilingual professional staff (88) and peer-delivery also commonly referred to as delivery by trained community educators and
paraprofessionals (85, 103, 168, 169). Deep level adaptations include topics such as addressing family preferences for participation (88, 102), addressing health beliefs (85, 88), inclusion of cultural beliefs such as *familismo*, (the belief that the family is more important than the individual) (92, 110), *susto* (an event that caused intense fright or trauma) (170) and other information on beliefs about particular foods, such as *nopales*, commonly known as prickly pear, is believed to lower blood glucose levels) (121). The current study seeks to identify the use of several cultural elements that Mexican-Americans with T2DM believe influence self-management efficacy in curricula used for "evidenced-based interventions" for T2DM. Therefore, Resnicow's Model for Cultural Sensitivity in Public Health allows researchers to frame aspects of culture within the context of evidence-based, T2DM self-management intervention curricula.

Some T2DM self-management intervention curricula have taken some culture-specific beliefs into account, but it is unclear which of these influence T2DM self-management behaviors and outcomes. Therefore, the first research question was, "What are the most common diet and physical activity related surface level and deep level cultural elements integrated into T2DM self-management intervention curricula for Mexican-Americans?" Research interventions report effective lifestyle changes through cultural adaption of interventions targeting Mexican-Americans (88, 102, 135, 166). Based on review of culturally adapted interventions, it was hypothesized that self-management interventions incorporate more surface level versus deep level cultural elements, mainly because it is unclear which cultural elements lead to long-term behavior change in self-management interventions. The second research question was, "How are T2DM self-management intervention outcomes associated with diet and physical activity related cultural elements in T2DM self-management intervention curricula for Mexican-Americans?"

This is explored through a descriptive summary of cultural elements of curricula and corresponding intervention outcomes.

C. Methods

Content analysis methodology used in mass media communications was conducted to explore characteristics of T2DM self-management intervention curricula targeting Mexican-Americans because it provides a robust, reproducible approach to identify and define cultural elements identified from prior research (137). Cultural characteristics of interest included two broad categories of cultural elements, surface and deep levels, as defined previously.

The sample of T2DM self-management intervention curricula was obtained via several methods. First, a list of self-management interventions was generated using a key word search of T2DM self-management interventions targeting Mexican-American adults published in peer review journals and in ProQuest theses and dissertations published since the year 2000. Additionally, citations of these research studies were reviewed for additional studies that fit the self-management intervention curricula criteria. A comprehensive list was generated; authors or principal investigators, and/or centers where self-management interventions were/are occurring were contacted via email, with a follow-up by email or phone (if available) one week after the first contact. Up to four attempts were made to obtain curricula and any leads were followed up each week, by email and/or phone.

In the current study, the focus was T2DM, the more common type of diabetes among all Americans and disproportionately high among Mexican-Americans, and because it is a dietrelated disease, often preceded by overweight/obesity (18). The following characteristics were used as inclusion criteria of intervention curricula. A T2DM self-management intervention curriculum targeting Mexican-Americans that included the following characteristics:

- Objectives related to changes in behavior specific to diet and physical activity for T2DM self-management
- A statement that the intervention is for Mexican-Americans
 - When no explicit statement related to the target population is available, the intervention was included if the subject ethnic demographics indicated majority (>50%) of participants in the intervention were of Mexican-American ethnicity
 - If neither of these criteria are reported, attempts to reach the author(s) were made to obtain information on the ethnic makeup of the study participants
- Studies published since the year 2000 were included

The most commonly used marker of T2DM management is glycosylated hemoglobin (A1C). It indicates average glucose levels of the prior three months (47). This marker is commonly utilized by physicians to diagnose, monitor, and make medication adjustments in patients with type 1 and T2DM (18). Thus, a main variable of interest was change in A1C level.

When available, other variables used to assess the outcomes of the self-management intervention literature were noted, such as change in body mass index (BMI), changes in dietary behavior and diet composition, and changes in participation in physical activity. Diet recommendations typically included limiting intake of calories, fat, sugar and/or carbohydrates or intake of foods high in solid fats, alcohol, and added sugar and looking for increases in intake of fruits and vegetables. These dietary behaviors are of interest due to their association with glycemic control (165). Similarly, changes in physical activity are associated with improved glycemic control. Therefore, findings showing changes in physical activity behaviors included participation in physical activity, types of activities, changes in frequency of participation in PA during a specified period such as the duration of the intervention (165).

Independent variables of interest included the two broad categories, surface and deep level cultural elements. These variables were assessed by frequency of appearance in curricula. The surface level cultural elements were selected based on the literature. Surface level cultural elements were included using broad definitions and any new or more specific elements that were identified were defined and added during coder meetings. Some examples of these surface level cultural elements are below. New elements that were identified and defined were added during coder meetings as described in the coding protocol, APPENDIX I: Content Analysis Coding Protocol, where background information for the coders, detailed definitions of cultural elements and curricula characteristics in addition to coding specification are detailed. These are some examples of surface-level cultural elements, and more in-depth definitions are found in

APPENDIX I: Content Analysis Coding Protocol.

- Language(s): The languages the curricula are available in to provide the intervention, English, Spanish, or both.
- Familiar foods: The curricula provide explicit examples of foods that are common among Mexican-Americans as reported in the literature (i.e. *nopales, tortillas*, etc.).
- Visuals: Visuals recommended or provided in the curriculum that are not foods. These may include *foto-novelas* (picture/cartoon style story books), photographs of what would appear to be Mexican-American people, people participating in folklore dancing, etc.
- Peer-delivery: The curriculum indicates that the curriculum should be delivered by a peer of the participants, implying that these individuals are of the same ethnicity as the participants. These peer participants are not trained professionals, but are supervised or guided by trained professionals such as physicians, nurses or RDNs.
- Bilingual Professionals: The curriculum indicates that the program should be delivered by a bilingual professional with formal training. These trained professionals include but are not limited to physicians, nurses or RDNs.

Deep level cultural elements included for this level were items from the seven categories

previously identified in an earlier study by the primary researcher in study 1 in this dissertation.

These are some examples of deep-level cultural elements and more in-depth definitions are

found in APPENDIX I: Content Analysis Coding Protocol.

- Family: The curriculum should explicitly state that there was participation of family in the program, for example suggesting that a family member attend the self-management intervention with the participant or requests for at-home participation through dialogue with the participant.
- Health beliefs: The curriculum should explicitly include dialogue regarding health beliefs with participants.
 - Alternatively, dialogue regarding specific health beliefs such as *susto/fright*, *curandero/traditional healer*, *etc*. should be included.

Other independent variables regarding the characteristics of the curriculum included were the total number of lessons/sessions per intervention and recommended time for completion. Additionally, other self-management topics typically addressed in T2DM self-management education were also assessed such as eye care, foot care, medication adherence, self-monitoring with blood glucose meter, problem solving (treatments for acute hypo and hyperglycemia events), recommendations regarding participation in physical activity and recommendations regarding diet.

Through the methods described above, initially 11 eligible intervention studies for T2DM were identified. Requests to authors of the eleven studies were sent and six of the authors provided the documents for review (14, 16, 88, 100, 129, 130). One publication had a curriculum, but the outcomes of the intervention using the curriculum were not published, and therefore not included in this analysis (203). One author did not have a written curriculum written for the intervention published and this intervention focused solely on physical activity (204). The curricula for two additional studies were not obtained despite several attempts (116, 205, 206). Finally, one author asked the researcher to locate the published description of the curriculum instead of the curriculum itself and was, thus not included (107). Of the 11 curricula, six were included in this analysis and one had separate English and Spanish versions.

Coding was conducted independently by two senior-level, undergraduate trained research assistants with intermediate level Spanish skills, who were trained by the primary, bilingual researcher. Spanish reading skills were assessed prior to coding commencement the by the primary researcher. The coder training by the primary researcher also included reading assignments related to background information on several concepts related to Mexican-American culture. These concepts include the surface and deep level constructs from Resnicow (17) used

as the framework for the current study. Next, training included concepts on nutrition and physical activity related recommendations for T2DM self-management based on the American Diabetes Association's Standards of Care (6) and finally, concepts related to cultural elements that may impact T2DM self-management for Mexican-Americans as reported in the literature. It was necessary to have prior knowledge of these concepts to better identify how Mexican-Americans with T2DM perceive them. This was accomplished by assigning the coders to reading assignments described above, and weekly meetings for two months with the primary researcher to clarify questions and discuss the concepts. During these meetings, the coding protocol was reviewed and changes to definitions and the content analysis codebook, APPENDIX J: Content Analysis Codebook, were made. At the first meeting, coders were provided with one curriculum, which was not one of the six curricula for final analysis. Items that remained unclear in the codebook were clarified. At each subsequent meeting, discrepancies between coders were discussed and clarified similar to the constant comparison method used for qualitative research to reach consensus (207). Additionally, in developing a scoring method for the cultural elements, it was important to facilitate distinction between information being given or told to the target audience, and an action/behavior that the target audience could perform relative to the information given. Therefore, if a code was identified, a level 1 was given to information that did not have a corresponding action and a level 2 was given to information if a recommended action or behavior was provided.

In this study, content analysis provides the frequency and level of appearance of the deep and surface level cultural elements in T2DM self-management curricula. Additionally, intervention studies detailing the outcomes related to the corresponding curricula are examined, described and compared.

D. Results

Descriptive statistics for the overall sample of curricula obtained includes the number of lessons per intervention, types of objectives related to diet and physical activity, target population defined for intervention, language or curriculum, other self-management topics such as eye care, foot care, medication adherence, self-monitoring with blood glucose meter and problem solving for hyper- and hypoglycemia. These are provided in Table 6.1.

Characteristics of Interest	Frequency of Appearance in Curricula
Number of lessons per intervention, Mean	9.29 (5-26)
(Range)	
Objectives related to diet	1/6 - No related objectives
	1/6 – Objective for entire curriculum
	5/6 – Objectives in each lesson/module
Objectives related to physical activity	1/6 – No related objectives
	1/6 – Objective for entire curriculum
	5/6 – Objectives in each lesson/module
Target population defined for intervention	6/6 – No specification for target population
	of curriculum intervention
	1/6 – Mexican Americans
Language curriculum is written	3/6 – English Only
	3/6 – Both English and Spanish
Eye care	4/6 – Yes
	2/6 – No
Foot care	5/6 – Yes
	1/6 – No
Medication adherence	5/6 – Yes
	1/6 – No
Self-monitoring with blood glucose meter	5/6 – Yes
	1/6 – No
Problem-solving for hyper- and/or	4/6 – Yes
hypoglycemia	2/6 – No

 Table 6.1. Diabetes self-management curricula characteristics. (n=6)

The curricula included in the current study were selected strategically to examine how content in the curricula relates to the outcomes of the intervention it describes or facilitates. In the six curricula, there were eight surface level cultural elements and 35 deep level cultural elements, thus all curricula had more deep level cultural elements that were identified through

content analysis. The cultural elements originated from the first study in this dissertation that identified diet and physical activity cultural elements perceived to be important by Mexican-Americans. Inter-rater reliability between the two coders for most elements using Cohen's Kappa was high, 0.72 - 1.00. One variable, beliefs about Mexican cultural heritage and T2DM, was discarded due to an inter-rater reliability of 0.63, less than the 0.70 recommended level (137).

When comparing the type of cultural elements, surface level cultural elements had a 63% appearance rate versus 52% of the deep level cultural elements. The top ten most frequent cultural elements were food habits, overcoming barriers, general health beliefs about diabetes, influence of individuals who are not family members, non-specific support, beliefs about Mexican/cultural foods, family influence, acquisition and use of nutrition knowledge, general health beliefs about foods, and food preferences or avoidances.

There were 38 cultural elements that Mexican-Americans with T2DM perceived as influencing their T2DM self-management especially in regards to diet and PA behaviors. These were characterized and defined in the first study of this dissertation, and included in the current study. We found that some of the deep level cultural elements were rarely addressed in the curricula included. These were relative to emotional health topics such as depression and anger; values such as *marianismo* and *machismo (Machismo* described in relation to the traditional gender role and male dominance, entitlement or irresponsibility (96) and *marianismo* is characterized as a woman not having a voice or agency and the assumption that she has to raise the children (93)); and specific health beliefs such as *susto* (an event that causes diabetes because of an intense fright or trauma (170)). Table 6.2 provides a summary of all the cultural elements examined in the content analysis of curricula.

	-	Average	Frequency	
	Frequency of	Score for	at Highest	
	Cultural	Level of	Level of	
Cultural Elemente		Evidence	Evidence	Comple suctor talen from cominule
Cultural Elements	n (%)	(0-2)	n (%)	Sample quotes taken from curricula
Equily Equily				
Family Influence	6 (95 71)	1.50	2	"How Can Others Especially Especial Manham Support Var?" (a)
Family Influence	$\frac{6(83.71)}{5(71.42)}$	1.30	3	"A newlaw pattern will been you from acting to human and looks
Familismo	5 (71.45)	1.20	1	control. This way of eating is healthy for everyone in the family." (a)
Family turmoil	4 (57.14)	1.25	1	"Younger participants may be dealing with family violence issues. Older persons may have to deal with abusive children and caretakers. In areas with high crime, they may fear exercising or for the lives of their children and grandchildren. Elderly men are known to be prone to alcohol abuse." (b)
Diet and Physical Activity				
Food Habits	7 (100.00)	2.00	7	"Write down what foods you would eat in one day for each of the food groups." (Chart provided) (c)
Beliefs about Mexican cultural foods	6 (85.71)	1.33	2	"Traditional foods can be high in fat and salt. Example: Carnitas, Tamales, Deep fried tacos" (c)
Health Belief, Foods general	7 (100.00)	1.57	4	"Ask participants to name some of the foods or drinks they use to treat hypoglycemia, and to discuss how well they work." (d)
Physical activity beliefs	7 (100.00)	1.71	4	"Ask participants which exercises were the easiest and which were hardest." (b)
Health Beliefs				
Health Belief, Diabetes general	6 (85.71)	1.83	5	"Encourage participants to define diabetes in their own words." (e)
Health belief or attitude, general	4 (57.14)	1.25	1	"Social support helps us make healthy lifestyle changes!" (c)
Susto	1 (14.29)	1.00	0	"Beliefs - some Mexican Americans believe that diabetes is caused by eating too much sugar, or by susto or depression and sadness. Some think it cannot be prevented" (a)
Herbal/folk remedies	4 (57.14)	1.25	1	"Remedios: What kind of herbs (if any) do Mexican American people use to prevent diabetes" (a)
Beliefs about tea	0	0	0	
Religious influence of food avoidance	0	0	0	
Religious influence for food preferences	0	0	0	

Table 6.2 Summary of cultural elements from content analysis in six diabetes self-management curricula.

Table 6.2 (cont'd)				
Traditional and western medicine use	2 (28.57)	1.00	0	"Remind participants that there is no scientific evidence that herbal remedies are effective in diabetes control. Suggest that they let their provider know of any herbals or supplements they are taking; some may interfere with their diabetes management." (d)
Alternative treatments	1 (14.29)	2.00	1	"Encourage participants to share their alternative remedies and nonprescription drugs. However, never directly question their effectiveness. Encourage them to monitor their effectiveness through blood glucose self-monitoring and quarterly HbAlc results." (e)
Beliefs about medicine or insulin	5 (71.43)	2.00	5	"ASK: If you take pills, what thoughts did you have when your provider recommended that you take pills to manage your diabetes? How have your thoughts changed? (write responses on board)" (d)
Beliefs about heritage and cause of T2DM	5 (71.43)	1.40	2	"GROUP DISCUSSION: Why do you think you developed diabetes? Write responses on the board. If the following are not offered, include them on the list. Type 2 diabetes runs in families (genetic). Genetics may also be related to why certain racial/ethnic groups have higher rates of diabetes (Latinos, American-Indian, African Americans, some Asian and Pacific Islander groups)." (d)
Emotions				
Shame	0	0	0	
Anger	4 (57.14)	1.50	2	 "ASK THE GROUP: What are some of the ways you feel, or have felt, about having diabetes or having to care for your diabetes? write these feelings on the board and discuss Note to peer: If participants don't give examples, mention one or two symptoms of diabetes stress: Feel angry, scared, or depressed when thinking about living with diabetes" (d)
Depression	6 (85.71)	1.50	3	"If the patient speaks of symptoms of depression or anxiety, ask them to make an appointment with their primary care physician or a physician we assigned them to for further help." (b)
Stress	6 (85.71)	2.00	6	 "ASK: "What are the signs you notice when you are stressed? What do other people notice when you are stressed?record responses on flipchart; if participants don't offer any of the following, you can: Irritable, anxious, short-tempered, tearful, overeating, can't fall asleep, physical symptoms such as headache, stomach ache" (d)
Feelings, general	6 (85.71)	1.83	5	"Use your creativity to show the participants how they can lower their stress levels: Journaling their feelings" (d)

Table 6.2 (cont'd)				
Sadness	2 (28.57)	1.00	0	"It is common for people to have different feelings and to go through these different stages. But, if you are sad most of the time, or your feelings get in the way of your diabetes care, remember that help is available." (b)
Values				
Machismo	0	0	0	
Marianismo	1 (14.29)	1.00	0	"Carmen was an active womanAs an adult, she stopped playing team sports, but she developed new interests in running, tennis, salsa dancing, and aerobics classes." (c)
Healthcare support	4 (57.14)	2.00	4	"Discourage health promoters from teaching insulin administration. (This is a role for CDE's or other health professionals.) Their role is to support adherence and health promoters should refer persons having trouble to the appropriate professionals." (e)
Lack healthcare support	1 (14.29)	1.00	0	"Sometimes doctors might focus on details that the patient does not understand, or forget to answer questions that the patient asks." (b)
Social Factors				
Overcoming Barriers	7 (100.00)	2.00	7	"Difficulties can appear. To manage them, you need a plan. What steps will you take?" (Space provided for participants to write a plan) "Discuss time as a barrier to being active" (a)
Non-family Influences	7 (100.00)	1.71	5	"Behavior changes can be challenging but talking about some of those challenges and problem solving as a group can make it easier." (a)
Non-specific Support	7 (100.00)	1.43	3	"Ask for support when you need it Tell them what you're doing, why it is important to you, and exactly what they can do to help." (b)
Trust and Rapport	1 (14.29)	2.00	1	"Establish an atmosphere of trust, one that is warm, accepting, and non- threatening. Be patient, nonjudgmental, humorous and trusting. Participants need to share their problems with you-remember, in many families, private information is not shared with outsiders." (e)
Mistrust/Lack of rapport	0	0	0	
Fatalism	0	0	0	
Surface				
Cost	5 (71.43)	1.80	4	"Many circumstances influence which "traditional" or "non-traditional" foods people consume. These include their financial means." (d)
Food access	1 (14.29)	1.00	0	"While it is important to introduce and demonstrate new foods, it is important to acknowledge and address the conditions in which many people live. Food insecurity and hunger affects 10-20% of the working poor." (e)
Language consideration	1 (14.29)	2.00	1	"The promotora or another member of the research team will present information on preventing diabetes using PowerPoint slides containing pictures and using simple language." (a)

Table 6.2 (cont'd)				
Nutrition Knowledge	6 (85.71)	1.83	5	"Carbs raise your blood sugar. It is still important to eat some carbs at every meal. Carb foods such as grains, fruit and milk are healthy." (d)
Lack of Nutrition Knowledge	1 (14.29)	1.00	0	"Latinas reported reluctance to new ingredients in their meals and were less receptive to nutrition information that did not consider their typical food preferences." (c)
Physical Activity habits	6 (85.71)	2.00	6	"We are giving all of you a pedometer and think it will be helpful to you to wear this on your belt every day to track the number of steps you take (activity)." (a)
Physical activity preferences	5 (71.43)	1.80	4	"Pick activities you enjoy, like walking." (c) "Dancing – "popular" rather than "traditional" dances especially among younger generations" (d)
Food Preference/Avoidance	5 (71.43)	1.60	3	 "Remember that having diabetes does not mean you have to avoid the food that you like. Instead, the most important thing is to eat the right amount of food for you." (b) "Discuss incorporation of Mexican American dietary preferences into a healthy diet" (f)
Healthcare seeking preferences	5 (71.43)	1.40	2	"In some cultures seeking medical care for depression, as well as other mental health issues, is stigmatized. Be sensitive and matter of fact. Depression is an illness just like other medical condition, and there are effective treatments." (d)

(a) Preventing Diabetes, Un Estilo De Vida Saludable Promotora Manual, no date of publication

(b) The University of Chicago, Picture Good Health, 2015

(c) Viva Bien, 2011

(d) Project Dulce, 2011

(e) University of Chicago, Implementation Guide for the Diabetes Self-Management Education Curriculum, 2007

(f) Diabetes Self-Management Education Longitudinal Intervention Curriculum Guide, no date of publication

With regard to corresponding outcome studies of the intervention for which the curricula were developed for, the average number of surface and deep-level cultural elements found were 5.43 (67.86%) and 17.86 (58.15%), respectively. A summary of the findings for each curriculum are reported in Table 6.3.

The intervention corresponding to the curriculum titled, "Picture good health" was a 6month intervention which was delivered by lay leaders from the church community in a Midwestern, urban setting (100). Glycosylated hemoglobin (A1C), physical activity and dietary behaviors were measured pre and post intervention. In this curriculum, a larger proportion of surface level elements (67.86%) were identified compared to deep level elements (58.15%) in the six curricula. Notably, the deep level elements identified at a level 2, were stress, overcoming barriers addressing general beliefs about diabetes, and food preferences. Although there was a total of 14 elements identified in the curriculum, only four provided a recommended action relating to the cultural element. This curriculum had the lowest number of deep level cultural elements, and five out of the eight surface level cultural elements. All outcomes of interest measured showed improvement in this intervention at 6 months for those in the experimental group compared to the control group. It must be noted that the description of the intervention included the words faith-based and was recommended to be delivered in a church setting.

The curriculum with the most deep-level cultural elements was in the Viva Bien intervention for women in Denver, CO (208). This intervention was a 12-month intervention that measured A1C, dietary intake (calories from saturated fat), physical activities per week, problem solving, self-efficacy, perceived support, stress management and heart disease risk. This curriculum had a total of 20 deep level elements in the curriculum and of these, 14 provided a recommended action relating to the cultural elements. These elements were family influence,

family turmoil, general feelings, stress, health belief, general food beliefs, beliefs about medicine or insulin, depression, general health beliefs or attitudes, physical activity beliefs, healthcare provider support, non-family influences, non-specific support, overcoming barriers and physical activity preferences. It also included five out of the eight surface level cultural elements. Additionally, this curriculum included lessons on smoking cessation and problem solving. The measured outcomes showed improvements for all behavioral measures.

The curriculum corresponding to the Project Dulce intervention had the second most, 19 deep-level and six surface level cultural elements (14, 209). This was a 10-month intervention that measured A1C and change lipids, blood pressure and BMI as outcomes in Southern California. A total of 12 out of the 19 deep-level cultural elements provided recommended actions. This intervention had six out of eight surface level cultural elements. The outcomes showed improvements in all measures. Like the *Promotores* Modules of the Diabetes Self-Management Course, this intervention used a peer-model delivery.

The curriculum with the third most deep-level cultural elements was the *Promotores* Modules of the Diabetes Self-Management Course (16). This was a six-month intervention that measured A1C and diabetes knowledge in the Texas-Mexico border. This curriculum had the most surface-level cultural elements, seven out of eight. There was a total of 16 deep level cultural elements and 12 were coded at a level higher level due to providing a recommended action for that element. This intervention had no change in A1C at 6-months, but it did have an improved diabetes knowledge score from 15.41 to 17.46. This intervention was delivered to participants by community health workers.

The curriculum for the only longitudinal intervention included in the current study was the Diabetes Self-Management Education Program in the Texas-Mexico border (88). This

curriculum included 14 deep-level cultural elements, of which 10 provided a recommended action, and six out of eight surface-level cultural elements. The corresponding intervention measured changes at 12 months for several biomedical and psychoeducational indicators. These include A1C, fasting blood glucose, cholesterol, triglycerides, BMI, beliefs about control, barriers, social support, benefits, impact of job and diabetes knowledge. Only fasting blood glucose, cholesterol, beliefs about control, and diabetes knowledge showed improvements although the improvements were not significant.

In the initial review of the literature, the study that reported results from a "culturally tailored education to promote lifestyle change in Mexican-Americans with T2DM," was identified for the current study for T2DM self-management (129). Upon obtaining the curriculum from the author, it was determined that the curriculum titled, "*Un Estilo de Vida Saludable*" was developed as a diabetes prevention program and was administered to individuals with T2DM although it was not designed for T2DM self-management. Additionally, this program was adapted from Project Dulce which was a diabetes-self management curriculum also included in the current study (209). *Un Estilo de Vida Saludable* was delivered to participants in Tucson, AZ, it included 19 deep-level cultural elements and only half of these had a recommended action. It also had five out of eight surface level cultural elements. The outcomes measured in the 5-month intervention included were A1C, diabetes knowledge, self-efficacy, and blood glucose, however, these changes were not reported. Change in BMI and steps per day both improved, BMI changed from 30.6 to 29.8 and daily steps changed from 4,175 to 7,238.

From the curricula reviewed, one could potentially be recommended for use in other communities. Project Dulce intervention had the largest change in A1c, included a large number of deep and surface level cultural elements and the intervention was delivered using a peer model

(14, 209). Additionally, upon reviewing the curriculum, it contained the most detail with instructions for the facilitator, suggested activities and handouts and additionally, the facilitator curriculum was available in its entirety in both English and Spanish. This curriculum did not rely on the peer-educators to provide the correct translation to the participants and perhaps may have influenced the outcome of a decrease of 1.4% in the A1c at 10-months.

Table 6.3 Cultural elements identified in diabetes self-management	curricula examined and	d intervention outcomes	reported in
corresponding studies.			

	Intervention Findin	gs	Surface Level Elements n (%)	Deep Level Elements n (%)	
Curriculum Name	Change in Hemoglobin A1C	Changes in other Nutrition-related Laboratory Values and BMI	Changes in Diet and Physical Activity Behaviors	n=8	n=35
Picture Good Health, 2015	Baseline to 6 months: 8.2 to 7.8	6-month: Low Density Lipoprotein 109.4mg/dL to 104.5mg/dL	6-month: High fat foods 2.76 to 1.59 At least 5 servings of fruits and vegetables 3.15 to 4.49 Physical activity 1.34 to 2.90 activities	5 (62.50)	18 (51.13)
Viva Bien, 2011	Baseline to 12 months: 8.5 to 8.2	NA	6-month: Calories from saturated fat 12% to 10 % Sessions of physical activity per week 3.8 to 7.1	5 (62.50)	20 (57.14)
Promotores, Modules of the Diabetes Self- Management Course 2008	6 months: No Change	NA	NA	7 (87.50)	16 (45.71)
Diabetes Self- Management Education (2002)	Baseline to 12 months: 11.81 to 10.89	Baseline to 12 months: Fasting Blood Glucose 213.01 to 194.95 Cholesterol 211.83 to 189.88 Triglycerides 215.35 to 214.43 Body Mass Index 32.33 to 32.17	NA	6 (75.00)	14 (40.00)

Table 6.3 (cont'd)

Project Dulce 2011	Baseline to 10- months: A1C 10.5 to 9.1	Baseline to 10-month: Total cholesterol 197.0 mg/dL to 186.8 mg/dL High Density Lipoprotein 45.7 mg/dL to 48.1mg/dL Low Density Lipoprotein 109.6 mg/dL to 99.4 mg/dL Triglycerides 210.4 mg/dL to 182.3 mg/dL Systolic Blood Pressure mmHg 123.9 to 118.9 Diastolic Blood Pressure mmHg 74.8 to 71.8 BMI kg/m ² 30.96 to 30.90		6 (75.00)	19 (54.29)
Un Estilo de Vida Saludable - Diabetes Prevention program, 2014	Baseline to 4- weeks: Reported improvement (not statistically significant, data not provided)	Baseline to 4-weeks: Body Mass Index 30.6 to 29.8	Baseline to 4-weeks: Daily steps 4,175 to 7,238	5 (62.50)	19 (54.29)

E. Discussion

Limited details were provided in the published outcome studies relative to the cultural adaptations and development of the intervention curricula. It is common to include less detail about the cultural elements and what changes were made to the curriculum as a result of the cultural adaptation process. One reason may be the limitations on words in manuscripts for publication and the emphasis on reporting outcomes versus the process of cultural adaptations in the curricula. Hence, more deep-level cultural elements were identified through content analysis than what is typically described in the studies regarding the cultural adaptations made to the curricula.

Most of the curricula provided elements for self-management as recommended by the American Diabetes Association Standards of Care (18). It was interesting to note that most of the curricula also provided specific objectives for both nutrition and physical activity for each lesson; however, the number of lessons varied greatly ranging from as many as 26 to as few as five, and one curriculum was not clear as to how many lessons the intervention entailed.

In examining the surface level cultural elements identified in the curricula, not all surface level elements provided an activity or behavior recommendation to the facilitator reading the guide. Additionally, half of the curricula were only provided in English, indicating that translation of the material is not specified and perhaps left to the facilitator. It is important to provide consistent information in a different language, not just English since it may not be the dominant language in the target population (210, 211). Additionally, some Spanish-speakers may have different names for the same food, for example, avocado in Mexico is called an *aguacate* but in Peru, it is known as *palta* (212). Therefore, in these curricula that are "culturally adapted"

it would be important to differentiate cultural identity and provide culture-specific relevant examples.

Although the "Diabetes Self-Management Education Longitudinal Intervention Curriculum Guide" curriculum had the least number of deep-level cultural elements, the intervention has been ongoing for over 20 years, and positive behavior change outcomes are evident in the quantitative analyses on the intervention (56). This allows us to speculate that the written curriculum may not include the detail and insight provided in practice by the researchers, healthcare professionals, and peer-educators/promotores de salud, that often go unrecorded and published in scholarly work. Based on findings from the current study, it is recommended that researchers develop a better system for recording cultural adaptations and include them as part of the process and intervention evaluation. This information, if widely shared, could aid other researchers in several ways. First, by providing more detail in the process of cultural adaptation, we may better define what this term really means for T2DM self-management interventions and allow for more effective interventions by other researchers and practitioners interested in integrating these adaptations into their own work. Next, having more information may allow a better, more systematic comparison of cultural adaptations to examine which specific elements of the cultural adaptation process lead to better self-efficacy among participants. Additionally, by sharing these data, researchers can inform future research, collaborate and develop more costeffective and efficient interventions for this rapidly growing, underserved population, and build more evidenced-based practices in cultural adaptation of interventions for all chronic diseases, especially those that are diet related.

A good example of how this process can lead to better intervention evaluations is the Expanded Food and Nutrition Education Program (EFNEP) (213). A study used qualitative

content analysis methodology to assess three EFNEP curricula that met strict criteria relative to measuring outcomes, specifically nutrition, PA and food safety (213). The analysis of the three EFNEP curricula was completed by using a coding protocol to ensure a systemic framework for identifying themes, and the results allowed researchers to develop core items for measuring outcomes of the program. This work led to recommendations for how to best evaluate outcomes of EFNEP through content appropriate measures and items.

One limitation of the current study is that many interventions are not comparable due to the variability in the process of adaptation and expected outcomes. The reason is that many diabetes interventions are tailored for the target audience and regional differences exist with regards to generation status, length of time living in the U.S. and also availability and access to healthful foods and healthcare (140, 148). Therefore, it was not the goal of the current study to predict or recommend cultural adaptations that lead to behavior change, but rather assess if and how they are used as well as implications for intervention curricula design and evaluations.

One study that examined randomly controlled trials (RCTs) of culturally tailored diabetes interventions for minority populations reported that key factors that enhanced diabetes education were culturally appropriate diabetes interventions designed either through earlier experience working with the community of interest or through qualitative methods prior to intervention (214). Qualitative studies were used to inform the studies on culture or religious beliefs and preferences and literacy skills of the community. Recommendations for settings and approach of intervention were also provided, but the advantages and disadvantages of the settings were not discussed in the RCTs (214). Only one curriculum in the current study included a statement regarding the setting of the intervention, which was designed to be delivered in a church environment (100). Describing the setting for delivery of the curriculum is an important cultural

consideration as other interventions delivered to targeted communities, especially those that are underserved, are more likely to have success when the intervention is delivered to them in a familiar community setting (103, 215-217). The "Picture Good Health" curriculum was also described a faith-based intervention. Faith based interventions incorporate a deep-level cultural element, religion, by encouraging behavior change using spiritual messages (100). Finally, the types of providers or facilitators are also important because they are often members of the community they work with, have the ability to follow-up with participants and have cultural knowledge to offer in the delivery of the interventions (214). In the current study, it was often unclear who the intended facilitator for delivering the intervention should be. In some cases, recommendations were made to bring in an expert, for example a registered dietitian, to provide medical nutrition therapy recommendations for carbohydrate foods and carbohydrate counting.

F. Conclusions

Some T2DM self-management intervention curricula include culture-specific aspects relative to behavior changes, but it is unknown which of these influence T2DM self-management behaviors and outcomes. Although most of the curricula had a higher proportion of surface level cultural elements compared to deep level as hypothesized, it was not clear which cultural elements led to long-term behavior change in self-management interventions even after examining the outcomes. Additionally, some of the aspects of culture that Mexican-Americans felt were important to them, based on findings from the first study in this dissertation, were not addressed in the curricula. Some of these diabetes-related cultural aspects include topics on the gender, shame, *fatalismo*, religion, health beliefs about *susto* and tea and religion (90, 170, 173, 218, 219).

Some of cultural elements may not directly impact self-management behaviors; they may be integrated into diabetes interventions and potentially have a positive effect on glycemic status, and consequently build rapport with the participants. For example, from a nutrition perspective, several studies showed that Mexican-Americans take certain teas for diabetes (90, 122). By exploring different types of teas, especially those which have no medication interactions and are also popular with Mexican-Americans, such as chamomile, hibiscus and cinnamon, culturally sensitive recommendations can be made (90, 220). Another example is to include one or more of these types of teas in the list of no-calorie or low-calorie beverages and consequently, participants may be more receptive to other behavior change recommendations provided. With regards to gender, it is traditionally a responsibility of the mother to cook, purchase food and make food choices for the whole family (95). Hence, it can be recommended in culturally tailored curricula to engage intervention participants in dialogue relative to gender roles and involvement of the whole family to make healthy food choices together.

Relative to the questions "How do T2DM self-management intervention curriculum outcomes relate to cultural elements in T2DM self-management interventions for Mexican-Americans?" we found in the current study that there are several aspects of culture being addressed in curricula. In research studies, culture is sometimes interpreted as a barrier to health (209, 221).

Through the current study, we can explore ways to interpret culture as a facilitator towards health outcomes. It has not been investigated if and how encouraging healthier culturespecific behaviors that are already familiar to the target population influence outcomes. The outcomes of the corresponding curricula examined in the current study were either positive (14, 88, 100, 208), or had no effect (16, 129). Not all curricula described details on the training and

fidelity of the facilitators, the time that was spent on delivering the curriculum and how to address cultural health beliefs. Only one curriculum provided sample prompts on how to respond to "incorrect" answers by the participants (14). Training facilitators on how to create dialogue with participants who are of a different ethnicity may also be beneficial.

Although we expected to see studies that incorporated more deep level cultural elements to have positive behavioral outcomes, this was not clear in the evidence reviewed given that not all interventions provided behavioral changes as a result of the intervention. Several areas relative to cultural elements were highlighted for future studies to examine in relation to T2DM self-management behaviors. Finally, an important consideration is that Mexican-Americans are not a homogenous group who share all cultural beliefs and values. Health beliefs, religious rituals and practices and especially food vary depending on the region of Mexico people relocate from. Hence, it is important to know commonalities, and recognize that variability will also exist.

CHAPTER 7 – Summary and Conclusions

Type 2 diabetes is disproportionately high among Mexican-Americans but specific aspects of how culture plays a role in disease management have not been studied in-depth (2). Culture influences many aspects of diabetes and this study was guided by an overarching goal to enhance understanding of how dietetics and nutrition professionals can integrate culture into T2DM education for Mexican-Americans.

The first study used a content analysis approach to explore cultural elements reported in qualitative studies. Cultural elements are defined as values, beliefs, ideas or concepts that may potentially influence behaviors. This study focused on cultural elements reported to influence behaviors of Mexican-Americans with type 2 diabetes. Although some cultural elements identified may be common among different cultures, how they manifest into behavior of different populations should be further studied. Cultural elements were characterized and defined on the basis of Resnicow's Model for Cultural Sensitivity in Public Health which divided intervention components into surface and deep level. Forty-four cultural elements perceived by Mexican-Americans that influence some aspect of their own T2DM self-management were identified and defined. The main surface level elements mostly commonly found in the studies were food habits (n=15/19), food preferences (n=14/19), use or acquisition of nutrition knowledge (11/19) and healthcare provider preferences (11/19). The top three deep level elements were General health beliefs or attitudes (n=19/19), Beliefs or attitudes about foods in general (n=17/19) and Family turmoil (n=14/19). PA related cultural elements were rarely found in the research studies examined.

Findings from the first study revealed that Mexican-Americans with T2DM are concerned with more than the usual recommendations based on clinical trials (engagement in regular physical activity, healthy eating, medication adherence, self-monitoring blood glucose,

problem solving, preventing or treating acute and chronic complications and psychosocial aspects of living with T2DM). Health beliefs pertaining to T2DM, ethnic heritage and food were evident throughout the studies examined and are a focus of in the subsequent studies.

The second study builds on the findings of the first study, by exploring how RDNs perceive the cultural elements in their T2DM self-management counseling to Mexican-Americans. In this study, we used a cross-sectional, online questionnaire that was disseminated through the main professional organization for RDNS, the Academy of Nutrition and Dietetics. Participation was voluntary and an incentive was provided. The main findings regarding RDN's perceptions on cultural elements in diabetes counseling show most perceive similar elements to those identified by Mexican-Americans as important. However, these elements vary in importance based on years of experience; the least experienced group averaged 4.62 years, experienced group averaged 19.55 years and the highly experienced group averaged 33.98 years in their profession. The least experienced dietitians rated the surface level cultural elements higher (food habits, food preferences and nutrition knowledge) than the other two groups of RDNs. The highly experienced group of RDNs only rated two deep level cultural elements as more important compared to the other two groups. These were the role of gender and beliefs about *nopales*/cactus in diabetes care, although the differences were not statistically significant. The findings highlight how RDNs are more likely to identify surface level compared to deep level cultural elements, but it also demonstrates that there is a need for knowledge relative to cultural competency topics, on how to integrate deep-level cultural elements into MNT counseling for diabetes.

The third and final study explored the extent to which existing T2DM self-management intervention curricula reflect the surface and deep level cultural elements identified in studies 1

and 2. The top surface level cultural elements found were food habits, food preferences or avoidances, and acquisition and use of nutrition knowledge. The top deep level cultural elements found were overcoming barriers, general health beliefs about diabetes, influence of individuals who are not family members, non-specific support, beliefs about Mexican/cultural foods, family influence and general health beliefs about foods. All of the curricula had a higher proportion of surface level compared to deep level cultural elements.

Findings demonstrate a gap in addressing culture-related issues in T2DM interventions that are perceived to be important by the target population of the interventions, Mexican-Americans. The most frequent twenty-five cultural elements out of the original 40 cultural elements identified by the target population as being influential in their T2DM self-management in the first study were constructed into items for the second study. In the second study, all but five items (three from the deep level and two from the surface level) were found not to be associated with the six factors that were identified. When looking at the strength of associations, perceptions of RDNs relative to the cultural element factors were consistent with perceptions of Mexican-American patients with T2DM, in deeming both deep and surface level cultural elements as important. However, to conduct analyses in this study, 81 observations were excluded because RDNs responded "not sure" relative to the importance of the cultural elements for diabetes care, indicating a need for further training of RDNs who work with this population. Finally, the six curricula examined also revealed some areas that need work. Specifically, some cultural elements not explicitly described in the curricula were shame, machismo, lack of trust, and once again, fatalism. These deep-level cultural elements are not concepts that immediately come to mind when discussion dietary and physical activity behaviors. However, these may influence the decision-making process of individuals, especially among ethnic populations where

these underlying concepts may also influence behaviors. Other cultural elements only found in one of the six curricula were *Susto*, alternative treatments for diabetes that are not food or beverage related, *Marianismo*, lack of healthcare provider support, food access, language considerations, and lack of nutrition knowledge. By including ethnicity-specific cultural elements in intervention curricula, cultural awareness of healthcare providers is increased and thus enhance the effectiveness of the interventions.

Together, these analyses provide a better understanding of how cultural elements are translated into counseling and curriculum aspects of T2DM self-management interventions to potentially enhance efficacy of T2DM self-management interventions for Mexican-Americans. Because T2DM is a disease for which self-management guided by trained healthcare professionals is important, RDNs play a key role in nutrition counseling (1). There is evidence that interventions are more effective when delivered within the context of culture (106, 107, 217), but it is important for research to focus on specific aspects of culture to provide healthcare professionals with evidenced-based guidelines. This is especially important for ethnic populations, which are disproportionately affected by T2DM, such as Mexican-Americans.

Understanding how cultural elements influence care at different levels care for T2DM allows for a better understanding on what healthcare professionals need to do to align the interests of the patient, healthcare professional and ultimately influence patient outcomes. Recommendations for future work are as follows. The cultural elements that had the lowest level of evidence and least frequently found in studies should be examined in among Mexican-Americans to have a better understanding of their concerns and how these elements factor into their T2DM self-management. Second, examining perceptions of other healthcare professionals involved in the diabetes care of a patient may highlight which areas of practice are best likely to achieve behavior changes to achieve glycemic control through culture-specific counseling. Finally, by describing how culturally sensitive and specific recommendations for ethnic populations are integrated into T2DM self-management intervention curricula, more systematic comparisons of cultural elements in interventions can be made.

Some strengths of these studies are that it is the first study attempting to aggregate and characterize cultural elements and their relationship to T2DM as reported by Mexican-Americans in research studies. It is also the first to examine how a group of healthcare professionals, RDNs, perceive these research-based cultural elements relative nutrition and physical activity for T2DM counseling with the population they serve. Some limitations are that the response rate for the second study was not measured using typical survey protocols due to the exploratory nature of the study, and RDNs were asked to identify if they served individuals of Mexican-heritage, but it was not recorded how they arrived to this information (e.g. patient or clinic records, patient language preferences).

This study utilized two different theoretical frameworks as a basis for design and methods. In health interventions, it is important to understand why behaviors occur and what factors surrounding these behaviors play a role. It is well accepted in health behavior research that theory can be used to plan and evaluate programs based on concepts that are inter-related and relationships between the different variables and concepts can be used to predict behaviors (222).

First, Resnicow's Model for Cultural Sensitivity in Public Health categorizes the components of culturally sensitive health interventions into surface and deep-level constructs (17). This model was developed for public health interventions which typically address behaviors prior to disease onset with the goal of disease prevention (17). The second theoretical

model was the Health Belief Model, which provides a framework for how cultural elements are proposed to influence health behaviors of Mexican-Americans with T2DM. To better understand the how interventions are designed and how these theories inform interventions, it is important to distinguish between two types of prevention, primary and secondary prevention. The goal of primary prevention is to intervene before there is onset of disease (124). The goal of secondary prevention is to intervene once the disease is diagnosed in order to prevent or ameliorate complications. (124).

Resnicow's model presents several interesting concepts for public health interventions which are typically health promotion and primary prevention programs. In his model provides researchers with two dimensions of for defining cultural sensitivity, surface and deep level dimensions (17). These levels were used as guidelines to categorize ideas that were reported by Mexican-Americans into surface of deep level. This was a strength of the model because it allowed researchers to examine the groupings of cultural elements and how well these were represented in the curricula. Another strength of this model is that the categorizations allowed for testing on how the cultural elements were perceived by RDNs. A limitation of this model is that not all of the cultural elements identified fit neatly into the surface or deep level categories. In some cases, cultural elements could fluctuate between the dimensions, depending on the perspective from which the element was considered. For example, the use of para-professionals was defined as a surface level element since the para-professionals matched the characteristics of the population being served. However, para-professionals are often members of the community they are hired to provide education to, and it is unclear what cultural sensitivity strategies paraprofessionals integrate into their delivery of education. These strategies, rarely captured by researchers, may include deep-level dimensions such as acknowledging health beliefs, the role of

religion or family during the intervention. Thus, it may be argued that the use of paraprofessionals may fall under both the surface and the deep-level dimensions of the cultural sensitivity in the public health model, because of who is delivering the education (surface) and what strategies (deep) they are using to deliver the education.

This example captures another limitation of the model which highlights the complexity of the role of culture in research. This model does not fully explain how one cultural element can fluctuate between surface and deep level dimensions, and to what extent can one or both of these dimensions influence expected behavioral outcomes. Some important questions to consider in future research is relative to the two dimensions. First, do the elements need to be present in interventions at both dimensions or is it sufficient for the element to be present in only one dimension to influence behavior change? If the latter is true, which dimension is more likely to lead to behavior change?

The Health Belief Model provides a strong basis for understanding why people do not follow disease prevention recommendations (124). Thus, this model informs researchers how disease susceptibility influences individual level perceptions of risk and if that translates into positive behaviors to ameliorate that risk. A meta-analysis of studies measuring effectiveness of predicting behaviors in studies using the Health Belief Model, researchers found that one construct was stronger in predicting behaviors, perceived benefits and barriers (223). This same study found that it was more difficult to predict behaviors when the outcome measured was adherence to a treatment plan compared to the prevention of a negative health outcome (223). Therefore, a strength of this model is that it serves as a guide for developing disease prevention interventions or programs, concurrently used with disease-specific research. In diabetes prevention and self-management of type 2 diabetes, the Health Belief Model provides a

systematic approach in identifying both barriers to desired behaviors and ways to overcome these barriers (224), identifying what types perceived susceptibilities may influence behaviors for threat reduction (225) and regardless of literacy level, individuals with type 2 diabetes perceive diabetes medications as beneficial for better disease management (226). One other strength of the Health Belief Model is that it is patient-centered, offering healthcare professionals insight into what type of patient-perceptions influence desired health behaviors. This approach informs healthcare professions what aspects to address or acknowledge in providing care.

However, several limitations must also be acknowledged. First, the Health Belief Model does not predict whether desired behaviors will be performed as the model was initially developed for. It is valuable in development of primary prevention interventions and programs (223). Second, it is unclear how well the model fits for an individual already diagnosed with the disease, where the threat and perception of severity may differ than an individual who is at risk for getting the disease in question. Finally, it is unclear how culture fits in the model. In some studies, culture is perceived as a barrier to desired behaviors, however, it is plausible that this is due to the medical model/theory of the healthcare professional approach to care, limits the interpretation of culture (202).

A limitation of both models is that they were developed to better understand disease prevention (primary prevention). Therefore, these models may not independently inform development of behavior interventions for secondary prevention, such as would be needed for a disease like type 2 diabetes. Additionally, cultural elements may not fall neatly into the constructs of these models, suggesting that a different type of model, perhaps a multidimensional or adaptive model, may better predict desired health behaviors among ethnically diverse populations with diagnosed chronic diseases.

The first study, presented in Chapter 4, may be replicated with other populations of interest or disease conditions. Future studies may examine how the specific cultural elements identified influence other aspects of T2DM self-management such as foot care, self-monitoring blood glucose levels and medication adherence. Additionally, it is recommended that future qualitative syntheses establish more specific criteria for inclusion relative to study design such as inclusion of patients or both patients and family members and participants, and criteria relative to important aspects of qualitative studies such as a clear explanation of how data saturation was reached and if and how triangulation was done (183).

Findings from the second study, presented in chapter 5, provide information regarding important cultural elements that RDNs integrate into T2DM counseling. Future studies may examine how para-professionals (e.g. *promotoras*) integrate culture into their health education programs especially those who include diet and physical activity to identify and capture what it means to provide culturally sensitive education. This can lead to better guidance in training manuals and curricula designed for ethnically diverse populations; formulating and testing how different cultural sensitivity components affect desired health behaviors; and compare how different cultures respond to culturally sensitive education programs when integrating components into existing education programs and curricula. Public health is costly and many interventions have been developed to meet the needs of the majority and some minority populations in the U.S. (244-246). These "interventions in-a-box" have aided in improving some health outcomes, but they have also highlighted their limitations in achieving target population specific public health goals (247).

Findings from the third study, presented in chapter 6, provide evidence for the need to integrate more culturally sensitive components for T2DM education targeting ethnically diverse

populations. Our findings can be used to develop guidelines for T2DM self-management interventions with Mexican-Americans.

Overall, cultural elements need to be further studied to examine how they manifest in different populations with regard to behaviors affecting T2DM self-management. For example, it is plausible that family turmoil or conflict may manifest differently between Mexican-Americans versus Chinese-Americans, given the differences in how disagreements are resolved within the family (249). Thus, examining how cultural elements manifest in the daily lives of an individual with T2DM may elucidate how these then manifest as behaviors that are related to selfmanagement. Findings from this study, elucidate the importance of considering family, health beliefs, beliefs about foods, beliefs about herbal or traditional treatments, emotions, gender and religion may have some influence into T2DM self-management outcomes in addition to healthcare access, language, existing food and physical activity habits and preferences. Healthcare professionals may learn about these cultural elements through an approach ("mini ethnography") developed by Arthur Kleinman and Peter Benson (249). This approach consists of eight open ended questions that may elucidate how these cultural elements factor in their disease and associated behaviors (249). In combination with motivational interviewing, the questions create a culturally sensitive environment and approach for health care professionals, especially RDNs who work with diverse audiences (186).

APPENDICES

APPENDIX A: Cultural Elements Coding Protocol, Study 1

AIM 1 – CULTURAL ELEMENTS PROTOCOL V5

Introduction

This goal of this protocol is to identify and characterize cultural perceptions of diet and physical activity for self-management education by Mexican-American adults with type 2 diabetes (T2DM). This protocol focuses on the perspectives of Mexican-Americans with T2DM identified in qualitative studies that utilized focus groups or in-depth interviews.

Qualitative research is used to capture the voices and perspectives of the Mexican-American subjects living with T2DM. By examining the content in research studies, we can identify the most prominent evidenced-based cultural influences for diet and physical activity that relate to T2DM self-management. It is then possible to examine how these cultural elements are utilized in different areas of T2DM self-management education and interventions. The cultural influences described below were generated through a preliminary review of the qualitative studies that met criteria for analysis. These are the most common and prominent cultural elements found in the literature. If additional elements were identified through the content analysis process during coding, they were subsequently discussed and added. For the new elements that were added, previous studies where these elements were not part of the protocol were revisited.

Theoretical Model

This research is framed around Resnicow's model for cultural sensitivity in public health and the Health Belief Model (17). Resnicow et. al. developed a framework to categorize the components of culturally sensitive health interventions whose goals are to change health behaviors or target populations (17). This approach distinguishes elements of culture in surface level and deep level constructs. Elements that fit in surface level include language preference, channel of information delivery, settings where intervention and recruitment for intervention occur, and preferences for the ethnicity, gender, age and language of delivery agent (110). Elements that make up deep level include social support and social support networks (11, 14-16), including family members and utilizing the cultural belief on familismo (92, 110), literacy levels (110) and a variety of other cultural beliefs on health and foods (122). Many of the cultural elements that are categorized as deep structure are not often described in quantitative studies that evaluate outcomes of interventions. Often, studies of qualitative nature corresponding to interventions are more likely to identify themes that fit into the deep structure level.

Conceptual Definitions of Cultural Elements for Content Analysis

Drawing from Resnicow's model for cultural sensitivity in public health, elements of culture that influence behavior change are categorized as two types: Surface Level and Deep Level (17). How Mexican-Americans perceive the cultural elements results from these categorizations are further explained and interpreted in the context of the Health Belief Model. In this coding protocol, conceptual definitions were derived from several sources of literature relative to T2DM self-management. The fields of study on this topic range from medical to
social sciences due to increase interest in behavioral aspects of T2DM self-management, and the focus in this study pertains to Mexican-Americans. The references for the definitions used in this protocol is found in the subsequent Cultural Elements section.

"Surface level" reflects the cultural elements that include food preferences. It is well known that culture largely influences lifestyle behaviors including food choices (76, 119, 120). Food preferences can include things like tortillas, beans, nopales (prickly cactus), and chayote (prickly pear cactus). The food preferences under surface level do not have significance beyond preference. If a food preference is identified and there is an associated belief about the food, such as having curative or health-properties, this food would fall into the deep level elements.

Other surface level elements include the following examples. A particular *setting* is often chosen specifically to recruit targeted participants or conduct the research, intervention or education because it is convenient for or frequently used by the targeted participants (110). Setting is considered a surface level element.

The delivery method for diabetes interventions can also influence the success of individual's T2DM self-management success. A review of intervention features targeting disadvantaged populations showed that one-on-one interventions were not only more successful in achieving improvements in self-management but participation and retention in the intervention also tend to be higher (118).

Language refers to the means of communication between individuals. This element includes a preference for one's native language over English when speaking, consuming media and interacting socially (119).

Some of these elements are supported by other intervention literature to be typical components of what is often referred to as cultural tailoring. One example is the use of community educators (e.g. paraprofessionals, lay health workers, *promotoras*) that are bilingual and bicultural (117, 118).

"Deep level," on the other hand, relates to elements such as social support and social support networks (11, 14-16), including family members and utilizing the cultural belief on *familismo*, (92, 110) literacy levels (110) and a variety of other cultural beliefs on health and foods (122). Many of the cultural elements that are categorized as deep level are not often described in quantitative studies that evaluate outcomes of interventions. Often, studies of qualitative nature corresponding to interventions are more likely to identify themes that fit into the deep level.

Familismo is defined as the belief that the family is more important than the individual (91, 123). This notion can extend beyond one's own family and extend to people who also have responsibility or provide care for an individual such as a doctor, nurse or clinic staff person. The belief that foods have certain healing properties also falls into this deep level element of culture. For example, many Mexican-Americans believe that *nopales*, a common food in the Mexican diet, contain properties that help with T2DM (87). Other beliefs may include foods such as tea (122).

Both levels of cultural elements may be described in different types of studies related to T2DM self-management. However, content analysis of qualitative studies that focus on the perceptions of Mexican-Americans with T2DM was used to specify and define some of these cultural elements.

1. Content Analysis Procedures

Data Collection

This protocol describes a systematic procedure and definitions for applying these descriptions of cultural elements which aim to assess how these are reported in the literature. Because these concepts are not typically described in all individual qualitative research studies on the topic, it is necessary to explore multiple qualitative focus group and in-depth interview studies. Content analysis of studies not utilizing qualitative research methods do not provide the depth of Mexican-American perceptions, therefore, quantitative studies are not included in this research.

Content Universe:

Culture does not change over short periods of time; however, it is important to capture recent studies examining the topic. Therefore, a purposive, systematic sample of qualitative indepth interviews and focus group studies meeting criteria described in section 3.1 of this work was used. The year 2000 was established as a cut point for several reasons including capturing the most recent (10-15 years) and relevant knowledge regarding culture. Hispanic subgroups were first identified in large nutrition related surveys such as Hispanic Health and Nutrition Examination Survey in 1982-84 (140), and interest in studying these subgroups yielded research studies in subsequent years. Recognition of the differences between Hispanic subgroups by the U.S. government began with the 2000 U.S. Census survey (141). Although a random sampling of studies would yield representative perceptions of cultural elements, the body of literature is not large enough to complete such sampling. Establishing a time range of research studies and utilizing purposive sampling, ensures a more comprehensive list of cultural elements.

The content universe of studies includes several aspects that are common in qualitative research. The following definitions provide a clear understanding of the data collected for this study.

1.1 Literature Selection:

The content analysis method described in this protocol is most directly applied to qualitative in-depth interviews or focus group research studies found in peer reviewed journals. These definitions are common among qualitative research methods.

In-depth interview studies use an open-ended, conversation-like method of collecting information from the perspective of the study participants. In-depth interviews typically use a structured or semi-structured interview process that allows the researcher to understand perceptions and how or why perceptions may exist about a certain topic. This approach allows the participant in the study to express their own ideas or priorities (227).

Focus group studies involve a small group of individuals sharing what their perspectives, priorities and concerns are about a topic. This approach has an advantage in eliciting a collective point of view or understanding of a topic that is inherent in the interactive nature of this method (227).

Excluded from these studies are ethnographies and intervention studies with qualitative findings used as support for quantitative findings. Ethnographic studies allow researchers to become immersed in the culture to understand social behaviors (138, 171). With focus groups and in-depth interviews, participants provide more than one point of view and can offer insight in possible disagreements or describe a different understanding or reason for their perceptions. With an ethnographic study, you may not hear contrasting or different explanations for phenomena as you may with focus groups and in-depth interviews (171). Some quantitative studies provide limited qualitative findings gained from the study design or methods, but details are typically not provided when the study focuses on the quantitative findings. These kinds of studies may hence neglect to provide more insight to better understanding or of defining concepts or phenomena. Therefore, these two type of studies were not included. They may provide some information, but not in the depth that is necessary to understand behaviors for the purpose of this study.

1.2 Journal/Source(s)

A source or journal is cited as the provider of research studies that were sought to populate the content sample, in this case, articles for this study. Articles were obtained from a peer-reviewed journal or source. Articles published in these types of journals have been subjected to a review process by other scholarly experts in the same field of study. Articles from other types of journals were not included in this study.

2. Cultural element:

A cultural element is a concept that is reported in the research study of interest to have an effect or influence on behaviors. Because this study, criteria are specific to Mexican-Americans, elements identified in the research may be specific or general elements that influence behaviors related to T2DM self-management. Although culture can be defined as, "integrated patterns of behavior, including thoughts, verbal and nonverbal language, actions, customs, beliefs, values, and institutions of racial, ethnic religious or social groups" (111), in examining culture from an ethnic heritage perspective is of specific interest. Therefore, in this study, cultural elements are defined as symbols, language, values and norms that are common or shared among individuals to influence actions such as dietary or physical activity behaviors.

Data Processing Procedures

Accessing/Storing Content

Access and storage of articles were completed through the Michigan State University Libraries' relevant databases for scholarly work. The articles were downloaded and saved to a network folder and backed up to a Michigan State University cloud storage to increase accessibility by the researchers.

Processing/Preparing of Content

The articles were saved either in pdf, word or html formats. The following procedure would apply for measuring cultural elements in the results section of the study.

Each paragraph in the results of each article was examined for cultural elements and be marked, either through annotated method in the text or by referencing the pages, paragraph number and sentence number in a separate word document.

To assess whether a cultural element is present, the following definitions were used.

Coder Preparation

Coder Selection

Familiarity with Mexican-American culture is necessary to clearly identify elements reported in the research articles selected for the study. Specifically, the coders need to know how to identify the results section of peer-reviewed journal articles. If the coder was not familiar with the concepts of culture, the coder was provided with literature that provided fundamental information (6, 17) in addition to version 1 of this protocol and held discussion with primary research prior to commencement of coding.

The actual coding, requires only that coders recognize paragraphs in the results section of the articles and whether or not the cultural elements below appear as they are defined. Cultural elements that are not defined below were added by research when identified by coders. Codes are organized by categories in a subsequent section. There was a total of six versions of the coding protocol as new elements were identified, defined and added. The version in which the cultural element was added is noted with $(V^{\#})$.

Coder Training

Coder training proceeds in the following steps:

- 1. The protocol was read-through by at least two coders.
- 2. Coders collectively discuss and apply the protocol to examples.
- 3. Coders apply the protocol individually to sample articles.
- 4. Coding comparisons of sample articles were discussed and disagreements were clarified.
- 5. Modification of the coding protocol and/or examples were completed in an iterative process. This allows the addition of cultural elements that have not appeared in previous articles.
- 6. These steps are repeated until high inter-rater reliability levels were reached. If after discussing discrepancies between coders, inter-rater reliability of the item was low, it was not included for interpretation of findings.

Although the above training steps apply to the "practice" period, and is best undertaken with material not in the sample of content that were coded for the study, we started with articles included the sample due to limited availability of articles. In addition, since this exploratory study identifies and defines cultural elements, actual articles were necessary to develop and modify the coding protocol as cultural elements that have not previously appeared were added. Study supervisor conducted reliability testing for the study, discussed later, to ensure that new and modified coding were applied to earlier articles not coded for these.

Coding Procedures

Coding decisions for the cultural elements described below were intended to be relatively simple, once the conceptual and operational definitions are grasped by coders. The practical limitations on coding in this study may arise from the complexity of some of the definitions, especially as new cultural elements are identified from the articles.

If variables are as simple as the identifying cultural elements, coders can work for several hours a day with brief breaks. In some cases, coders may need to reconvene to compare new cultural elements identified if any and discuss how these were defined. The total time for this coding project was approximately 80 hours, and meetings were held a total of 10 times coders convene to discuss disagreements and new cultural elements identified.

Content Variable Operational Definitions

The operational definition of the cultural elements relies on the identification by coders in the selected articles for analysis. Using at least two coders allow for maximizing and or refining the findings.

Journal/Source

A source is the name of the journal that is publishing the relevant articles. The journals are categorized as follows:

[1] nutrition specific journal – Journals which are focused on publishing nutrition research typically includes the word nutrition and/or dietetics in the title. A web search for the journal's "about this journal" section provides explicit information on the topics that are considered for publication in the journal. Examples: Journal of the Academy of Nutrition and Dietetics, Journal of Nutrition Education and Behavior, Journal of Nutrition, Public Health Nutrition etc.

[2] diabetes specific journal – Journals which are focused on publishing research related to diabetes topics and may include the word "diabetes" in the title. A web search for the journal's "about this journal" section provides explicit information on the topics that are considered for publication in the journal. Examples: Journal of Diabetes and its Complications, Diabetes Education, Diabetes Care, etc.

[3] public health or healthcare related journal – Journals which are focused on publishing research related to public health or general healthcare topics may include either of these words in the title. A web search for the journal's "about this journal" section provides explicit information on the topics that are considered for publication in the journal. Examples: American Journal of Public Health, Public Health, Journal of Health Communication, etc.

[4] social or behavioral sciences journal – Journals which are focused on publishing research related to social sciences, sociology, and behavioral sciences, topics may include either of these words in the title. A web search for the journal's "about this journal" section provides explicit information on the topics that are considered for publication in the journal. Examples: Journal of Immigrant and Minority Health, Hispanic Journal of Behavioral Sciences, Journal of Applied Behavioral Sciences, etc.

When journals have more than one of the described words in the title, it is categorized according to from specific to less specific topics. For example, if a journal is titled European Journal of Public Health and Diabetes, it was categorized as [2] because diabetes because is a specific disease compared to the term public health, which is a broader term [3]. The categories are ordered from specific to less specific topics.

Cultural Elements

Each article is assessed for the 9 categories of cultural elements which follow and each

component was given a rating from 0-2 as follows:

A [0] indicates that no, the element is not present in the study as defined. A [1] was used to indicate that yes, the element is present, through either description or definition in the study as defined in the coding protocol.

A [2] indicates that the element is present in the study through either description or as defined in the coding protocol AND a quote or example derived from the data were presented as evidence.

1) FAMILY ELEMENTS

Familismo (V1) - This value is defined as the belief that the family is more important than the individual (91, 92). This element can extend beyond one's own family to people who also have responsibility or provide care for an individual such as a doctor, nurse or clinic staff person. Important decisions are made for the family benefit versus the individual making the decision (80). For example, "Ofelia was aware that she could improve and maintain the health and wellbeing of her family members, and herself, by controlling food intake" (228).

Influence of family (V2) – This element refers to the patient being influenced by family members into making decisions about their own behaviors. This is different from *familismo* in that the patient is making the decision for themselves and not for the good of the family. Therefore, there is an attempt to influence behaviors of the individual with diabetes. Example: "My daughter tells me that I shouldn't eat fatty foods and I should go to the gym wither her" (229).

Family turmoil (V3) – This element refers to family involvement that has a negative effect on mental or physical health. A type of disturbance, confusion or uncertainty may be described and attributed to a family member(s) or caused by a family member(s) which is subsequently attributed to resulting in a negative outcome such as eating poorly, not being active,

getting sick, etc. For example, "She doesn't know what she's talking about and that's the way the whole family speaks to me in a condescending way and it makes me want to eat what's in front of me even more" (229).

2) EMOTIONS ELEMENTS

Shame regarding diabetes (V4) – This element represents the patient's feelings regarding a diabetes diagnosis or self-management aspects (nutrition, medicine, physical activity, etc.), and sharing these with others. In some cases, it was discussed as part of adhering to self-management practices in front of others. Example: "I was so ashamed. I was ashamed that people might learn I was sick. I thought if I did not say anything about it, I was ok" (173).

Anger (V5) - The element of anger refers to a settled way of thinking or feeling about someone or something, which is expressed as annoyance, displeasure, or hostility. Anger can be placed towards themselves or towards diabetes, health, people, treatments, diet, and any activity/regiment related to T2DM self-management. In this element anger has implications for health or health outcomes. For example: "I feel mad, not everything you like is included the diet. You want to make me mad? Serve me some fish or chicken" (40).

3) FOOD ELEMENTS

Food habits (V1) – Habits are regular tendencies or practices, routines, patterns or traditions. A selection of foods can be based, but are not limited to, cultural reasons, or because these foods are commonly consumed by the culture. Some food habits are related to cultural practices and cultural norms of an individual (40). A food habit was recognized as an act that is happening currently. For example, "To eat right, [the doctor] gives me a thing that I can follow. Sometimes I follow it, and sometimes I don't, you know? When it's the holidays, you don't follow anything" (228).

Food preference/avoidance (V1) – Preference is a greater liking toward one alternative over another. Preferring one food over another based on cultural reasons such as beliefs, familiarity, and norms. There is a <u>liking and leaning</u>, but not necessarily a habit or tendency. Example, "What they tell you to eat and, no, no, no, I <u>like</u> my tortillas, I <u>like</u> my bread, I <u>like</u> my hamburgers, I <u>like</u> my doughnuts, I <u>like</u> my fried chicken..." (40).

Acquisition of nutrition knowledge (V1) – Acquisition of nutrition knowledge can happen through observation (e.g. a cooking demonstration), formal nutrition education (e.g. a diabetes class with a RDN) or through written informational education handouts (e.g. a food pyramid or portion plate) (228). Example, "Participants who reported that they actively follow a recommended diet learned about healthy food preparation and portion sizes through observation. Manuela had lived with a family of vegetarians (as an employee) and Ofelia had recently spent a week in the hospital; in both cases, each had the opportunity to observe healthy meal portions or preparation" (228).

Religious influence on food avoidance (V1) - The practice of avoiding or withdrawing from a particular food due to a religious influence, belief or ritual. Examples, fasting on Fridays

during lent or avoiding red meat. Muslims have rules about meats and if they are prohibited they refer to them as Haaram. (230)

Religion-related food preferences (V1) - Preferring one food over another based on religious beliefs, practices or rituals. Jewish people have rules about the slaughtering of animals and the types of animals that are acceptable according to the Torah and these are typically referred to as Kosher foods. Muslims have rules about meats and if they are permitted they refer to them as Halal (230). The most common religion among Mexican-Americans is Catholicism and with this religion, some Catholics use lent as an opportunity to give up an unhealthy behavior (219). This could range from giving up meat on Fridays to chocolate for the full duration of lent.

Health belief or attitude, tea (V1) - See health belief or attitude description. A tea can be a hot drink made by infusing dried or crushed leaves/herbs in boiling or hot water. This element describes attributing health properties or beliefs to a tea. Some Mexican-American specific examples include Diabetil tea, Huereque tea, Werke tea or Malabar tea (90).

Health belief or attitude, foods general (V2) - See health belief or attitude description. This element describes a health belief or attitude towards food in general. An example of this is, "I told the doctors, I said I don't eat that much kind of sweets. He said, no, it's from generation. Well I don't eat too much sweets, you know I thought it was from sweets you know" (231).

Lack of Nutrition Knowledge (V4) – Lack of nutrition knowledge can be represented as stating the patient has no formal nutrition education (e.g. never taken a diabetes class) or as frustration with not knowing what and how much to eat to successfully manage diabetes. Example: "I wish I had a better understanding of diet. Even though I'm a cook that doesn't mean I'm a nutritionist" (232).

Beliefs or attitude about Mexican/cultural foods (V5) – This element describes a perception or attitude attributed towards cultural or Mexican foods in general. Diet is a key aspect of T2DM self-management and recommendations for dietary behavior change for T2DM especially in regards to cultural foods by Mexican-Americans may be perceived as both a barrier or facilitator (12). "Like us Hispanics it's hard for us to eat foods that do not contain much fat or grease, because everything we grew up with was cooking that way" (40). Another example is, "Participants discussed the difficulties encountered in following prescribed diabetic diets and their fondness for the traditional Mexican diet, which tends to be high in fat and carbohydrates" (180).

Beliefs or attitudes about nopal cactus (V6) – This element describes a perception or attitude towards the food *nopal*, a type of cactus that is commonly consumed in Mexico and United States bordering Mexico and some evidence exists that it aids in improving glycemic control (121). For example, "I buy nopales. And I put them in the Ostarizer with water and I drink the juice and it [blood sugar] goes down like that. *Nopales* are the best thing you can eat when your sugar is high" (228).

4) HEALTH BELIEF ELEMENTS

Values or beliefs (V1) – A value is something that is regarded to have importance, worth or usefulness. In behaviors, this is a person's principles or standards of behavior, judgement of what is important in their life (230). Example, treatment of an elder, grandparent figure and their advice with respect. A belief is the acceptance that a statement is true or something exists or placing confidence in someone or something. Example, "I do yoga because it connects my spirit to the earth and that's important to me."

Worldview (V1) – A worldview is a particular philosophy of life or conception of the world. In many cultures, there is a collective preference or prioritization of beliefs that may influence perceptions about health and illness, but also the role of each individual within a larger society or group. These may include expectations about personal and public behavior, and assumptions on how social interactions should be. Example, a future oriented worldview where a parent or parents are willing to work towards long-term goals so their children may benefit. A present-oriented worldview may be where an immediate appointment may not be as important as the current interaction that is happening, such that a visit with a relative will not be cut short simply to arrive at an appointment on time (233).

Health belief or attitude, general (V1) - A belief (acceptance that a statement is true or something exists; confidence in someone or something) or attitude (a settled way of thinking or feeling about someone or something, typically one that is reflected in a person's behavior) about something or someone that has implications for health or health outcomes (230). If a specific health belief is repeated more than one time, it was added to this protocol and defined.

Health belief or attitude, Herbal Remedies/Complementary and Alternative Medicine (V1) - See health belief or attitude description. This element describes the use of a traditional/home/folk remedies (90). If a non-mainstream practice is used in place of conventional medicine, it is considered "alternative." Examples include *nopales* (prickly pear cactus) and aloe vera for diabetes control (90). For example, "all but one participant discussed the use of traditional folk remedies as an aspect of self-treatment for diabetes" (90).

Health belief or attitude, susto (V1) – Susto is translated as "fright" or "scare" and the sickness that results from a fright event. An even like this is believed to change the bodily state causing a susceptible person to be more vulnerable to the onset of a disease after some unspecified time. For example: "Yes, I got diabetes when a child drowned in front of me, and from that time, I had diabetes. ...I believe that is why I got diabetes, because of that fright. ... Yes, 10 days after the scare I told you about, I had my sugar tested and they found I had diabetes. And because I did not have anything before, then, I say that, in my case, it was the susto that caused my diabetes to develop" (173).

Health belief or attitude, depression (V2) – See health belief or attitude description. "Depression is characterized by depressed or sad mood, diminished interest in activities which used to be pleasurable, weight gain or loss, psychomotor agitation or retardation, fatigue, inappropriate guilt, difficulties concentrating, as well as recurrent thoughts of death. But depression is more than a "bad day"; diagnostic criteria established by the American Psychiatric Association dictate that five or more of the above symptoms must be present for a continuous period of at least two weeks.¹ As an illness, depression falls within the spectrum of affective disorders" (234). An example of this is, "Well, perhaps a person starts to feel very depressed and kind of weak and sick, and then, little by little, diabetes starts to develop in the body" (180).

Alternate treatment (V2) – Treatment administered by persons, rituals or objects not associated with conventional Western medicine and not described by other variables. An example is "Participants in one of the focus groups discussed a barriada in which the healer moves an egg over the asustado/a and then puts it in a glass and breaks it. By examining the egg, the healer can tell what is wrong with the asustado/a. This sweeping is accompanied by prayers" (180). Other examples include rituals performed by a healer using eggs, stones, religious rituals, etc. If a non-mainstream practice is used in place of conventional medicine, it is considered "alternative" (235).

Traditional and western treatment (V2) – The use of a <u>combination</u> of traditional/home/folk remedies in conjunction with conventional treatment by a physician or U.S. healthcare provider (90). These may be described as complementary and alternative medicine (CAM), or integrative medicine. If a non-mainstream practice is used together with conventional medicine, it's considered "complementary." Similarly, integrative health care involves using western and traditional approaches in a coordinated way (235).

Mexican/Hispanic/cultural heritage and cause of T2DM belief (V5) – See health belief or attitude description. This element describes an attitude or belief that Mexican/Hispanic heritage is the, or can cause T2DM. This element was coded for when a belief or attitude related to heritage is attributed to being the, or a cause of T2DM as opposed to other causes such as obesity, poor diet, etc. For example, "One participant stated that Mexicans get diabetes because they do not take care of themselves like Americans do" (173).

Beliefs and attitudes about diabetes medicine/Insulin (V4) - See health belief or attitude description. This variable relates to the patients' beliefs and attitudes regarding the use of (Western) diabetes related medications such as injectables (insulin, byetta, etc.) or pills (metformin/Glucophage, glimiperide, glipizide, Glucotrol, etc.). Example: "Several participants expressed their fear that using insulin might lead to blindness" (173).

Fatalismo/Fatalism (V5) – This element describes a personality trait or a view of the self where it is the belief that one's destiny is out of one's hands (218). For this study, the element of *fatalismo* is in relation toward T2DM and its development/emergence or in the complications that can result from poor diabetes management such as nerve damage, foot damage or amputations, kidney disease/dialysis, loss of vision/blindness, heart disease, and skin disorders. For example, "No matter how much you take care of yourself, that's gonna happen (referring to loss of eyesight, foot problems). I was told it's still gonna happen" (40).

5) VALUES ELEMENTS

Trust, Rapport, Relationship (V1) – Trust or confidence is placed in a person, about their ability and/or relatability. In healthcare, this refers to building credibility as a health care provider with a patient. Rapport is when two individuals or groups understand each other's feelings or ideas and it can lead to a harmonious relationship. In healthcare, this may be

displayed when a healthcare professional expresses concern and understanding of patient's concerns and vice versa (230). A relationship is an established way in which two individuals or groups regard and behave toward each other. In healthcare, a relationship refers to a connection between patient and healthcare professional.

Mistrust and Lack of Rapport (V4) – There is a lack of trust or confidence placed in a person about their ability and/or relatability. From the patient's point of view, the healthcare provider may lack credibility. In healthcare, this may be displayed when a healthcare professional does not express concern and understanding of patient's concerns and vice versa. There is a lack of connection between patient and healthcare professional. "Participants felt that health care providers paid little attention to their disease, and this perceived lack of support made them feel helpless" Hu, 2013).

Marianismo (V6) – This element refers to a traditional female gender role. This element is described in regards to the role of the female in the home and how it may interact with T2DM self-management and self-care. In a negative perception, gender role may function as a risk factor for oppression, but in a positive perception this gender role may also be protective towards the behavior of interest, in this study it would be T2DM self-management or self-care or in relation to a loved one's self-care or self-management (96). For this study, characteristics that can be identified as *marianismo* include, "passivity, lack of agency or voice, lack of employment or career focus, and the bearing of many children" (93).

Machismo (V6) – This element refers to a traditional male gender role. For this study, an individual may be describing their traditional gender role and how it interacts with T2DM self-management and self-care. In some situations, *machismo*, may be negatively perceived "characterized primarily by an attitude of male dominance and entitlement, the abuse of others, the frequent use of profanity, and irresponsibility in meeting social obligations" (96). Another form of another form of *machismo*, on where responsible *machismo* has been described in drug abuse research is proposed to serve as a protective factor against the abuse of alcohol and illicit drugs (96). It can also be "characterized by responsibility in social obligations, and by behavior that provides for the family and that protects the family from harm" (96).

6) COMMUNICATION ELEMENTS

Language preferences (V1) - The patient may have verbal and written language preferences by which they prefer to communicate with the healthcare professional or receive health information (230). Example, "I only use the Spanish recipes because I could not read the ones in English." Note: Language preferences for study purposes (e.g. language of interview) is accounted for in the variable code langofintfoc of the coding protocol.

7) PHYSICAL ACTIVITY ELEMENTS

Physical activity habits (V1) – Habits are regular tendencies or practices, routines, patterns or traditions. For this study, "physical activity is defined as any bodily movement produced by skeletal muscles resulting in energy expenditure" (33). A physical activity habit was recognized as an act that *is happening* currently. For example, "I don't exercise, my work is like

exercising, <u>that's how</u> I keep myself in check" (40). Another example statement is, "Consistently exercising and having a schedule to do it is difficult" (232).

Physical activity preference/avoidance (V1) - A greater liking of one activity over another that requires energy expenditure. For this study, "physical activity is defined as any bodily movement produced by skeletal muscles resulting in energy expenditure" (33). There is a *liking and leaning*, but not necessarily a habit or tendency. For example, "I have an exercise machine and all that, but I don't use it" (40). Another example can be, "I *like* to go walking, but I can't right now because of my knee surgery."

Physical activity beliefs and attitudes (V2) – A belief or attitude regarding physical activity (exercise) that has implications for health or health outcomes. For this study, "physical activity is defined as any bodily movement produced by skeletal muscles resulting in energy expenditure" (33). This element is different from other physical activity elements in that there is an attributed belief towards the activity. For example: "Subjects mentioned other causes generally considered to be part of the biomedical explanation of diabetes, such as poor diet, obesity, heredity and lack of exercise" (180). Another example is, "I don't exercise, my work is like exercising, that's how I keep myself in check" (40).

8) HEALTHCARE SYSTEM ELEMENTS

Healthcare seeking preference/avoidance (V1) – A greater liking towards one alternative over another regarding the healthcare system. This includes preferences for the type of healthcare professional they may prefer to speak with related to their healthcare needs. It may also be in regards to the type of setting (hospital vs. clinic) where they would prefer to seek healthcare. Example, in a study of a 1-year self-management intervention participants preferred to have a bilingual-bicultural health care professional vs. a lay health worker (88). Another example would be "I prefer a health care professional who can understand me in my own language."

Health care support (V5) – The element of health care support is defined as health care provider providing support in processes of self-care and self-management of T2DM. Support can be provided in the form of attention, showing interest and concern for the wellbeing of the patient, and support include a patient-perceived level of approval, comfort, or encouragement from the healthcare provider. A health care provider is anyone that provides health care to a patient such as a physician, nurse, dietitian, therapist, etc. Example: "In this first visit, participants related how their doctors were instrumental in helping them come to terms with their illness and decision to receive treatment…" (181).

Lack of support by health care provider (V5) - The patient explicitly describes lack of support by the health care provider. For this element, a lack of support is defined as the absence of attention, interest, and concern for the wellbeing of the patient by the health care provider. This also can include a patient-perceived level of disapproval, apathy, or discouragement from the health care provider. Health care provider is anyone that provides health care to a patient such as a physician, nurse, dietitian, therapist, etc. For example, "Participants felt that health care providers paid little attention to their disease, and this perceived lack of support made them feel helpless" (232).

9) OTHER ELEMENTS

Practicalities of daily life (V1) - A practicality is a state of being or the aspect of a situation that involves doing/acting on something rather than an idea. Practicalities of daily life may affect self-care or health aspects of an individual. An example may be that since the children get out of school at a certain time, the meal is prepared for them when they arrive and a separate meal was prepared for the husband or wife when they get home from work. "…I forget to take my pills. I would forget to take them at work. So by the time I get off work at 5pm, I have missed the day dose and only have time to take the evening dose" (232).

Personal attributes (V3) – This element refers to the attribution of some kind of a personal trait to health or disease outcomes. This element often attributes an individual's trait to the reason why they have a disease/health, can/cannot control a disease/health. These attributes can then describe an individual's personality such as independent, reliable, impulsive, rude, lazy, etc. One example is, "One subject stated that the development of diabetes depended on a person's temperament" (180). It can also be in regards to physical attributes such as size, height, hair color, clothing/appearance, attractiveness. One example is, "he was "fat and strong" and therefore even experiencing the most frightening episode would not have resulted in his developing diabetes" (180)." It can also be a physiological attribute such as gender, age, health status, posture. One example is, "Years later, when he was in a weakened state, he developed diabetes after an episode of susto" (180).

Non-family Involvement (V4) - This element refers to the patient interacting with nonfamily members, such as friends, co-workers, acquaintances, strangers, in regards to diabetes. The non-family members can influence the patient into making decisions about their own behaviors. This can also include the patient influencing the non-family member's diabetes care. Example: "I saw this lady who was feeling sick... and her daughter told me that her mother had diabetes, but she wouldn't admit that she had it... I tested her blood... and her count was 324, and I told her that was quite high... I started to tell her about all the complications she might have if she did not take care of her diabetes" (173).

Attitudes towards diabetes education (V4) – An attitude is a settled way of thinking or feeling about someone or something, typically one that is reflected in a person's behavior, about something or someone that has implications for health or health outcomes. This element describes an attitude or feeling towards diabetes education, also referred to as diabetes classes. Example: "She felt she did not need to enroll in a diabetes class after her diabetes diagnosis because she believed: "They teach you the same thing [that you hear about everywhere], what [not] to eat..." (228).

Cost (V5) - The element of cost is in regards to a financial challenge being the cause of a patient's inability to access a resource. These resources that are affected by cost are related to different aspects of self-care such as food, medicine, appointment co-pays, late fees/no-show fees, transportation etc. For example, "We want to eat everything and it's difficult, very difficult, especially, because of money. You can't just go and buy vegetables and fruits" (232).

Reliability and Validity Assessment

Reliability Assessment

Coders selected for testing coded the content units under the same conditions to ensure that coders are working independently. They met periodically to discuss disagreements and establish better definitions for variables of interest. Time was limited as to prevent coder fatigue so that each article is provided with similar time, energy and focus to identify these complex cultural elements.

Two measures, which take into account the chance for agreement, were used to report reliability: Cohen's kappa is used for nominal-level data, and Krippendorff's Alpha is used for all levels of data. A minimum value of 0.8 and a >75% percentage of agreement between coders establishes study reliability. These were completed by the researcher.

Validity Assessment

The validity for this study relies on definition provided through peer reviewed literature and other scholarly resources on various aspects of culture. To ensure that the definitions and examples are understood by coders and researchers, the protocol was reviewed by all before and after completion of the final revision. The review of the final protocol is necessary because these definitions were used in a future survey. In addition, a cultural expert reviewed the final cultural elements to ensure that they are defined correctly and have provided adequate examples for coding.

The validity of the cultural elements is based on several bodies of literature (17, 87, 123, 143, 236-239). The definitions presented in this protocol are derived from a review of several studies on the topic of cultural values and beliefs of Mexican-Americans.

Analysis of Data

Cultural Elements

Since the methodology employed is qualitative, for purpose of description only, a scoring method was used for the cultural elements summary. The higher value given, [2], for the cultural elements indicates that there is clear evidence derived from the data presented in the manuscripts reviewed. When the article has been submitted through the completed protocol, summative value of the elements may be calculated. A higher score indicates that more elements were present and/or stronger evidence was presented. Elements found in the study were only counted and assessed with the protocol the first time they were found in the manuscript.

Code Sheet

Cultural Elements

The coder instructions for the cultural elements are:

For each content variable, circle/enter the value that is most representative of the variable as defined in the protocol. If it is not clear if the content fits the variables provided, a new variable was added, defined and given a value. Upon completion of content analysis of each set of articles, a review by both coders was completed to discuss new variables identified. If variables are found in more than one article, these were added to the final protocol. All previous articles assessed with the protocol previously underwent content analysis review for the new variable(s) added to the final protocol.

Protocol Organization

The organization of the Protocol begins with the broadest variables to specific variables. In this protocol, we included the variables for the adapted Critical Appraisal Skills Programme (CASP) qualitative Checklist necessary for other study goals. Therefore, the results section of each article was analyzed at one period of time for the cultural elements and the remaining aspects of the article were analyzed for items in the CASP checklist. See **APPENDIX B: CULTURAL ELEMENTS CODEBOOK** for details.

APPENDIX B: Cultural Elements Codebook

CODING PROTOCOL - VARIABLES, DEFINITIONS AND CODING INSTRUCTIONS

For purposes of brevity, references for the cultural element variables in the coding sheet were removed. These references are found in the coding protocol section of this dissertation **APPENDIX A**.

VARIABLE NAME, Element category and Level category	Variable Description	Coding instructions
ID	Article identification	first author last name + year of publication + first page number in article
source	A source is the name of the journal that is publishing the relevant articles.	 [1] nutrition specific journal – Journals which are focused on publishing nutrition research typically include the word nutrition and/or dietetics in the title. A web search for the journal's "about this journal" section provides explicit information on the topics that are considered for publication in the journal. Examples: Journal of the Academy of Nutrition and Dietetics, Journal of Nutrition Education and Behavior, Journal of Nutrition, Public Health Nutrition etc. [2] diabetes specific journal–Journals which are focused on publishing research related to diabetes topics and may include the word "diabetes" in the title. A web search for the journal's "about this journal" section provides explicit information on the topics that are considered for publication in the journal. Examples: Journal of Diabetes and its Complications, Diabetes Education, Diabetes Care, etc.

Table B.1 Cultural Elements Codebook

[3] public health or healthcare related journal – Journals
which are focused on publishing research related to
public health or general healthcare topics may
include either of these words in the title. A web
search for the journal's "about this journal" section
provides explicit information on the topics that are
considered for publication in the journal. Examples:
American Journal of Public Health, Public Health,
Journal of Health Communication, etc.
[4] social or behavioral sciences journal – Journals
which are focused on publishing research related to
social sciences, sociology, behavioral sciences,
topics may include either of these words in the title.
A web search for the journal's "about this journal"
section provides explicit information on the topics
that are considered for publication in the journal.
Examples: Journal of Immigrant and Minority
Health, Hispanic Journal of Behavioral Sciences,
Journal of Applied Behavioral Sciences, etc.
Note - When a journal has more than one of the
described words in the title, they were categorized
into whichever of these is first. For example, if a
journal is tilted European Journal of Public health
and Diabetes, it was categorized as [2] because
diabetes comes before public health [3]. The
categories are ordered from specific to less specific
topics.

studytype	Type of study	[1] <i>In-depth interview</i> studies use an open-ended, conversation-like method of collecting information from the perspective of the study participants. In- depth interviews typically use a structured or semi-
		 structured interviews typically use a structured of semi-structured interview process that allows the researcher to understand perceptions and how or why perceptions may exist about a certain topic. This approach allows the participant in the study to express their own ideas or priorities (227). [2] <i>Focus group</i> studies involve a small group of individuals sharing what their perspectives, priorities and concerns are about a topic. This approach has an advantage in eliciting a collective point of view or
		understanding of a topic that is inherent in the interactive nature of this method (227).
waarnub	Voor of publication	[3] Both focus groups and in-depth interviews.
valbel	Values or beliefs = A value is something that is	[0] no the element is not present in the study as defined
Health Belief Elements, deep	regarded to have importance, worth or usefulness. In behaviors, this is a person's principles or	[1] yes, the element is present, as defined in the coding protocol
	 standards of behavior, judgement of what is important in their life. Example, treatment of an elder, grandparent figure and their advice with respect. A belief is the acceptance that a statement is true or something exists or placing confidence in someone or something. Example, "I do yoga because it connects my spirit to the earth and that's important to me." Note: values/beliefs vs worldview: If context of statement/sentence is not in relation to other groups, then it is a values/belief. If it is in relation to other is worldview. 	[2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence

Table B.1 (cont'd)

Table B.1 (cont'd)		
worldview	<i>Worldview</i> – A worldview is a particular	[0] no, the element is not present in the study as defined
Health Belief	philosophy of life or conception of the world. In	[1] yes, the element is present, as defined in the coding
Elements, deep	many cultures, there is a collective preference or	protocol
	prioritization of beliefs that may influence	[2] yes, the element is present in the study as defined in
	perceptions about health and illness, but also the	the coding protocol AND a quote or example derived
	role of each individual within a larger society or	from the data is presented as evidence
	group. These may include expectations about	
	personal and public behavior, and assumptions on	
	how social interactions should be. Example, a	
	future oriented worldview where a parent or	
	parents are willing to work towards long-term	
	goals so their children may benefit. A present-	
	oriented worldview may be where an immediate	
	appointment may not be as important as the	
	current interaction that is happening, such that a	
	visit with a relative will not be cut short simply to	
	arrive at an appointment on time. Note: worldview	
	vs values/beliefs: If context of statement/sentence	
	is in relation to other groups, then it is a	
	worldview. If it is not in relation to other groups,	
	then it is values/belief.	
dailyprac, Other	Practicalities of daily life-A practicality is a state	[0] no, the element is not present in the study as defined
Elements,	of being or the aspect of a situation that involves	[1] yes, the element is present, as defined in the coding
surface	doing/acting on something rather than an idea.	protocol
	Practicalities of daily life may affect self-care or	[2] yes, the element is present in the study as defined in
	health aspects of an individual. An example may	the coding protocol AND a quote or example derived
	be forgetting to take the pills due to work	from the data is presented as evidence
	schedule. "I forget to take my pills. I would	
	forget to take them at work. So by the time I get	
	off work at 5pm, I have missed the day dose and	
	only have time to take the evening dose."	

Table B.1 (cont'd)		
familismo Health Belief Elements, deep	<i>Familismo/Familism</i> - A value is defined as the belief that the family is more important than the individual. There is influence on preferences and habits for the entire family such as diet and physical activity. Example: "The whole family eats a salad because of my diabetes."	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Faminvlvmt Health Belief Elements, deep	<i>Family Involvement</i> - This element refers to the patient being influenced by family members into making decisions about their own behaviors. This is different from <i>familismo</i> in that the patient is making the decision for themselves and not for the good of the family. Therefore, there is an attempt to influence behaviors of the individual with diabetes. Example: "My daughter tells me that I shouldn't eat fatty foods and I should go to the gym wither her."	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
foodhab Food belief Elements, surface	Habits are regular tendencies or practices, routines, patterns or traditions. A selection of foods is based, but not limited to, cultural reasons, or because these foods are commonly consumed by the culture. Some food habits are related to cultural practices and cultural norms of an individual. A food habit is recognized as an act that <u>is happening</u> currently. For example, "I know I'm not supposed to eat ice cream every day, but I <u>do it</u> anyway."	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence

Table B.1 (cont'd)		
Foodpref Food Elements, surface	<i>Food preferences</i> - Preference is a greater liking toward one alternative over another. Preferring one food over another based on cultural reasons such as beliefs, familiarity, and norms. There is a <i>liking and leaning</i> , but not a habit or tendency. Example, "What they tell you to eat and, no, no, no, I <i>like</i> my tortillas, I <i>like</i> my bread, I <i>like</i> my hamburgers, I <i>like</i> my doughnuts, I <i>like</i> my fried chicken"	[0] no, the element is not present in the study as defined[1] yes, the element is present, as defined in the coding protocol[2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Healthcarepref Healthcare System Elements, surface	<i>Healthcare seeking preference/avoidance</i> – A greater liking towards one alternative over another regarding the healthcare system. This includes preferences for the type of healthcare professional they may prefer to speak with related to their healthcare needs. It may be in regards to the type of setting (hospital vs. clinic) where they would prefer to seek healthcare. Example, in a study of a 1-year self-management intervention participants preferred to have a bilingual-bicultural health care professional vs. a lay health worker. For example would be "I prefer a health care professional who can understand me in my own language."	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Tradwest Health Belief Elements, surface	The use of a combination of traditional/home/folk remedies in conjunction with conventional treatment by a physician or U.S. healthcare provider. These may be described as complementary and alternative medicine (CAM), or integrative medicine. If a non-mainstream practice is used together with conventional medicine, it's considered "complementary." Similarly, integrative health care involves using western and traditional approaches combined.	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence

Table B.1 (cont'd)		
Trustrap Values Elements, deep	<i>Trust, Rapport, Relationship</i> - Trust or confidence is placed in a person, about their ability and/or relatability. In healthcare this refers to building credibility as a health care provider with a patient. Rapport is when two individuals or groups understand each other's feelings or ideas and it can lead to a harmonious relationship. In healthcare this may be displayed when a healthcare professional expresses concern and understanding of patient's concerns and vice versa. A relationship is an established way in which two individuals or groups regard and behave toward each other. In healthcare a relationship refers to a connection between patient and healthcare	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Nutrknow Food Elements, surface	Acquisition of nutrition knowledge - Acquisition of nutrition knowledge can happen through observation (e.g. a cooking demonstration), formal nutrition education (e.g. a diabetes class with a RDN) or through written informational education handouts (e.g. a food pyramid or portion plate). Example, "Participants who reported that they actively follow a recommended diet learned about healthy food preparation and portion sizes through observation. Manuela had lived with a family of vegetarians (as an employee) and Ofelia had recently spent a week in the hospital; in both cases, each had the opportunity to observe healthy meal portions or preparation."	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence

Table B.1 (cont'd)		
Langpref Communication Elements, surface	Language preferences - The patient may have verbal and written language preferences by which they prefer to communicate with the healthcare professional or receive health information. Example, "I only use the Spanish recipes because I could not read the ones in English." Note: Language preferences for study purposes only is accounted for in the variable langofintfoc.	[0] no, the element is not present in the study as defined[1] yes, the element is present, as defined in the coding protocol[2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Healthbelattit Health belief Elements, deep	Health belief or attitude, general - A belief (acceptance that a statement is true or something exists; confidence in someone or something) or attitude (a settled way of thinking or feeling about someone or something, typically one that is reflected in a person's behavior) about something or someone that has implications for health or health outcomes. <i>If a specific health belief is</i> <i>repeated more than one time, it was added to this</i> <i>protocol and defined.</i>	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Sustobel Health Belief Elements, deep	<i>Health belief or attitude, Susto - Susto</i> is translated as "fright" or "scare" and the sickness that results from a fright event. An even like this is believed to change the bodily state causing a susceptible person to be more vulnerable to the onset of a disease after some unspecified time. For example: "Yes, I got diabetes when a child drowned in front of me, and from that time, I had diabetesI believe that is why I got diabetes, because of that frightYes, 10 days after the scare I told you about, I had my sugar tested and they found I had diabetes. And because I did not have anything before, then, I say that, in my case, it was the <i>susto</i> that caused my diabetes to develop."	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence

Table B.1 (cont'd)		
Herbalcambel,	Health belief or attitude, Herbal/CAM remedies -	[0] no, the element is not present in the study as defined
Health belief	See health belief or attitude description. This	[1] yes, the element is present, as defined in the coding
Elements deep	element describes the use of a	protocol
	traditional/home/folk remedies (90). If a non-	[2] yes, the element is present in the study as defined in
	mainstream practice is used in place of	the coding protocol AND a quote or example derived
	conventional medicine, it is considered	from the data is presented as evidence
	"alternative." Examples include <i>nopales</i> (prickly	
	pear cactus) and aloe vera for diabetes control.	
Teabel	Health belief or attitude, tea - See health belief or	[0] no, the element is not present in the study as defined
Food Elements,	attitude description. A tea is a hot drink made by	[1] yes, the element is present, as defined in the coding
deep	infusing dried or crushed leaves/herbs in boiling	
	or not water. This element describes attributing	[2] yes, the element is present in the study as defined in
	nealth properties or beliefs to a tea. Examples	the coding protocol AND a quote or example derived
	Include Diabelli lea, Huereque lea, werke lea or Malabar taa	from the data is presented as evidence
Donrhalatt	Malabal lea.	[0] no the element is not present in the study of defined
Deproverau Health Daliaf	is characterized by depression – Depression	[1] was the element is present as defined in the adding
Flements deen	diminished interest in activities which used to be	protocol
Liements, deep	nleasurable weight gain or loss nsychomotor	[2] yes, the element is present in the study as defined in
	agitation or retardation, fatigue, inappropriate	the coding protocol AND a quote or example derived
	guilt, difficulties concentrating, as well as	from the data is presented as evidence
	recurrent thoughts of death. But depression is	-
	more than a "bad day"; diagnostic criteria	
	established by the American Psychiatric	
	Association dictate that five or more of the above	
	symptoms must be present for a continuous period	
	of at least two weeks. ¹ As an illness, depression	
	falls within the spectrum of affective disorders.	
	Example: "Well, perhaps a person starts to feel	
	very depressed and kind of weak and sick, and	
	then, little by little, diabetes starts to develop in	
	the body."	

Table B.1 (cont'd)		
Foodbelatt Food Elements, deep	Health belief or attitude, foods general - See health belief or attitude description. See health belief or attitude description. This element describes a health belief or attitude towards food in general. An example of this is, "I told the doctors, I said I don't eat that much kind of sweets. He said, no, it's from generation. Well I don't eat too much sweets, you know I thought it was from sweets you know."	[0] no, the element is not present in the study as defined[1] yes, the element is present, as defined in the coding protocol[2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Alttx Health Belief Elements, deep	Alternate treatment – Treatment administered by persons, rituals or objects not associated with conventional Western medicine and not described by other variables. An example is "Participants in one of the focus groups discussed a barriada in which the healer moves an egg over the asustado/a and then puts it in a glass and breaks it. By examining the egg, the healer can tell what is wrong with the asustado/a. This sweeping is accompanied by prayers." Other examples include rituals performed by a healer using eggs, stones, religious rituals, etc.	 [0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol [2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Foodavoidrel Food Elements, deep	<i>Religious influence on food avoidance</i> The practice of avoiding or withdrawing from a particular food due to a religious influence, belief or ritual. Examples, fasting on Fridays during lent or avoiding red meat. Muslims have rules about meats and if they are prohibited they refer to them as Haaram.	[0] no, the element is not present in the study as defined[1] yes, the element is present, as defined in the coding protocol[2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence

Table B.1 (cont'd)		
Religfoodpref	Religious influence food preferences - Preferring	[0] no, the element is not present in the study as defined
Food Elements,	one food over another based on religious beliefs,	[1] yes, the element is present, as defined in the coding
deep	practices or rituals. Jewish people have rules about	protocol
	the slaughtering of animals and the types of	[2] yes, the element is present in the study as defined in
	animals that are acceptable according to the Torah	the coding protocol AND a quote or example derived
	and these are typically referred to as Kosher	from the data is presented as evidence
	foods. Muslims have rules about meats and if they	
	are permitted they refer to them as Halal.	
Pahabits	Physical activity habits - Habits are regular	[0] no, the element is not present in the study as defined
Physical Activity	tendencies or practices, routines, patterns or	[1] yes, the element is present, as defined in the coding
Elements, surface	traditions. A physical activity habit is recognized	protocol
	as an act that <i>is happening</i> currently. For example,	[2] yes, the element is present in the study as defined in
	"I don't exercise, my work is like exercising,	the coding protocol AND a quote or example derived
	that's how I keep myself in check." Another	from the data is presented as evidence
	example statement is, "Consistently exercising	
	and having a schedule to do it is difficult."	
Paprefavo	<i>Physical activity preference</i> - A greater liking of	[0] no, the element is not present in the study as defined
Physical activity	one activity over another that requires energy	[1] yes, the element is present, as defined in the coding
Elements, surface	expenditure. There is a <i>liking and leaning</i> , but not	protocol
	necessarily a habit or tendency. For example, "I	[2] yes, the element is present in the study as defined in
	don't exercise, my work is like exercising, that's	the coding protocol AND a quote or example derived
	how I keep myself in check. I have an exercise	from the data is presented as evidence
	machine and all that, but I don't use it." Another	
	example can be, "I <u>like</u> to go walking, but I can't	
<u> </u>	right now because of my knee surgery."	
Pabelatt	<i>Physical activity beliefs and attitudes</i> – A belief or	[0] no, the element is not present in the study as defined
Physical activity	attitude regarding physical activity (exercise) that	[1] yes, the element is present, as defined in the coding
Elements, deep	has implications for health or health outcomes.	protocol
	Example: "Subjects mentioned other causes	[2] yes, the element is present in the study as defined in
	generally considered to be part of the biomedical	the coding protocol AND a quote or example derived
	explanation of diabetes, such as poor diet, obesity,	from the data is presented as evidence
	heredity and lack of exercise."	

Table B.1 (cont'd)		
Lacknutrknow Food Element,	<i>Lack of nutrition knowledge</i> - Lack of nutrition knowledge is represented as stating the patient has no formal nutrition education (e.g. never taken a	[0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol
	diabetes class) or as frustration with not knowing what and how much to eat to successfully manage diabetes. Example: "I wish I had a better understanding of diet. Even though I'm a cook that doesn't mean I'm a nutritionist"	[2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Belattmexfood Food Element, deep	<i>Beliefs or attitude about Mexican/cultural foods</i> – This element describes a perception or attitude attributed towards cultural or Mexican foods. Diet	[0] no, the element is not present in the study as defined [1] yes, the element is present, as defined in the coding protocol
	is a key aspect of T2DM self-management and recommendations for dietary behavior change for T2DM especially in regards to cultural foods by Mexican-Americans may be perceived as both a barrier or facilitator. "Like us Hispanics it's hard for us to eat foods that do not contain much fat or grease, because everything we grew up with was cooking that way." Another example is, "Participants discussed the difficulties encountered in following prescribed diabetic diets and their fondness for the traditional Mexican diet, which tends to be high in fat and carbohydrates."	[2] yes, the element is present in the study as defined in the coding protocol AND a quote or example derived from the data is presented as evidence
Qualitative1	1. Does this article report on findings from qualitative research, and did that work involve both qualitative methods of data collection and data analysis?	[0] No [1] Yes [2] Not Clear
Relevant2	2. Is the research relevant to the synthesis topic?	[0] No [1] Yes [2] Not Clear

Table B.1 (cont'd)		
Aims3	3.1 Is there a clear statement of the aims of the	[0] No
	research?	[1] Yes
		[2] Not Clear
Appropriate41	4.1 Is a qualitative method appropriate?	[0] No
		[1] Yes
		[2] Not Clear
Where51	5.1 Is it clear where the sample was selected	[0] No
	from?	[1] Yes
		[2] Not Clear
Why52	5.2 Is it clear why this setting was chosen?	[0] No
		[1] Yes
		[2] Not Clear
Who53	5.3 Is it clear who was selected?	[0] No
		[1] Yes
		[2] Not Clear
Justified54	5.4 Is the sample selection appropriate and	[0] No
	justified?	[1] Yes
		[2] Not Clear
How55	5.5 Is it clear how the sample was selected?	[0] No
		[1] Yes
		[2] Not Clear
Size56	5.6 Is the sample size justified?	[0] No
		[1] Yes
		[2] Not Clear
HowMany57	5.7 Is it clear how many people accepted or	[0] No
	refused to take part in the research?	[1] Yes
		[2] Not Clear
WhyNot58	5.8 Is it clear why some participants chose not to	[0] No
	take part?	[1] Yes
		[2] Not Clear

Table B.1 (cont'd)		
Characteristics59	5.9 Is adequate information given on the	[0] No
	characteristics of the people in the sample?	[1] Yes
		[2] Not Clear
Where 61	6.1 Is it clear where the setting of the data	[0] No
	collection was?	[1] Yes
		[2] Not Clear
WhySetting62	6.2 Is it clear why that setting was chosen?	[0] No
		[1] Yes
		[2] Not Clear
HowExplained63	6.3 Is it clear how the purpose of the research was	[0] No
	explained and presented to the participants?	[1] Yes
		[2] Not Clear
DataCollection64	6.4 Is it clear how the data were collected?	[0] No
		[1] Yes
		[2] Not Clear
DataRecorded65	6.5 Is it clear how the data were recorded?	[0] No
		[1] Yes
		[2] Not Clear
Methods66	6.6 Is it clear whether the methods were modified	[0] No
	during the process, and if so, why?	
		[2] Not Clear
WhoCollected67	6.7 Is it clear who collected the data?	[0] No
		[2] Not Clear
Analysis / I	7.1 Is it clear how the analysis was done?	[0] No
		[2] Not Clear
Categories /2	/.2 Is it clear how the categories/themes were	[U] NO
	derived from the data?	
		[2] Not Clear

Table B.1 (cont'd)

Description73	7.3 Is there adequate description?	[0] No
1	1 1	[1] Yes
		[2] Not Clear
Results74	7.4 Have attempts been made to feed results back	[0] No
	to respondents?	[1] Yes
		[2] Not Clear
Triangulation75	7.5 Have different sources of data about the same	[0] No
	issue been compared where appropriate	[1] Yes
	(triangulation)?	[2] Not Clear
Reliability76	7.6 Was the analysis repeated by more than one	[0] No
-	researcher to ensure reliability?	[1] Yes
	-	[2] Not Clear
Bias81	8.1 Is it clear whether the researchers critically	[0] No
	examined their own role, potential bias, and	[1] Yes
	influence?	[2] Not Clear
Relationship82	8.2 Has the relationship between researchers and	[0] No
	participants been adequately considered?	[1] Yes
		[2] Not Clear
Support91	9.1 Are sufficient data presented to support the	[0] No
	descriptive findings?	[1] Yes
		[2] Not Clear
Quotes92	9.2 Are quotes numbered/identified?	[0] No
		[1] Yes
		[2] Not Clear
DataSample93	9.3 Do the researchers explain how the data	[0] No
	presented in the article were selected from the	[1] Yes
	original sample?	[2] Not Clear
Interpretations94	9.4 Do the researchers indicate links between data	[0] No
	presented and their own interpretations of what	[1] Yes
	the data contain?	[2] Not Clear

Table B.1 (cont'd)		
ContradictoryCases	9.5 Are negative, unusual, or contradictory cases	[0] No
95	presented?	[1] Yes
		[2] Not Clear
Discussion96	9.6 Is there adequate discussion of the evidence	[0] No
	both for and against the researchers'	[1] Yes
	interpretations?	[2] Not Clear
Congruence101	10.1 Is there conceptual and/or theoretical	[0] No
	congruence between this and other work?	[1] Yes
		[2] Not Clear
Transferable102	10.2 Are the findings of this study transferable to	[0] No
	a wider population?	[1] Yes
		[2] Not Clear
Summarizable111	11.1 Is it possible to summarize the findings?	[0] No
		[1] Yes
		[2] Not Clear
FindingsExplicit112	11.2 Were the findings explicit and easy to	[0] No
	understand?	[1] Yes
		[2] Not Clear
TotalScore	Total score (of 36 criteria), sum of items 3.1-11.2	
Aims	What are the aims/purpose of the research?	Enter a short, 1- or 2-word description of the aim(s) of
		the research. Ex: Identify barriers.
Theory	Types/s of methods – theoretical basis	Enter the type of theory the study was based on
		(phenomenology, grounded theory, Health Belief
		Model, etc.)
InExCriteria	Are inclusion and exclusion criteria included?	[0] Not included
		[1] Yes, inclusion only
		[2] Yes, exclusion only
		[3] Yes, both inclusion and exclusion
MeanAge	Age Mean age	Enter mean age of participants
AgeSD	SD	Enter standard deviation of participant age
AgeRange	Range	Enter range of age of participants

Table D.1 (Collt u)	Table	B.1	(cont'd)
---------------------	-------	------------	----------

Gender	What is the gender of the participants?	[0] Does not provide
		[1] All female
		[2] All male
		[3] > 50% female
		[4] > 50% male
		5] 50% female, 50% male
Subjects	Who are the patients/subjects of the study?	[0] Not included
5		1] Patient/Subject
		[2] First degree relatives of patient/subject, only (child,
		parent, sibling)
		[3] Patient/subject AND first degree relative
		[4] Family members (can include first degree relatives,
		spouse, cousins, aunts, etc.)
		[5] Patient/subject and another family member
		[6] Spouse only
		[7] Other
Disease	What disease is the focus of the study?	[0] Not included
	-	[1] Diabetes
		[2] Heart disease
		[3] Depression
		[4] Diabetes + other disease
		[5] Other
Ethnicity	Ethnicity of subjects?	[1] Mexican-American
		[2] Mexican
		[3] Chicano
		[4] Hispanic
		[5] Mixed
EthnicityOther	Other ethnicities included	If [5] Mixed selected above; enter the ethnicities of
		participants
EduLevel	Was the education level included?	[0] no
		[1] yes

Table B.1 (cont'd)		
SocioEco	Was socioeconomic status included?	[0] no
		[1] yes
Setting	What was the setting of the study?	Enter short, $1 - 2$ word, description of study setting. Ex:
		Community clinic
dmcontrol	Does the study provide the glycemic status of the	[0] no
	study participants? i.e. A1C <7%, etc.	[1] yes
A1C	If study provides A1C mean of participants, please	Enter mean A1C number
	write that in	
Langofintfoc	Language used to conduct interview or focus	[0] Not included
	group.	[1] Spanish
		[2] English
		[3] Both Spanish and English
dmclasses	Attendance to diabetes classes by participants	[0] none
		[1] 100%
		[2] >50%
		[3] =50%
		[4] <50%
		[5] info not provided

APPENDIX C: Adapted Critical Appraisal Skills Programme Checklist

AIM 1 – ADAPTED CRITICAL APPRAISAL SKILLS PROGRAMME CHECKLIST

Pro Forma Criteria for Scoring Qualitative Articles	
1. Does this article report on findings from qualitative research, and did that work involve both qualitative methods of data collection and data analysis?	YES/NO
 Is the research relevant to the synthesis topic? Aims 	YES/NO What are they?
Is there a clear statement of the aims of the research? 4. Methods Is a qualitative method appropriate?	Types/s of methods:
5. Sampling	Inclusion and exclusion criteria:
5.1 Is it clear where the sample was selected from?	Characteristics:
5.2 Is it clear why this setting was chosen?	Age: Mean age: SD:
5.3 Is it clear who was selected?	Range:
5.4 Is the sample selection appropriate and justified?	Gender: Women: Men:
5.5 Is it clear how the sample was selected?	Subjects: Patient FDR
5.6 Is the sample size justified?5.7 Is it clear how many people accepted or refused to take part in the research?	Other Other family member
5.8 Is it clear why some participants chose not to take part?	Disease: Cancer HD
 5.9 Is adequate information given on the characteristics of the people in the sample? 6. Data collection 6.1 Is it clear where the setting of the data collection was? 6.2 Is it clear why that setting was chosen? 6.3 Is it clear how the purpose of the research was explained and presented to the participants? 6.4 Is it clear how the data were collected? 6.5 Is it clear how the data were recorded? 6.6 Is it clear whether the methods were modified during the process, and if so, why? 6.7 Is it clear who collected the data? 	Diabetes Ethnicity: Educational level: Socioeconomic status: Describe setting:
 7.1 Is it clear how the analysis was done? 7.2 Is it clear how the categories/themes were derived from the data? 7.2 Is theme adapted equation of the data? 	Outline analysis:

7.3 Is there adequate description?

Pro Forma Criteria for Scoring Qualitative Articles

- 7.4 Have attempts been made to feed results back to respondents?
- 7.5 Have different sources of data about the same issue been compared where appropriate (triangulation)?
- 7.6 Was the analysis repeated by more than one researcher to ensure reliability?
- 8. Research partnership relations
- 8.1 Is it clear whether the researchers critically examined their own role, potential bias, and influence?
- 8.2 Has the relationship between researchers and participants been adequately considered?
- 9. Justification of data interpretation
- 9.1 Are sufficient data presented to support the descriptive findings?
- 9.2 Are quotes numbered/identified?
- 9.3 Do the researchers explain how the data presented in the article were selected from the original sample?
- 9.4 Do the researchers indicate links between data presented and their own interpretations of what the data contain?
- 9.5 Are negative, unusual, or contradictory cases presented?
- 9.6 Is there adequate discussion of the evidence both for and against the researchers' interpretations?
- 10. Transferability
- 10.1 Is there conceptual and/or theoretical congruence between this and other work?
- 10.2 Are the findings of this study transferable to a wider population?
- 11. Findings
- 11.1 Is it possible to summarize the findings?
- 11.2 Were the findings explicit and easy to understand?
- Total score (of 36 criteria)

FDR = first-degree relative; HD = heart disease.

APPENDIX D: Diabetes Counseling and Culture Questionnaire

DIABETES COUNSELING AND CULTURE QUESTIONNAIRE

Diabetes Counseling and Culture Questionnaire

Q1 – CONSENT FORM

Purpose of Research

This study attempts to collect information on how dietitians integrate culture into diabetes counseling with individuals of Mexican heritage.

Procedures

You will be shown statements regarding topics relative to diabetes counseling and will select the level of agreement with these statements. This questionnaire consists of 34 statements relative to diabetes counseling and culture and 55 questions or statements about your professional and personal characteristics. Questions are designed to assess your expert perceptions on cultural scenarios when conducting diabetes counseling in the past year. This survey will take approximately 20-40 minutes to complete. This questionnaire is an on-line Qualtrics-created survey.

Benefits

There are no direct benefits for participants. However, it is hoped that through your participation, researchers will learn more about diabetes counseling and culture.

Risks/Discomforts

Risks are minimal for involvement in this study. However, you may feel emotionally uneasy when asked to make judgments based on the terms or statements provided. Although we do not expect any harm to come upon any participants due to electronic malfunction of the computer, it is possible though extremely rare and uncommon.

Confidentiality

All data obtained from participants will be kept confidential and will only be reported in an aggregate format (by reporting only combined results and never reporting individual ones). All questionnaires will be concealed, and no one other than then primary investigator and research assistant listed below will have access to them. The data collected will be stored in the HIPAA-compliant, Qualtrics-secure database until it has been deleted by the primary investigator.

Participation

Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely without jeopardy. If you desire to withdraw, please close your internet browser.

Compensation

As compensation for your time and expertise, the first 125 participants will receive a \$25 e-gift card from Amazon.com. Additionally, all participants will be entered for a random drawing of two \$50 Amazon Gift Cards.
Questions about the Research

If you have questions regarding this study, you may contact Lorraine Weatherspoon at 517-353-3328, weathe43@msu.edu or Julie Plasencia at 517-353-3337, plasenc4@msu.edu.

Questions about your Rights as Research Participants

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or send regular mail to 408 West Circle Drive, Olds Hall Room 207, MSU, East Lansing, MI 48824.

Q2 I have read, understood, and printed a copy of the above consent form and desire of my own free will to participate in this study.

O Yes (1)
O No (2)
If No Is Selected, Then Skip To End of Survey

Q3 Are you a registered dietitian-nutritionist?
Q Yes (1)
Q No (2)
If No Is Selected, Then Skip To End of Survey

Q4 To the best of your knowledge, have you provided counseling to individuals of Mexican Heritage (e.g. Mexican-Americans, immigrants or individuals of Mexican heritage or descent) on diabetes self-management in the past 12 months?

O Yes (1)

O No (2)

If No Is Selected, Then Skip To End of Survey

Q5 Please indicate your agreement or disagreement with the following statements regarding FAMILY ELEMENTS on diabetes counseling for patients of Mexican heritage. I believe it is important for me to always explain to my clients or patients how...

Strongly Agree (1) Agree (2) Neutral (3) Disagree (4) Strongly Disagree (5) Not sure (6)	(1)	(2)	(3)	(4)	(5)	(6)
taking care of themselves will also benefit their family and their own diabetes. (1)						
a difficult/inconsiderate family member can affect their diabetes. (2)						
family involvement can affect their diabetes. (3)						

Q6 Please indicate your agreement or disagreement with the following statements regarding COMMUNICATION on diabetes counseling for patients of Mexican heritage.

Strongly Agree (1) Agree (2) Neutral (3) Disagree (4) Strongly Disagree (5) Not sure (6)	(1)	(2)	(3)	(4)	(5)	(6)
When I am with a patient who has diabetes, I can easily start a small conversation about any topic. (1)						
I find it difficult to talk to a patient about topics that are not related to their health care. (2)						
I always make sure to find something in common that is not related to diabetes when I meet a new patient. (3)						

Q7 Please indicate your agreement or disagreement with the following statements regarding FEELINGS/BELIEFS on diabetes counseling for patients of Mexican heritage. I believe it is important for me to always explain to my clients or patients how...

Strongly Agree (1) Agree (2) Neutral (3) Disagree (4)						
Strongly Disagree (5)						
Not sure (6)	(1)	(2)	(3)	(4)	(5)	(6)
 depression affects their diabetes. (1) feeling anger affects their diabetes. (2) feeling shame affects diabetes. (4) their beliefs or attitudes about physical activity behaviors affect their diabetes. (5) 						
their gender role in the home affects their diabetes. (3) a fatalistic attitude or belief affects their diabetes. (7)						

Q8 Please indicate your agreement or disagreement with the following statements regarding HEALTH BELIEFS on diabetes counseling for patients of Mexican heritage. I believe it is important for me to always explain to my clients or patients how...

Strongly Agree (1) Agree (2) Neutral (3) Disagree (4) Strongly Disagree (5) Not sure (6)	(1)	(2)	(3)	(4)	(5)	(6)
herbal or folk remedies affect their diabetes. (1) beliefs about medicine or insulin can affect their diabetes.						
(2)						

beliefs about religion can affect their diabetes. (3)			
susto/fright affects their diabetes. (4)			
lack of healthcare provider support affects their diabetes. (5)			
using alternative treatments for their diabetes provided by non-medical/lay healers or curanderos, for example, affects their diabetes. (6)			

Q9 Please indicate your agreement or disagreement with the following statements regarding FOODS on diabetes counseling for patients of Mexican heritage.

I believe it is important for me to always explain to my clients or patients how...

Strongly Agree (1)						
Agree (2)						
Neutral (3)						
Disagree (4)						
Strongly Disagree (5)						
Not sure (6)	(1)	(2)	(3)	(4)	(5)	(6)
beliefs about food can affect their diabetes. (1)						
food/dietary habits can affect their diabetes. (2)						
prior nutrition knowledge can affect their diabetes. (3)						
food preferences or avoidances can affect their diabetes. (4)						
beliefs about teas can affect their diabetes. (5)						
the nopal cactus affects their diabetes. (7)						
Mexican foods can affect their diabetes. (6)						
American foods can affect their diabetes. (8)						

Q10 Please indicate your agreement or disagreement with the following statements regarding diabetes counseling for patients of Mexican heritage.

Strongly Agree (1) Agree (2) Neutral (3) Disagree (4) Strongly Disagree (5) Not sure (6)	(1)	(2)	(3)	(4)	(5)	(6)
I believe it is important for me to discuss with my patients their preferences for specific healthcare professionals they wish to see for their diabetes care (e.g. desired credentials or ethnicity), and if feasible, accommodate this preference. (1)						
I believe it is important for me to discuss with my patients their language of preference for receiving diabetes information, either written or verbal. (2)						
When counseling individuals of Mexican heritage, I find that food preferences vary within these individuals based on their geographical region of origin. (3)						

I seek information on cultural foods that are new to me. (4)						
--	--	--	--	--	--	--

Q11 Please indicate your agreement or disagreement with the following statements regarding diabetes counseling for patients of Mexican heritage.

I have integrated aspects of culture into the diabetes education I provide to my clients or patients based on what I learned...

Strongly Agree (1) Agree (2) Neutral (3) Disagree (4) Strongly Disagree (5) Not sure (6)	(1)	(2)	(3)	(4)	(5)	(6)
through my formal education. (undergraduate and graduate school) (1)						
from cultural competency training. (seminars, workshops, online learning, etc.) (2)						
from patients. (3)						
other source(s). Please specify. (4)						

Q12 For each of the following statements, select the option that best describes how you feel about the statement.

Strongly Agree (1) Agree (2) Somewhat Agree (3) Neutral (4) Somewhat Disagree (5) Disagree (6) Strongly Disagree (7) No opinion (8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Race is the most important factor in determining a person's culture. (1)R								
People with a common cultural background think and act alike. (2)								
Many aspects of culture influence health and health care. (3)								
Aspects of cultural diversity need to be assessed for each individual, group, and organization. (4)								
If I know about a person's culture, I don't need to assess their personal preferences for health services. (5)								

Q13 For each of the following statements, select the option that best describes how you feel about the statement.

Strongly Agree (1) Agree (2) Somewhat Agree (3) Neutral (4) Somewhat Disagree (5) Disagree (6) Strongly Disagree (7) No opinion (8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Spiritually and religious beliefs are important aspects of many cultural groups. (1)								
Individual people may identify with more than one cultural group. (2)								
Language barriers are the only difficulties for recent immigrants to the United Sates. (3)								
I believe that everyone should be treated with respect regardless of their cultural heritage. (4)								
I understand that people from different cultures may define the concept of "health care" in different ways. (5)								

Q14 For each of the following statements, select the option that best describes how you feel about the statement.

about the statement.								
Always (1) Very Often (2) Somewhat Often (3) Often (4) Sometimes (5) Few Times (6) Never (7) Not sure (8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I think that knowing about different cultural groups helps direct my work with individuals, families, groups, and organizations. (1)								
When I do individual or organization evaluations, I include cultural considerations. (2)								
I seek information on cultural needs when I identify new people in my work or school. (3)								
I have resource books and other materials available to help me learn about people from different cultures. (4)								
I use a variety of sources to learn about the cultural heritage of other people. (5)								

Q15 For each of the following statements, select the option that best describes how you feel about the statement.

Always (1) Very Often (2) Somewhat Often (3) Often (4) Sometimes (5) Few Times (6) Never (7) Not sure (8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I ask people to tell me about their own explanations of health and illness. (1)								
I ask people to tell me about their expectations for health services. (2)								
I avoid using generalizations to stereotype groups of people. (3)								
I recognize potential barriers to service that might be encountered by different people. (4)								
I remove obstacles for people of different cultures when I identify barriers to services. (5)								

Q16 For each of the following statements, select the option that best describes how you feel about the statement.

Always (1) Very Often (2) Somewhat Often (3) Often (4) Sometimes (5) Few Times (6) Never (7) Not sure (8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I try to remove obstacles for clients of different cultures when they identify barriers to me. (1)								
I welcome feedback from clients about how I relate to people from different cultures. (2)								
I find ways to adapt my services to individual and group cultural preferences. (3)								
I document cultural assessments if I provide direct client services. (4)								
I document the adaptations I make with clients if I provide direct client services. (5)								

Q17 Read each item below and decide whether the statement is True or False as it pertains to you personally.

	True (1)	False (2)
It is sometimes hard for me to go on with my work if I am not encouraged. (1)		
Sometimes I feel resentful when I do not get my way. (2)		
On a few occasions, I have given up doing something because I thought I was not skilled/able/knowledgeable enough. (3)		
There have been times when I felt like rebelling against people in authority even though I knew they were right. (4)		
No matter who I am talking to, I am always a good listener. (5)		

Q18 Read each item below and decide whether the statement is True or False as it pertains to you personally.

	True (1)	False (2)
There have been occasions when I took advantage of someone. (1)		
I am always willing to admit it when I make a mistake. (2)		
I sometimes try to get even rather than forgive and forget. (3)		
I am always courteous, even to people who are disagreeable. (4)		
I have never been irked when people expressed ideas very different from my own. (5)		

Q19 Read each item below and decide whether the statement is True or False as it pertains to you personally.

	True (1)	False (2)
There have been times when I was quite jealous of the good fortune of others. (1)		
I am sometimes irritated by people who ask favors of me. (2)		
I have never deliberately said something to hurt someone's feelings. (3)		

Q20 How many years have you been a registered dietitian? Slide to select years (1)

Q21 Do you have any of the following certifications or credentials? Select all that apply.

- Certified Diabetes Educator (CDE) (1)
- Board Certified Advanced Diabetes Management (BC-ADM) (2)
- Master's degree (MS, MPH, Med, MBA) (3)
- Registered Nurse (RN, BSN) (4)
- Health Coach Certification (7)
- Other (5) _
- None of the above (6)

Q22 How many years of experience do you have in providing diabetes counseling? (Please provide most approximate number of years.)

Q23 How many patients do you see monthly for diabetes counseling? (Please provide the most approximate number.)

Q24 How many patients do you see monthly for diabetes counseling can you identify as being of Mexican heritage? (Please provide the most approximate number.)

Q25 We would like to assess these cultural elements in curricula used by dietitians. What, if any, curricula do you use in your practice? Select all that apply.

- Stanford Diabetes Self-Management (1)
- Better Choices, Better Health® (2)
- Diabetes Conversation Maps® (3)
- I created my own curriculum (4)
- I adapted an existing curriculum (5)
- I use an employer provided curriculum (6)
- I use a vendor provided curriculum (7)
- Other (Please Specify) (8)
- I do not use a specific curriculum (9)

Q26 Which of the following best describe your place of work? Select all that apply.

- Hospital/Acute care (1)
- Outpatient Clinic, tied to Hospital (2)
- Outpatient clinic, independent of hospital (3)
- Private practice (4)
- Retail (9)
- Rural Setting (5)
- Urban Setting (6)
- Suburban Setting (7)
- Other (Please specify) (8)

Q27 Which of the following age groups are the patients you provide diabetes counseling to? Select all that apply.

- Children (18 years of age and under) (1)
- Adults (ages 18 and over) (2)
- Older adults (ages 65 and over) (3)

Q28 How do you deliver diabetes counseling to your patients? Select all that apply.

- In-person, individually (1)
- In-person, group setting (2)
- Phone (5)
- On-line (3)
- Telehealth (8)
- Other (Please specify) (4)

Q29 Have you participated in cultural competency training?

- Yes (1)
- No (2)

Q30 If you have participated in cultural competency training, please select all those that apply.

- College course for credit (1)
- Content covered in a college course (2)
- Professional Conference or Seminar (3)
- Employer Sponsored Program (4)
- On-line Education (computer assisted) (5)
- Continuing Education Offering (6)
- Other (Please specify) (7)

Q31 What is your age?

Year

Q32 What is your highest level of education completed?

- Bachelor's level (BS, BA, etc.) (1)
- Master's level (MS, MPH, MBA, MA, MEd, MSc, etc. (2)
- Doctoral level (PhD, MD, EdD, DSc, DPH, etc.) (3)

Q33 Where did you complete your basic nutrition and dietetics training?

	United States (1)	Outside of United States (2)
Bachelor's degree (1)		
Dietetic Internship (2)		

Q34 What gender do you identify with?

- Male (1)
- Female (2)
- Transgender woman (3)
- Transgender man (4)
- Prefer not to answer (5)

Q35 What is your ethnic heritage? Check all that apply.

- Black/African American (8)
- Colombian (5)
- Cuban (3)
- Dominican (12)
- Mexican, Mexican American, or Chicano (1)
- Native American/Alaska Native (9)
- Puerto Rican (2)
- Salvadorian (4)
- White/Caucasian/European American (7)
- Other (Please specify) (10)
- Prefer not to answer (11)

Q36 What language(s) do you speak fluently? Check all that apply.

- English (1)
- Spanish (2)
- Portuguese (3)
- French (4)
- Other (please specify) (5)

Q38 Through which of the following groups did you receive the solicitation for this questionnaire?

- Diabetes Care and Education DPG (1)
- Weight Management DPG (2)
- Latinos and Hispanics in Dietetics and Nutrition MIG (3)
- Arizona Academy of Nutrition and Dietetics (9)
- California Academy of Nutrition and Dietetics (4)
- Colorado Academy of Nutrition and Dietetics (6)
- Illinois Academy of Nutrition and Dietetics (7)
- New Mexico Academy of Nutrition and Dietetics (8)
- Texas Academy of Nutrition and Dietetics (5)
- Other (15)

Q37 We thank you for your time spent taking this questionnaire. Please click HERE for more information on your incentive, and return to this window to submit your responses by advancing from this question below.

END OF SURVEY

When clicking "HERE" for Q37, participant gets redirected to the following:

Emails for Incentives

Q1 To receive your \$25 incentive, please provide your preferred email with your selection. If your name is drawn for the Amazon gift card, we will use this email to provide you with further instruction.

amazon.com _____

target.com

Q6 Finally, we thank you for taking the time to complete this survey. We would like to offer you an opportunity to preview the preliminary findings of the study. If you would like to receive this information electronically, please select yes below and provide your preferred email. (Your email will not be shared with any other database and you will receive no further contact from the research team after this project is concluded.)

Yes (please provide email)

No

APPENDIX E: Diabetes Counseling and Culture Questionnaire Code Key

Item	Item	Diabetes Counseling and Culture
Code	Label	
q1	Consent	Q1 Purpose of Research
	form	This study attempts to collect information on how dietitians integrate
		culture into diabetes counseling with individuals of Mexican heritage.
		Procedures
		You will be shown statements regarding topics relative to diabetes
		counseling and will select the level of agreement with these
		statements. This questionnaire consists of 43 questions of statements
		relative to diabetes counseling and culture. Questions are designed to
		assess your expert perceptions on cultural scenarios when conducting
		diabetes counseling in the past year. This questionnaire will take
		approximately 20-40 minutes to complete. This questionnaire is an
		on-line Qualtrics-created survey.
		Benefits
		There are no direct benefits for participants. However, it is hoped that
		through your participation, researchers will learn more about diabetes
		counseling and culture.
		Risks/Discontorts
		feel emotionally uneasy when asked to make judgments based on the
		terms or statements provided. Although we do not expect any harm to
		come upon any participants due to electronic malfunction of the
		computer, it is possible though extremely rare and uncommon.
		Confidentiality
		All data obtained from participants will be kept confidential and will
		only be reported in an aggregate format (by reporting only combined
		results and never reporting individual ones). All questionnaires will be
		concealed, and no one other than then primary investigator and
		research assistant listed below will have access to them. The data
		collected will be stored in the HIPAA-compliant, Qualtrics-secure
		database until it has been deleted by the primary investigator.
		Participation
		the right to withdraw at any time or refuse to participate antiraly
		without jeopardy. If you desire to withdraw, please close your internet
		hrowser
		Compensation
		As compensation for your time and expertise, the first 125 participants
		will receive a \$25 e-gift card from Amazon.com. Additionally, all
		participants will be entered for a random drawing of two \$50 Amazon
		Gift Cards. Questions about the Research

Table E.1 Diabetes Counseling and Culture Questionnaire Code Key

		If you have questions regardi	ng this	s study	, you n	nay con	ntact L	orraine
		Weatherspoon at 517-353-33	28, We		alus alus	.edu oi	r Julie	
		Plasencia at 51/-555-555/, p	a D a	4(w)ms	u.eau. Dominin	anta		
		Questions about your Rights	as kes	b and m		ants	ialeta a	
		If you have questions of cond	terns a	boul ye	our role	e and r	ignis a r offor	s a
		research participant, would in		blam I				mpui,
		or would like to register a co	mpiain	tha Mi	t this st	.uuy, y Stota I	ou ma	y aitar'a
		Human Research Protection	WISH, Drogra	m ot 5	17 255	51210 C	Eav 5	SILY S
		4503 or a mail irb@msu adu	riogia	III at 3	l /-555	-2100, il to 10	Fax J. Ng Was	t Cirolo
		Drive, Olds Hall Room 207,	MSU,	East L	ansing	MI 48	3824	
Q2	consents	Q2 I have read, understood,	and p	rinted a	a copy	of the	above	consent
-	tatus	form and desire of my own f	ree wil	l to par	rticipat	e in thi	is stud	у.
		Yes (1)		-	-		-	
		No (2)						
		If No Is Selected, Then Skip	To En	d of Su	irvey			
Q3	RDstatu	Q3 Are you a registered dieti	tian-ni	utrition	ist?			
	S	Yes (1)						
		No (2)						
		If No Is Selected, Then Skip	To En	d of Su	ırvey			
Q4	MAcoun	Q4 To the best of your know	ledge,	have y	ou pro	vided o	counse	ling to
	seling	individuals of Mexican Herit	age (e.	.g. Mez	kican-A	meric	ans,	
		immigrants or individuals of	Mexic	an heri	itage of	r desce	nt) on	diabetes
		self-management in the past	12 mo	nths?				
		Yes (1)						
		No (2)	— —	1 60				
-05		If No Is Selected, Then Skip	To En	$\frac{d \text{ of } Su}{1}$	irvey	· ·,	1 (1)	11 .
Q5		Q5 Please indicate your agre	ement	or disa	greeme	ent wit	h the f	ollowing
		statements regarding FAMIL	Y ELI	EMEN	15 on 0	labete	s coun	seling
		for patients of Mexican herita	age. I	believe	e it is if	nporta	nt for i	ne to
05.1	familian	always explain to my clients	or pati	ents no)W			
Q5_1	laminsm	A grae (2)						
	0	Agree (2) Noutral (2)						
		Disagree (4)						
		Strongly Disagree (5)						
		Not sure (0)						
		taking care of	(1)	(2)	(3)	(4)	(5)	(0)
		themselves will also	(1)	(2)	(\mathbf{J})	(-)	(\mathbf{J})	(0)
		benefit their family and						
		their own diabetes (1)						
05.2	famturm	a difficult/inconsiderate	(1)	(2)	(3)	(4)	(5)	(0)
×~_ -	oil	family member can affect	(1)	(-)				(~)
		their diabetes. (2)						
		their diabetes. (2)						

Q5_3	faminvol	family involvement can	(1)	(2)	(3)	(4)	(5)	(0)
	vment	affect their diabetes. (3)						
Q6	trust1	Q6 Please indicate your agree	ement o	or disa	greeme	ent with	n the f	ollowing
		statements regarding COMM	UNIC	ATION	I on dia	abetes	counse	eling for
		patients of Mexican heritage.						
Q6_1	trust2	Strongly Agree (1)	(1)	(2)	(3)	(4)	(5)	(0)
		Agree (2)						
		Neutral (3)						
		Disagree (4) Strangly Disagree (5)						
		Not sure (0)						
		When Lam with a nationt	(1)	(2)	(2)	(A)	(5)	(0)
		who has diabetes I can	(1)	(2)	(\mathbf{J})	(4)	(\mathbf{J})	(0)
		easily start a small						
		conversation about any						
		topic (1)						
O6 2	trust3	I find it difficult to talk to a	(1)	(2)	(3)	(4)	(5)	(0)
<u> </u>		patient about topics that are			(-)		(-)	
		not related to their health						
		care. (2)						
Q6_3	MAcoun	I always make sure to find	(1)	(2)	(3)	(4)	(5)	(0)
	seling	something in common that						
		is not related to diabetes						
		when I meet a new patient.						
		(3)						
Q7		Q7 Please indicate your agree	ement o	or disa	greeme	ent with	n the f	ollowing
		statements regarding FEELIN	IGS/BI	ELIEF	S on di	abetes	couns	eling
		for patients of Mexican herita	ige. I b	elieve	1t 1s 1m	iportan	t for n	ne to
07.1	dommogai	always explain to my clients of	or patie	$\frac{\text{ents ho}}{2}$	$\frac{W}{(2)}$	(4)	(5)	(0)
Q/_1	depressi	Agree (2)	(1)	(2)	(3)	(4)	(5)	(0)
	OII	Agree (2) $Noutral (3)$						
		$\frac{1}{2} \frac{1}{2} \frac{1}$						
		Strongly Disagree (5)						
		Not sure (0)						
		depression affects their	(1)	(2)	(3)	(4)	(5)	(0)
		diabetes. (1)	(1)	(-)	(3)	(.)	(0)	(0)
O7 2	anger	feeling anger affects their	(1)	(2)	(3)	(4)	(5)	(0)
× _	U	diabetes. (2)						
Q7 4	genderel	feeling shame affects	(1)	(2)	(3)	(4)	(5)	(0)
	ement	diabetes. (4)						
Q7_5	shame	their beliefs or attitudes	(1)	(2)	(3)	(4)	(5)	(0)
		about physical activity						
		behaviors affect their						
		diabetes. (5)						

Q7_3	pabeliefs	their gender role in the home affects their diabetes.	(1)	(2)	(3)	(4)	(5)	(0)
Q7_7	fatalism	a fatalistic attitude or belief affects their diabetes. (7)	(1)	(2)	(3)	(4)	(5)	(0)
Q8		Q8 Please indicate your agree statements regarding HEALT patients of Mexican heritage. explain to my clients or patient	ement c H BEL I belie nts how	or disag JEFS o ve it is 7	reeme on diab import	nt with etes co cant for	the founsel r me to	ollowing ing for o always
Q8_1	belherba lfolk	Strongly Agree (1) Agree (2) Neutral (3) Disagree (4) Strongly Disagree (5) Not sure (0)	(1)	(2)	(3)	(4)	(5)	(0)
		herbal or folk remedies affect their diabetes. (1)	(1)	(2)	(3)	(4)	(5)	(0)
Q8_2	belmedi nsulin	beliefs about medicine or insulin can affect their diabetes. (2)	(1)	(2)	(3)	(4)	(5)	(0)
Q8_3	belreligi on	beliefs about religion can affect their diabetes. (3)	(1) (2)) (3)) (4)) (5	5) (0)
q8_4	belsusto	susto/fright affects their diabetes. (4)	(1) (2)) (3)) (4)) (5	5) (0)
Q8_5	lacksupp orthcpro f	lack of healthcare provider support affects their diabetes. (5)	(1)	(2)	(3)	(4)	(5)	(0)
Q8_6	belalttx	using alternative treatments for their diabetes provided by non- medical/lay healers or curanderos, for example, affects their diabetes. (6)	(1)	(2)	(3)	(4)	(5)	(0)
Q9		Q9 Please indicate your agree statements regarding FOODS Mexican heritage. I believe it my clients or patients how	on dia is imp	or disag betes c ortant f	ounsel ounsel	nt with ing for to alw	the formation the formation \overline{f} the formation \overline	ollowing nts of plain to

Q9_1	belfoods	Strongly Agree (1) Agree (2) Neutral (3) Disagree (4) Strongly Disagree (5) Not sure (0) beliefs about food can affect their diabetes. (1)	(1) (2) (3) (4	·) (:	5) (0)
Q9_2	belfoodh	food/dietary habits can	(1)	(2)	(3)	(4)	(5)	(0)
	abs	affect their diabetes. (2)						
Q9_3	nutrkno wledge	prior nutrition knowledge can affect their diabetes. (3)	(1)	(2)	(3)	(4)	(5)	(0)
Q9_4	foodpref s	food preferences or avoidances can affect their diabetes. (4)	(1)	(2)	(3)	(4)	(5)	(0)
Q9_5	beltea	beliefs about teas can affect their diabetes. (5)	(1)	(2)	(3)	(4)	(5)	(0)
Q9_7	belmexf oods	the nopal cactus affects their diabetes. (7)	(1)	(2)	(3)	(4)	(5)	(0)
Q9_6	belnopal	Mexican foods can affect their diabetes. (6)	(1)	(2)	(3)	(4)	(5)	(0)
Q9_8	belameri canfoods	American foods can affect their diabetes. (8)	(1)	(2)	(3)	(4)	(5)	(0)
Q10		Q10 Please indicate your ag following statements regard Mexican heritage.	reemei ing dia	nt or di Ibetes c	sagreer ounsel	nent w ing for	ith the patien	ts of
Q10_1	healthca reprefs	Strongly Agree (1) Agree (2) Neutral (3) Disagree (4) Strongly Disagree (5) Not sure (0) I believe it is important for me to discuss with my patients their preferences for specific healthcare professionals they wish to see for their diabetes care (e.g. desired credentials or ethnicity), and if feasible, accommodate this preference. (1)	(1)	(2)	(3)	(4)	(5)	(0)

Table E.1 (cont'd)							
Q10_2	language pref	I believe it is important for me to discuss with my patients their language of preference for receiving diabetes information, either written or verbal. (2)	(1)	(2)	(3)	(4)	(5)	(0)
Q10_3	diffbyre gions	When counseling individuals of Mexican heritage, I find that food preferences vary within these individuals based on their geographical region of origin. (3)	(1)	(2)	(3)	(4)	(5)	(0)
Q10_4	seekinfo newcultf oods	I seek information on cultural foods that are new to me. (4)	(1)	(2)	(3)	(4)	(5)	(0)
Q11	integrate formaled u	Q11 Please indicate your agr following statements regardin Mexican heritage. I have inte education I provide to my cli	eemen ng diat grated ents or	t or dis betes co aspect	agreen ounseli ts of cu	nent wi ng for lture in ed on w	ith the patient to the that I l	ts of diabetes earned
Q11_1	integrate cctrainin g	Strongly Agree (1) Agree (2) Neutral (3) Disagree (4) Strongly Disagree (5) Not sure (0) through my formal education. (undergraduate & graduate school) (1)	(1)	(2)	(3)	(4)	(5)	(0)
Q11_2	integrate frompati ent	from cultural competency training. (seminars, workshops, online learning, etc.) (2)						
Q11_3	integreat efromot hersourc e	from patients. (3)	(1)	(2)	(3)	(4)	(5)	(0)
Q11_4	integrate fromoth ersource text	other source(s). Please specify. (4)	(1)	(2)	(3)	(4)	(5)	(0)
Q12		Q12 For each of the followin describes how you feel about	g state	ments, atemen	select t.	the op	tion th	at best

Q12_1	CCÁ6R	Strongly Agree (1) Agree (2) Somewhat Agree (3) Neutral (4) Somewhat Disagree (5) Disagree (6) Strongly Disagree (7) No opinion (8)								
		Race is the most important factor in determining a person's culture. (1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q12_2	CCA7R	People with a common cultural background think and act alike. (2)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q12_3	CCA8	Many aspects of culture influence health and health care. (3)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q12_4	CCA9	Aspects of cultural diversity need to be assessed for each individual, group, and organization. (4)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q12_5	CCA10 R	If I know about a person's culture, I don't need to assess their personal preferences for health services. (5)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q13		Q13 For each of the follow describes how you feel abo	ving s	tatem e state	ents, s ement	select	the op	ption 1	that be	est
Q13_1	CCA11	Strongly Agree (1) Agree (2) Somewhat Agree (3) Neutral (4) Somewhat Disagree (5) Disagree (6) Strongly Disagree (7) No opinion (8) Spiritually and (1) religious beliefs are	.)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
		important aspects of many cultural groups. (1)								

Table E.1	(cont'd)									
Q13_2	CCA12	Individual people may identify with more than one cultural group. (2)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q13_3	CCA13 R	Language barriers are the only difficulties for recent immigrants to the United Sates. (3)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	0)
Q13_4	CCA14	I believe that everyone should be treated with respect regardless of their cultural heritage. (4)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	0)
Q13_5	CCA15	I understand that people from different cultures may define the concept of "health care" in different ways. (5)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q14		Q14 For each of the foll describes how you feel	lowing about	g stater the sta	ments	, selec	t the o	ption 1	that be	st
Q14_1	CCA16	Always (1) Very Often (2) Somewhat Often (3) Often (4) Sometimes (5) Few Times (6) Never (7) Not sure (0) I think that knowing about different cultural groups helps direct my work with (individuals, families, groups, and organizations. (1)	1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)

Table E.1	(cont'd)									
Q14_2	CCA17	When I do individual or organization evaluations, I include cultural considerations. (2)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q14_3	CCA18	I seek information on cultural needs when I identify new people in my work or school. (3)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q14_4	CCA19	I have resource books and other materials available to help me learn about people from different cultures. (4)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q14_5	CCA20	I use a variety of sources to learn about the cultural heritage of other people. (5)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q15		Q15 For each of the t describes how you fe	follow: el abo	ing sta ut the s	tement stateme	s, seleo ent.	ct the o	option	that be	st
Q15_1	CCA21	Always (1) Very Often (2) Somewhat Often (3) Often (4) Sometimes (5) Few Times (6) Never (7) Not sure (0) I ask people to tell me about their own explanations of health and illness. (1)) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q15_2	CCA22	I ask people to tell me about their expectations for health services. (2)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)

Table E.1	(cont'd)									
Q15_3	CCA23	I avoid using generalizations to stereotype groups of people. (3)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q15_4	CCA24	I recognize potential barriers to service that might be encountered by different people. (4)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q15_5	CCA25	I remove obstacles for people of different cultures when I identify barriers to services. (5)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q16		Q16 For each of the describes how you fe	follow eel abo	ing sta ut the	itemen statem	ts, sele ent.	ect the	option	that be	st
Q16_1	CCA26	Always (1) Very Often (2) Somewhat Often (3) Often (4) Sometimes (5) Few Times (6) Never (7) Not sure (0) I try to remove obstacles for clients of different cultures when they identify barriers to me. (1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q16_2	CCA27	I welcome feedback from clients about how I relate to people from different cultures. (2)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)
Q16_3	CCA28	I find ways to adapt my services to individual and group cultural preferences (3)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(0)

Table E.1	(cont'd)				
Q16_4	CCA29	I document cultural (1) (2) (3) (4) (assessments if I provide direct client services (4)	5) (6)	(7)	(0)
Q16_5	CCA30	I document the (1) (2) (3) (4) adaptations I make with clients if I provide direct	(5) (6)	(7)	(0)
017		client services. (5)	1 4 4	4 ° T	
Q1/		Q1/ Read each item below and decide whether t	ne statem	ient is Tri	le
Q17_1	SD31R	It is sometimes hard for me to go on with	True (1) (1)	False (2)	2)
Q17_2	SD32R	Sometimes I feel resentful when I do not get	(1)	(2)	
Q17_3	SD33R	On a few occasions, I have given up doing something because I thought I was not skilled/able/knowledgeable enough. (3)	(1)	(2)	
Q17_4	SD34R	There have been times when I felt like rebelling against people in authority even though I knew they were right. (4)	(1)	(2)	
Q17_5	SD35	No matter who I am talking to, I am always a good listener. (5)	(1)	(2)	
Q18		Q18 Read each item below and decide whether t or False as it pertains to you personally.	he statem	ent is Tr	le
Q18_1	SD36R		True (1)	False (2)	
		There have been occasions when I took advantage of someone. (1)			
Q18_2	SD37	I am always willing to admit it when I make a mistake. (2)	(1)	(2)	
Q18_3	SD38R	I sometimes try to get even rather than forgive and forget. (3)	(1)	(2)	
Q18_4	SD39	I am always courteous, even to people who are disagreeable. (4)	(1)	(2)	
Q18_5	SD40	I have never been irked when people expressed ideas very different from my own. (5)	(1)	(2)	
Q19		Q19 Read each item below and decide whether t or False as it pertains to you personally.	he statem	ent is Tr	le
Q19_1	SD41R	There have been times when I was quite iealous of the good fortune of others (1)	True (1)	False	(2)

Q19_2	SD42	I am sometimes irritated by people who ask (1) (2) favors of me (2)
Q19_3	SD43	I have never deliberately said something to hurt (1) (2) someone's feelings (3)
020		O20 How many years have you been a registered dietitian?
Q20 1	RDyears	Slide to select years (1)
Q21	y	Q21 Do you have any of the following certifications or credentials?
		Select all that apply.
Q21_1	CDE	Certified Diabetes Educator (CDE) (1)
Q21_2	BCAD	Board Certified Advanced Diabetes Management (BC-ADM) (2)
	М	
Q21_3	masters	Master's degree (MS, MPH, Med, MBA) (3)
_Q21_4	RN	Registered Nurse (RN, BSN) (4)
Q21_7	healthco achcertif ication	Health Coach Certification (7)
Q21 5	othercert	Other (5)
< _	ificaiton	
Q21_6	nootherc	None of the above (6)
	ertificati	
	ons	
Q22	yearsexp	Q22 How many years of experience do you have in providing diabetes
	erience	counseling? (Please provide most approximate number of years.)
Q23	patients	Q23 How many patients do you see monthly for diabetes counseling?
	monthly	(Please provide the most approximate number.)
Q24	mapatie	Q24 How many patients do you see monthly for diabetes counseling
	hly	most approximate number)
025	Шу	O25 We would like to assess these cultural elements in curricula used
Q_{23}		by dietitians What if any curricula do you use in your practice?
		Select all that apply
O25 1	stanford	Stanford Diabetes Self-Management (1)
Q25_2	betterch oices	Better Choices, Better Health® (2)
025 3	conversa	Diabetes Conversation Maps® (3)
X	tionmap	
	S	
Q25 4	createdo	I created my own curricula (4)
	wn	
Q25_5	adaptede xisiting	I adapted an existing curriculum (5)
Q25_6	employe rprovide d	I use an employer provided curricula (6)

Table E.1	(cont'd)

Table Lif (cont u)	
Q25_7	vendorpr ovided	I use a vendor provided curricula (7)
Q25_8	othercur riculum	Other (Please Specify) (8)
Q25_9	nocurric ulumuse d	I do not use a specific curriculum (9)
Q26		Q26 Which of the following best describe your place of work? Select all that apply.
Q26_1	hospitala cutecare	Hospital/Acute care (1)
Q26_2	outpatie nthospit alclinic	Outpatient Clinic, tied to Hospital (2)
Q26_3	outpatie ntclinic	Outpatient clinic, independent of hospital (3)
Q26_4	privatepr actice	Private practice (4)
Q26_9	rural	Retail (9)
Q26_5	urban	Rural Setting (5)
Q26_6	suburba n	Urban Setting (6)
Q26_7	othersett ing	Suburban Setting (7)
Q26_8	retail	Other (Please specify) (8)
Q27		Q27 Which of the following age groups are the patients you provide diabetes counseling to? Select all that apply.
Q27_1	ptsarechi ldren	Children (18 years of age and under) (1)
Q27_2	ptsaread ults	Adults (ages 18 and over) (2)
Q27_3	ptsareol deradult s	Older adults (ages 65 and over) (3)
Q28		Q28 How do you deliver diabetes counseling to your patients? Select all that apply.
Q28_1	individu aldeliver y	In-person, individually (1)
Q28_2	groupdel ivery	In-person, group setting (2)
Q28_5	onlinede livery	Phone (5)
Q28_3	otherdeli very	On-line (3)

I HOIT DII (
Q28_8	telehealt h	Telehealth (8)
Q28_4	phonede livery	Other (Please specify) (4)
Q29		Q29 Have you participated in cultural competency training?
Q29_1	cctrainin g yes	Yes (1)
Q29_2	cctrainin g no	No (2)
Q30		Q30 If you have participated in cultural competency training, please select all those that apply.
Q30_1	cccolleg ecoursec redit	College course for credit (1)
Q30_2	cccolleg ecoursec ontent	Content covered in a college course (2)
Q30_3	ccprofes sionalco nference	Professional Conference or Seminar (3)
Q30_4	ccemplo yerprogr am	Employer Sponsored Program (4)
Q30_5	cconline educatio n	On-line Education (computer assisted) (5)
Q30_6	cccontin uingedu cation	Continuing Education Offering (6)
Q30_7	ccother	Other (Please specify) (7)
Q31		Q31 What is your age?
Q31_1	age	Year (1)
Q32		Q32 What is your highest level of education completed?
Q32_1	higheste ducompl eted Bachelor	Bachelor's level (BS, BA, etc.) (1)
Q32_2	higheste ducompl eted Masters	Master's level (MS, MPH, MBA, MA, MEd, MSc, etc. (2)

	cont u)	
Q32_3	higheste ducompl eted	Doctoral level (PhD, MD, EdD, DSc, DPH, etc.) (3)
	Doctoral	
Q33		Q33 Where did you complete your basic nutrition and dietetics training?
Q33 1	Badieteti	United States Outside of United States
~ _	cstrainin	(1) (2)
	g	Bachelor's degree
	-	(1)
Q33_2	dietetici	Dietetic Internship
	nternshi	(2)
	ptraining	
Q34	gender	Q34 What gender do you identify with? Male (1) Female (2)
		Transgender woman (3) Transgender man (4) Preter not to answer (5)
<u>Q35</u>		Q35 What is your ethnic heritage? Check all that apply.
Q35_8	ethniche	Black/African American (8)
	ritageAf	
	rAm	
Q35_5	ethniche	Colombian (5)
	ritageCo	
025.2	lombian	
Q35_3	ethniche	Cuban (3)
	ritageCu	
025 12	Dan	Dominican (12)
$\frac{Q35}{025}$ 12	athriaha	Dominican (12) Mayiaan Mayiaan Amariaan ar Chiaana (1)
Q35_1	ritageMe xAm	Mexican, Mexican American, of Chicano (1)
O35 9	ethniche	Native American/Alaska Native (9)
× _	ritageA	
	mInd	
Q35 2	ethniche	Puerto Rican (2)
<u> </u>	ritagePR	
Q35_4	ethniche	Salvadorian (4)
	ritageSal	
	vadorea	
	n	
Q35_7	ethniche	White/Caucasian/European American (7)
	rıtageCa	
	ucasian	
Q35_10	ethniche	Other (Please specify) (10)
	ritageoth	
	e	

	ont uj	
Q35_11	Ethniche ritageno	Prefer not to answer (11)
	answer	
Q36		Q36 What language(s) do you speak fluently? Check all that apply.
Q36_1	englishla nguage	English (1)
Q36_2	spanishl anguage	Spanish (2)
Q36_3	portugue selangua ge	Portuguese (3)
Q36_4	frenchla nguage	French (4)
Q36_5	otherlan guage	Other (please specify) (5)
Q38		Q38 Through which of the following groups did you receive the solicitation for this questionnaire?
Q38_1	DCE DPG	Diabetes Care and Education DPG (1)
Q38_2	WM DPG	Weight Management DPG (2)
Q38_3	LAHID AN MIG	Latinos and Hispanics in Dietetics and Nutrition MIG (3)
Q38_9	ARIZO NA	Arizona Academy of Nutrition and Dietetics (9)
Q38_4	CALIFO RNIA	California Academy of Nutrition and Dietetics (4)
Q38_6	COLOR ADO	Colorado Academy of Nutrition and Dietetics (6)
Q38_7	ILLINO IS	Illinois Academy of Nutrition and Dietetics (7)
Q38_8	NEW MEXIC O	New Mexico Academy of Nutrition and Dietetics (8)
Q38_5	TEXAS	Texas Academy of Nutrition and Dietetics (5)
Q38_15	OTHER	Other (15)
Q37	Incentiv e link	Q37 We thank you for your time spent taking this questionnaire. Please click HERE for more information on your incentive, and return to this window to submit your responses by advancing from this question below.

APPENDIX F: Michigan State University Institutional Review Board Letter of Approval

IRB Application Determination

MI	CHIGAN STATE
UΝ	IVERSITY
May 1	9, 2016
To:	Lorraine Weatherspoon 334 Trout FSHN Bldg MSU
Re:	IRB# x16-677e Category: Exempt 2 Approval Date: May 19, 2016

Diabetes Counseling and Culture

Initial IRB Application Determination *Exempt*

The Institutional Review Board has completed their review of your project. I am pleased to advise you that your project has been deemed as exempt in accordance with federal regulations.

The IRB has found that your research project meets the criteria for exempt status and the criteria for the protection of human subjects in exempt research. Under our exempt policy the Principal Investigator assumes the responsibilities for the protection of human subjects in this project as outlined in the assurance letter and exempt educational material. The IRB office has received your signed assurance for exempt research. A copy of this signed agreement is appended for your information and records.

Renewals: Exempt protocols do <u>not</u> need to be renewed. If the project is completed, please submit an Application for Permanent Closure.

Revisions: Exempt protocols do <u>not</u> require revisions. However, if changes are made to a protocol that may no longer meet the exempt criteria, a new initial application will be required.

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 and change the category of review, notify the IRB office promptly. Any complaints from participants regarding the risk and benefits of the project must be reported to the IRB.



Office of Regulatory Affairs Human Research Protection Programs

Biomedical & Health Institutional Review Board (BIRB)

Community Research Institutional Review Board (CRIRB)

Social Science Behavioral/Education Institutional Review Board (SIRB)

Olds Hall 408 West Circle Drive, #207 East Lansing, MI 48824 (517) 355-2180 Fax: (517) 432-4503 Email: irb@msu.edu www.hrpp.msu.edu

MSU is an affirmative-action, equal-opportunity employer. Follow-up: If your exempt project is not completed and closed after <u>three years</u>, the IRB office will contact you regarding the status of the project and to verify that no changes have occurred that may affect exempt status.

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 IRB@msu.edu. Thank you for your cooperation.

Sincerely,

Title:

A. M. See

Harry McGee, MPH SIRB Chair

c: Julie Plasencia

APPENDIX G: Content Analysis Coding Protocol, Study 3

CURRICULA CULTURAL ELEMENTS CONTENT ANALYSIS CODING PROTOCOL, V5

Introduction

The aim of this study is to determine the extent to which T2DM self-management intervention curricula utilized in research incorporate culture-specific diet and physical activity elements for Mexican-Americans. The objective is to compare and describe surface and deep level culture-specific elements related to nutrition, physical activity and other lifestyle factors in T2DM interventions targeting Mexican-American adults. These cultural elements can be examined by surface and deep levels, and by the type of communication transaction in which they may be expected to occur (professional-patient or patient-family) to further understand how T2DM self-management behaviors are influenced by cultural values and beliefs.

Landmark studies on diabetes self-management (4, 5) (162) have paved the way for developing self-management interventions targeting ethnic populations who are disproportionately affected by T2DM, such as Mexican-Americans and African-Americans. Some randomized control trials examining the outcomes of culturally tailored self-management interventions have also been completed, and these trials have shown improved diabetes control and outcomes (97, 102, 163). However, there is still a lack of standard criteria for what cultural tailoring entails making it difficult to develop recommendations on how to develop such self-management interventions (164).

Theoretical Model

This research is framed around Resnicow's model for cultural sensitivity in public health (17). Resnicow et. al. developed a framework to categorize the components of culturally sensitive health interventions whose goals are to change health behaviors or target populations (17). This approach distinguishes elements of culture in surface level and deep level constructs. Elements that fit in surface level include language preference, channel of information delivery, settings where intervention and recruitment for intervention occur, and preferences for the ethnicity, gender, age and language of delivery agent (110). Elements that make up deep level include social support and social support networks (11, 14-16), including family members and utilizing the cultural belief on familismo, (92, 110) literacy levels (110) and a variety of other cultural beliefs on health and foods (122). Many of the cultural elements that are categorized as deep structure are not often described in quantitative studies that evaluate outcomes of interventions. Often, studies of qualitative nature corresponding to interventions are more likely to identify themes that fit into the deep structure level.

Conceptual Definitions of Cultural Elements for Content Analysis

Drawing from Resnicow's model for cultural sensitivity in public health, elements of culture that influence behavior change can be categorized as two types: Surface Level and Deep Level (17). In this coding protocol, conceptual definitions derive from several sources of

literature relative to T2DM self-management. The fields of study on this topic range from medical to social sciences due to increase interest in behavioral aspects of T2DM self-management, and the focus in this study is relative to Mexican-Americans. The references for the definitions used in this protocol can be found in the full text of this dissertation proposal (Section 3.1 -Approach for Aim 1).

"Surface level" reflects the cultural elements that include food preferences. It is well known that culture largely influences lifestyle behaviors including food choices (76, 119, 120). Food preferences can include things like tortillas, beans, nopales (prickly cactus), and chayote (prickly pear cactus). The food preferences under surface level do not have significance beyond preference. If a food preference is identified and there is an associated belief about the food, such as having curative or health-properties, this food would fall into the deep level elements.

Other surface level elements include the following examples. A particular *setting* is often chosen specifically to recruit targeted participants or conduct the research, intervention or education because it is convenient for or frequently used by the targeted participants (110). Setting is considered a surface level element.

The delivery method for diabetes interventions can also influence the success of individual's T2DM self-management success. A review of intervention features targeting disadvantaged populations showed that one-on-one interventions were not only more successful in achieving improvements in self-management but participation and retention in the intervention also tend to be higher (118).

Language refers to the means of communication between individuals. This element includes a preference for one's native language over English when speaking, consuming media and interacting socially (119).

Some of these elements are supported by other intervention literature to be typical components of what is often referred to as cultural tailoring. One example is the use of community educators (e.g. paraprofessionals, lay health workers, *promotoras*) that are bilingual and bicultural (117, 118).

"Deep level," on the other hand, relates to elements such as social support and social support networks (11, 14-16), including family members and utilizing the cultural belief on *familismo*, (92, 110) literacy levels (110) and a variety of other cultural beliefs on health and foods (122). Many of the cultural elements that are categorized as deep level were not often described in quantitative studies that evaluate outcomes of interventions. Often, studies of qualitative nature corresponding to interventions are more likely to identify themes that fit into the deep level.

Familismo is defined as the belief that the family is more important than the individual (91, 123). This notion can extend beyond one's own family and extend to people who also have responsibility or provide care for an individual such as a doctor, nurse or clinic staff person. The belief that foods have certain healing properties also falls into this deep level element of culture. For example, many Mexican-Americans believe that *nopales*, a common food in the Mexican

diet, contain properties that help with T2DM (87). Other beliefs may include foods such as tea (122).

Both levels of cultural elements may be described in different types of studies related to T2DM self-management. However, content analysis of qualitative studies that focus on the perceptions of Mexican-Americans with T2DM were used to specify and define some of these cultural elements.

Research Design

Content analysis was conducted to explore characteristics of T2DM self-management intervention curricula targeting Mexican-Americans. Cultural characteristics of interest include two broad categories of cultural elements, surface and deep level (as defined in **Content Variable Operational Definitions**).

Sampling and content universe

The sample of T2DM self-management intervention curricula was obtained by several methods. First, leaders in research positions at three professional organizations (American Association of Diabetes Educators, American Diabetes Association, and Academy of Nutrition and Dietetics) were contacted to ask for leads on existing interventions targeting Mexican-American adults where participants may have completed the self-management interventions and outcome data is may be available. Second, a list of completed self-management interventions was generated using a key word search of T2DM self-management interventions targeting Mexican-American adults published in peer review journals and in ProQuest theses and dissertations published since the year 2000. Additionally, citations of these research studies were reviewed for additional studies that fit the self-management intervention curriculum criteria (defined in Conceptual Definitions). Once a comprehensive list is generated, authors or principal investigators, and/or centers where self-management interventions were/are occurring were contacted via email, with a follow-up by email or phone (if available) one week after first contact. Up to four attempts were made to obtain curriculum and any leads were followed up each week, by email and/or phone.

Inclusion Criteria

The following characteristics were used as inclusion criteria of intervention curricula. A T2DM self-management intervention curricula targeting Mexican-Americans includes the following characteristics:

- Objectives related to changes in behavior specific to diet and physical activity for T2DM self-management
- A statement that the intervention is developed or adapted for Hispanic communities, specifically Mexican-Americans or
 - The curriculum should be developed or adapted for Hispanic community that is primarily Mexican-American

- When no explicit statement related to target population is available, the intervention was included if the subject ethnic demographics indicate majority (>50%) of participants in the intervention were of Mexican-American ethnicity
- If neither of these criteria are reported, attempts to reach the author(s) was made regarding the ethnic makeup of the study participants

The most commonly used marker of T2DM management is glycosylated hemoglobin (A1C). It indicates average glucose levels of the prior three months (47). This marker is commonly utilized by physicians to diagnose, monitor, and make medication adjustments in patients with type 1 and T2DM (18). In this study, the focus is T2DM, the more common type of diabetes among all Americans and Mexican-Americans, and because it is a diet-related disease, often preceded by overweight/obesity (18). Thus, a variable of interest was change in A1C level as published in corresponding results of intervention outcomes.

When available, other dependent variables that can be used to assess the outcomes of the self-management intervention included change in body mass index (BMI), changes in dietary behavior and diet composition, and changes in participation in physical activity. Diet recommendations typically include limiting intake of calories, fat, sugar and/or carbohydrates or intake of foods high in solid fats, alcohol, and added sugar and looking for increases in intake of fruits and vegetables, therefore, these dietary behaviors are of interest due to their association with glycemic control (165). Similarly, increase in physical activity behaviors includes participation in physical activity in types of activities, amount of time or number of days engaging in activities (165).

Independent variables of interest included the two broad categories, surface and deep level cultural elements. These variables were assessed by frequency of appearance in curricula. The surface level cultural elements were selected based on the literature. Surface level cultural elements were included using broad definitions and any new or more specific elements that were identified were added during coder meetings. Some examples of these surface level cultural elements are below. New elements that emerge were added during coder trainings. New elements that were defined were added during coder meetings per coding protocol.

- Language(s): The languages the curricula are available in to provide the intervention, English, Spanish, or both.
- Familiar foods: The curriculum explicitly provides examples of foods that are common among Mexican-Americans as reported in the literature (i.e. *nopales, tortillas*, etc.).
- Visuals: Visuals recommended or provided in the curriculum that are not foods. These may include *foto-novelas* (picture/cartoon style story books), photographs of what would appear to be Mexican-American people, people participating in folkloric dancing, etc.
- Peer-delivery: The curriculum indicates that the program should be delivered by a peer of the participants, implying that these individuals be of the same ethnicity as the participants. These peer participants are not trained professionals, but are supervised or guided by trained professionals such as physicians, nurses or registered dietitians.

• Bilingual Professionals: The curriculum indicates that the program should be delivered by a bilingual professional with training. These trained professionals include but are not limited to be physicians, nurses or registered dietitians.

Deep level cultural elements included the broad categories described below, and as new elements emerge, were added during the coder trainings.

- Family: The curriculum should explicitly state that there is participation of family in the program, for example suggesting that a family member attend the self-management intervention with the participant or requests for at-home participation through dialogue with the participant.
- Health beliefs: The curriculum should explicitly include dialogue regarding health beliefs with participants.
 - Alternately, dialogue regarding specific health beliefs such as *susto/fright, curandero/traditional healer, etc.* be included.

Additional surface and deep level cultural elements added to the coding protocol if the elements appeared at least two times and do not fit under definitions of existing variables. Other independent variables regarding the characteristics of the curriculum were included are number of lessons/sessions per intervention total; recommended time for completion; other self-management topics addressed such as eye care, foot care, medication adherence, self-monitoring with blood glucose meter, problem solving (treatments for acute hypo and hyperglycemia events), recommendations regarding participation in physical activity and recommendations regarding diet.

Coder Training

Coding was conducted independently by two trained, research assistants. The primary researcher trained the coders, and met at least five times to review coding protocol, make changes to definitions and make changes to content analysis coding protocol. At the first meeting, coders reviewed coding protocol and receive reading assignments regarding Mexican-American populations to become familiar with the culture. The research assistants coded one curriculum independently and in the second meeting research and research assistants reviewed and clarified the definitions that remain unclear in the protocol. At each subsequent meeting, discrepancies between coders were discussed and clarified. Initially, coders will code curricula until a 0.8 kappa on agreement is reached, and the codebook no longer needs revisions. All curricula, a total of 6, will be coded individually by coders.

Data Collection

This protocol describes a systematic procedure and definitions for applying these descriptions of cultural elements which aim to assess how these are reported in the literature. Because these concepts are not typically described in all individual qualitative research studies on the topic, it is necessary to explore multiple qualitative focus group and in-depth interview studies. Content analysis of studies not utilizing qualitative research methods do not provide the depth of Mexican-American perceptions, therefore, quantitative studies are not included in this research.

Content Universe:

Curricula:

A curriculum is defined as a facilitator's guide that may include participant handouts with a goal of providing lifestyle change recommendations for T2DM self-management that are backed by science (<u>http://www.cdc.gov/diabetes/prevention/lifestyle-program/curriculum.html</u>). Curricula typically have learning and/or behavioral goals and objectives.

Cultural element:

A cultural element is a concept that is reported in the research study of interest to have an effect or influence on behaviors. Because this study's criteria is specific to Mexican-Americans, elements identified in the research may be specific or general elements that influence behaviors for T2DM self-management. Although culture can be defined as, "integrated patterns of behavior, including thoughts, verbal and nonverbal language, actions, customs, beliefs, values, and institutions of racial, ethnic religious or social groups" (111), we are specifically interested in examining culture from an ethnic heritage perspective. Therefore, in this study, cultural elements are defined as symbols, language, values and norms that are common or shared among individuals to influence actions such as dietary or physical activity behaviors.

Data Processing Procedures

Accessing/Storing Content

Access and storage of curricula was completed through the Michigan State University Libraries' relevant databases for scholarly work. The curricula were downloaded and saved to a network folder and backed up to a Michigan State University cloud storage to increase accessibility by the researchers.

Processing/Preparing of Content

The curricula were saved either in pdf, word or html formats. The following procedure applies for measuring cultural elements.

- 1. Text were examined using reading of lines of curriculum and coding according to the **Content Variable Operational Definitions**
- 2. Each line/sentence was examined for cultural elements and marked, either through annotated method in the text or by referencing the pages, paragraph number and sentence number in a separate word document.
- 3. In the case of compound sentences with more than one concept addressed, each different concept was coded as one sentence.
- 4. Coders did not code gestational diabetes information.

Coder Preparation

Coder Selection

Familiarity with Mexican-American culture is necessary to clearly identify elements reported in the research curricula selected for the study. If the coder is not familiar with the concepts of culture, the coders were provided with literature (6, 17) in addition to the first version of this protocol that provided fundamental information and was discussed with primary research prior to commencement of coding. This should suffice for acquisition of basic background knowledge on Mexican-American culture.

The actual coding, requires only that coders recognize text describing elements in the curriculum as defined in the section, **Content Variable Operational Definitions**. Elements that not initially defined were added by research when identified by coders when appearing in more than one curriculum.

Coder Training

Coder training proceeds in the following steps:

- 1. The protocol was read-through by at least two coders.
- 2. Coders collectively discussed and applied the protocol to examples.
- 3. Coders applied the protocol individually to sample curricula.
- 4. Coding comparisons of sample curricula was discussed and disagreements in coding were clarified.
- 5. Modification of the coding protocol and/or examples were completed in an iterative process. This allowed the addition of cultural elements that have not appeared in previous curricula.
- 6. These steps are repeated until high inter-rater reliability levels were reached. If after discussing discrepancies between coders, inter-rater reliability of the item was low, it was not included for interpretation of findings.

Although the above training steps apply to the "practice" period, and is best undertaken with material not in the sample of content for the study, only one sample curriculum was used as practice. In addition, since this exploratory study seeks to identify and define cultural elements, new cultural elements were added to the study per protocol. Study supervisor conducted reliability testing for the study to ensure that new and modified coding was applied to earlier curricula not coded for the new cultural elements.

Coding Procedures

Coding decisions for the cultural elements described below are intended to be relatively simple, once the conceptual and operational definitions are grasped by coders. The practical limitations on coding in this study may arise from the complexity of some of the definitions, especially as new cultural elements are identified from the curricula.

If variables are as simple as the identifying cultural elements, coders can work for several hours a day with brief breaks. In some cases, coders met to compare new cultural elements identified and discussed how these were defined. The total time for this coding project was approximately 50 hours including meetings to discuss the coding.

Content Variable Operational Definitions

The following operational definitions were applied to the curricula and relied on the coders ability to identify these throughout the content as defined.

Type of Curricula

The type of curriculum was categorized as follows:

[1] Facilitator's guide (this may include a lesson plan or tutorial directed to healthcare provider) that includes participant handouts (a handout that provides information directed to participant)

[2] Facilitator's guide without additional handouts/written information for participants

[3] Handout(s)/written information for participant, no instruction provided to facilitator on how to provide or guide the participant on using the information provided

[4] Other: Specify [If a type of curricula as described here appears more than one time, an additional code was added to encompass the newly defined type of curricula.]

Published/Copyright dates

Fill in a year as a four-digit value indicated on the curriculum.

Facilitator Instructions

1. Does the curriculum provide the reader/facilitator with general instructions on how to use the material?

[0] No

[1] Yes

2. Does the curriculum provide the reader/facilitator with instructions on how to adapt or change the material for specific population/ethnicity/culture?

[0] No

[1] Yes

3. Does the curriculum provide the reader/facilitator with materials for the patient/client receiving the information?

[0] No

[1] Yes

3a. If yes to previous answer, does the curriculum provide the reader/facilitator with instruction on using the materials with the patient/client?

[0] No

[1] Yes
4. Does the curriculum specify its intended target audience (i.e. patient, patient and family member, etc.)?

[0] Not specified

[1] Yes:

5. Does the curriculum provide objectives for the whole curriculum or each lesson/module?

[0] no objectives provided

[1] only objective for entire curriculum

[2] only objectives for each lesson/module

[3] objectives for both, entire curriculum and for each lesson/module

6. Does the curriculum provide objectives related to physical activity?

[0] no physical activity objectives provided

[1] only physical activity objective for entire curriculum

[2] only physical activity objectives for each lesson/module

[3] physical activity objectives for both, entire curriculum and for each lesson/module

7. Does the curriculum provide objectives related to nutrition and/or eating behaviors?

[0] no nutrition and/or eating behavior objectives provided

[1] only nutrition and/or eating behaviors objective for entire curriculum

[2] only nutrition and/or eating behaviors objectives for each lesson/module

[3] nutrition and/or eating behaviors objectives for both, entire curriculum and for each lesson/module

8. Does the curriculum provide objectives related to glucose self-monitoring behaviors?

[0] no glucose self-monitoring objectives provided

[1] only glucose self-monitoring behavior objectives for entire curriculum

[2] only glucose self-monitoring behavior objectives for each lesson/module

[3] glucose self-monitoring behaviors objectives for both, entire curriculum and for each lesson/module

9. Does the curriculum provide instruction on evaluation of the objectives or goals to the reader/facilitator?

[0] no instruction is provided to reader/facilitator on evaluation

[1] yes, instruction is provided to reader/facilitator on one evaluation of entire curriculum

[2] yes, instruction is provided to reader/facilitator on evaluation of the overall lesson/module in the curriculum

[3] yes, instruction is provided to reader/facilitator on evaluation of each objective for the lessons/modules in the curriculum

Literacy level

How technical is the material? Copy and paste the first sentence, last sentence and a sentence in the middle of the curriculum (intended to be used by the healthcare professional) to the following website: <u>http://www.online-utility.org/english/readability_test_and_improve.jsp</u>. The amount of text must be at least 100 words.

- Please provide the following scores:
- Coleman Liau Index:
- Flesch Kincaid Grade level:_____

- ARI (Automated Readability Index):
- SMOG:
- Flesh Reading Ease: ____

How technical is the material/handout intended for patient? Copy and paste the first sentence, last sentence and a sentence in the middle of the handout or information intended to be used by the patient/client) to the following website: <u>http://www.online-utility.org/english/readability_test_and_improve.jsp</u>. The amount of text must be at least 100 words.

Please provide the following scores:

- Coleman Liau Index:
- Flesch Kincaid Grade level:
- ARI (Automated Readability Index):
- SMOG: ____
- Flesh Reading Ease: ____

Observable features of curriculum

Does the curriculum contain images?

[0] No

[1] Yes, black and white

[2] Yes, color

[3] Yes, black/white and color

Does the content contain cartoons or photographs?

[0] No

- [1] Yes, cartoons
- [2] Yes, photographs (real life/not cartoon images)
- [3] Yes, cartoons and photographs (cartoon and real life images)

Is the image content relative to T2DM self-management/the material content? Ex. Does it show someone checking their glucose, or handling medicine or participating in the described activity? Or does the material have an Easter bunny/Christmas tree included just because that is the current season? (random vs. intentional) Is it generalizable to other science materials? Then consider them not relevant and we can live without them.

- [0] No images
- [1] Yes, relative content
- [2] No, image content is not relative
- [3] Yes & No, both relevant and not relevant content are included

Cultural Elements Assessment

Each curriculum is assessed for all of the following cultural elements and given a rating from 0-2 as follows:

A [0] indicates that no, the element is not present in the study as defined. A [1] indicates that yes, the element is present, through either description or definition in the study as defined in the coding protocol.

A [2] indicates that the element is present in the study through either description or as defined in the coding protocol AND there is a recommendation/instruction on how the healthcare professional should address the cultural element, or an action that can be performed by the healthcare professional. The action, recommendation or instruction should be directed at the facilitator.

Cultural Elements

I. FAMILY

Influence of familismo on health-related behaviors - This value is defined as the belief that the family is more important than the individual (91, 92). This element can extend beyond one's own family to people who also have responsibility or provide care for an individual such as a doctor, nurse or clinic staff person. Important decisions are made for the family benefit versus the individual making the decision (80). For example, "Ofelia was aware that she could improve and maintain the health and well-being of her family members, and herself, by controlling food intake" (228).

Family influence – This element refers to the patient being influenced by family members into making decisions about their own behaviors. It can also be described how family may have influenced to perform or not perform behaviors related to diabetes management, or treat themselves with regards to diabetes management. This is different from *familismo, in that* the decisions are made for the good of the whole family. Therefore, there is an attempt to influence behaviors of the individual with diabetes. Example: "My daughter tells me that I shouldn't eat fatty foods and I should go to the gym wither her" (229).

Family turmoil – This element refers to family involvement that has a negative effect on mental or physical health. A type of disturbance, confusion or uncertainty may be described and attributed to a family member(s) or caused by a family member(s) which is subsequently attributed to resulting in a negative outcome such as eating poorly, not being active, getting sick, etc. For example, "She doesn't know what she's talking about and that's the way the whole family speaks to me in a condescending way and it makes me want to eat what's in front of me even more" (229).

Shame regarding diabetes – This element represents the patient's feelings regarding a diabetes diagnosis or self-management aspects (nutrition, medicine, physical activity, etc.), and sharing these with others. In some cases, it was discussed as part of adhering to self-management practices in front of others. Example: "I was so ashamed. I was ashamed that people might learn I was sick. I thought if I did not say anything about it, I was ok" (180).

III. HEALTH BELIEFS

Healthcare seeking preference/avoidance – A greater liking towards one alternative over another regarding the healthcare system. This includes preferences for the type of healthcare

professional they may prefer to speak with related to their healthcare needs. It may also be in regards to the type of setting (hospital vs. clinic) where they would prefer to seek healthcare. Example, in a study of a 1-year self-management intervention participants preferred to have a bilingual-bicultural health care professional vs. a lay health worker (88). Another example would be "I prefer a health care professional who can understand me in my own language."

Health belief or attitude, general - A belief (acceptance that a statement is true or something exists; confidence in someone or something) or attitude (a settled way of thinking or feeling about someone or something, typically one that is reflected in a person's behavior) about something or someone that has implications for health or health outcomes (230). *If a specific health belief is repeated more than one time, it was added to this protocol and defined.*

Health belief or attitude about diabetes in general - A belief or attitude about diabetes as a disease which has implications for health or health outcomes. This element refers to beliefs related to diabetes, without being specific on the aspect of diabetes.

Health belief or attitude, susto – *Susto* is translated as "fright" or "scare" and the sickness that results from a fright event. An even like this is believed to change the bodily state causing a susceptible person to be more vulnerable to the onset of a disease after some unspecified time. For example: "Yes, I got diabetes when a child drowned in front of me, and from that time, I had diabetes. ...I believe that is why I got diabetes, because of that fright. . . . Yes, 10 days after the scare I told you about, I had my sugar tested and they found I had diabetes. And because I did not have anything before, then, I say that, in my case, it was the *susto* that caused my diabetes to develop" (173).

Health belief or attitude, Herbal/folk remedies - See health belief or attitude description. This element describes the use of a traditional/home/folk remedies (90). For example, "all but one participant discussed the use of traditional folk remedies as an aspect of self-treatment for diabetes" (90).

Health belief/attitude related to tea - See health belief or attitude description. A tea can be a hot drink made by infusing dried or crushed leaves/herbs in boiling or hot water. This element describes attributing health properties or beliefs to a tea. Examples include Diabetil tea, Huereque tea, Werke tea or Malabar tea (90).

Religious influence on food avoidance - The practice of avoiding or withdrawing from a particular food due to a religious influence, belief or ritual. Examples, fasting on Fridays during lent or avoiding red meat. Muslims have rules about meats and if they are prohibited they refer to them as Haaram. (230)

Religion-related food preferences - Preferring one food over another based on religious beliefs, practices or rituals. Jewish people have rules about the slaughtering of animals and the types of animals that are acceptable according to the Torah and these are typically referred to as Kosher foods. Muslims have rules about meats and if they are permitted they refer to them as Halal (230).

Traditional and western treatment – The use of a <u>combination</u> of traditional/home/folk remedies in conjunction with conventional treatment by a physician or U.S. healthcare provider

(90). These may be described as complementary and alternative medicine (CAM), or integrative medicine. If a non-mainstream practice is used together with conventional medicine, it's considered "complementary." Similarly, integrative health care involves using western and traditional approaches in a coordinated way (235).

Health belief or attitude, depression – See health belief or attitude description. "Depression is characterized by depressed or sad mood, diminished interest in activities which used to be pleasurable, weight gain or loss, psychomotor agitation or retardation, fatigue, inappropriate guilt, difficulties concentrating, as well as recurrent thoughts of death. But depression is more than a "bad day"; diagnostic criteria established by the American Psychiatric Association dictate that five or more of the above symptoms must be present for a continuous period of at least two weeks.¹ As an illness, depression falls within the spectrum of affective disorders" (234). This element is a belief or attitude that relates depression to diabetes. An example of this is, "Well, perhaps a person starts to feel very depressed and kind of weak and sick, and then, little by little, diabetes starts to develop in the body" (180).

Alternate treatment – Treatment administered by persons, rituals or objects not associated with conventional Western medicine and not described by other variables. An example is "Participants in one of the focus groups discussed a barriada in which the healer moves an egg over the asustado/a and then puts it in a glass and breaks it. By examining the egg, the healer can tell what is wrong with the asustado/a. This sweeping is accompanied by prayers" (180). Other examples include rituals performed by a healer using eggs, stones, religious rituals, etc. If a non-mainstream practice is used in place of conventional medicine, it is considered "alternative" (235).

Beliefs and attitudes about diabetes medicine/Insulin - See health belief or attitude description. This variable relates to the patients' beliefs and attitudes regarding the use of (Western) diabetes related medications like injectables (insulin, byetta, etc.) or pills (metformin/Glucophage, glimiperide, glipizide, Glucotrol, etc.). Example: "Several participants expressed their fear that using insulin might lead to blindness" (173).

Mexican/Hispanic/cultural heritage and cause of T2DM belief – See health belief or attitude description. This element describes an attitude or belief that Mexican/Hispanic heritage is the, or can cause T2DM. This element was coded for when a belief or attitude related to heritage is attributed to being the, or a cause of T2DM as opposed to other causes such as obesity, poor diet, etc. For example, "One participant stated that Mexicans get diabetes because they do not take care of themselves like Americans do" (173).

Fatalismo/Fatalism – This element describes a personality trait or a view of the self where it is the belief that one's destiny is out of one's hands (218). For this study, the element of *fatalismo* is in relation toward T2DM and its development/emergence or in the complications that can result from poor diabetes management such as nerve damage, foot damage or amputations, kidney disease/dialysis, loss of vision/blindness, heart disease, and skin disorders. For example, "No matter how much you take care of yourself, that's gonna happen (referring to loss of eyesight, foot problems). I was told it's still gonna happen" (40)

IV.VALUES

Trust, Rapport, Relationship – Trust or confidence is placed in a person, about their ability and/or relatability. In healthcare this refers to building credibility as a health care provider with a patient. Rapport is when two individuals or groups understand each other's feelings or ideas and it can lead to a harmonious relationship. In healthcare this may be displayed when a healthcare professional expresses concern and understanding of patient's concerns and vice versa (230). A relationship is an established way in which two individuals or groups regard and behave toward each other. In healthcare a relationship refers to a connection between patient and healthcare professional.

Mistrust and Lack of Rapport – There is a lack of trust or confidence placed in a person about their ability and/or relatability. From the patient's point of view, the healthcare provider may lack credibility. In healthcare this may be displayed when a healthcare professional does not express concern and understanding of patient's concerns and vice versa. There is a lack of connection between patient and healthcare professional. *"Participants felt that health care providers paid little attention to their disease, and this perceived lack of support made them feel helpless" (232).*

Machismo – This element refers to a traditional male gender role. For this study, an individual may be describing their traditional gender role and how it interacts with T2DM selfmanagement and self-care. In some situations, *machismo* may be negatively perceived "characterized primarily by an attitude of male dominance and entitlement, the abuse of others, the frequent use of profanity, and irresponsibility in meeting social obligations" (96). Another form of another form of *machismo*, on where responsible *machismo* has been described in drug abuse research is proposed to serve as a protective factor against the abuse of alcohol and illicit drugs (96). It can also be "characterized by responsibility in social obligations, and by behavior that provides for the family and that protects the family from harm" (96).

Marianismo – This element refers to a traditional female gender role. This element can be described in regards to the role of the female in the home and how it may interact with T2DM self-management and self-care. In a negative perception, gender role may function as a risk factor for oppression, but in a positive perception this gender role may also be protective towards the behavior of interest, in this study it would be T2DM self-management or self-care or in relation to a loved one's self-care or self-management (96).

V. FOOD BELIEFS

Food habits – Habits are regular tendencies or practices, routines, patterns or traditions. A selection of foods can be based, but are not limited to, cultural reasons, or because these foods are commonly consumed by the culture. Some food habits are related to cultural practices and cultural norms of an individual (40). A food habit is recognized as an act that is happening currently. For example, "To eat right, [the doctor] gives me a thing that I can follow. Sometimes I follow it, and sometimes I don't, you know? When it's the holidays, you don't follow anything" (228).

Food preferences/avoidances – Preference is a greater liking toward one alternative over another. Preferring one food over another based on cultural reasons such as beliefs, familiarity, and norms. There is a <u>liking and leaning</u>, but not necessarily a habit or tendency. Example, "What they tell you to eat and, no, no, no, I <u>like</u> my tortillas, I <u>like</u> my bread, I <u>like</u> my hamburgers, I <u>like</u> my doughnuts, I <u>like</u> my fried chicken…" (40).

Acquisition/use of nutrition knowledge – Acquisition of nutrition knowledge can happen through observation (e.g. a cooking demonstration), formal nutrition education (e.g. a diabetes class with a registered dietitian) or through written informational education handouts (e.g. a food pyramid or portion plate) (228). Example, "Participants who reported that they actively follow a recommended diet learned about healthy food preparation and portion sizes through observation. Manuela had lived with a family of vegetarians (as an employee) and Ofelia had recently spent a week in the hospital; in both cases, each had the opportunity to observe healthy meal portions or preparation" (228).

Health belief or attitude, foods general - See health belief or attitude description. This element describes a health belief or attitude towards food in general. An example of this is, "I told the doctors, I said I don't eat that much kind of sweets. He said, no, it's from generation. Well I don't eat too much sweets, you know I thought it was from sweets you know" (231).

Lack of Nutrition Knowledge – Lack of nutrition knowledge can be represented as stating the patient has no formal nutrition education (e.g. never taken a diabetes class) or as frustration with not knowing what and how much to eat to successfully manage diabetes. Example: "I wish I had a better understanding of diet. Even though I'm a cook that doesn't mean I'm a nutritionist" (232).

Beliefs or attitude about Mexican/cultural foods – This element describes a perception or attitude attributed towards cultural or Mexican foods. Diet is a key aspect of T2DM selfmanagement and recommendations for dietary behavior change for T2DM especially in regards to cultural foods by Mexican-Americans may be perceived as both a barrier or facilitator (12). "Like us Hispanics it's hard for us to eat foods that do not contain much fat or grease, because everything we grew up with was cooking that way" (40). Another example is, "Participants discussed the difficulties encountered in following prescribed diabetic diets and their fondness for the traditional Mexican diet, which tends to be high in fat and carbohydrates" (180).

VI. PHYSICAL ACTIVITY BELIEFS

Physical activity habits – Habits are regular tendencies or practices, routines, patterns or traditions. For this study, "physical activity is defined as any bodily movement produced by skeletal muscles resulting in energy expenditure" (33). A physical activity habit is recognized as an act that *is happening* currently. For example, "I don't exercise, my work is like exercising" (40).

Physical activity preference/avoidance - A greater liking of one activity over another that requires energy expenditure. For this study, "physical activity is defined as any bodily movement produced by skeletal muscles resulting in energy expenditure" (33). There is a *liking and*

leaning, but not necessarily a habit or tendency. For example, "I have an exercise machine and all that, but I don't use it" (40).

Physical activity beliefs and attitudes – A belief or attitude regarding physical activity (exercise) that has implications for health or health outcomes. For this study, "physical activity is defined as any bodily movement produced by skeletal muscles resulting in energy expenditure" (33). This element is different from other physical activity elements in that there is an attributed belief towards the activity. For example: "Subjects mentioned other causes generally considered to be part of the biomedical explanation of diabetes, such as poor diet, obesity, heredity and lack of exercise" (180). Another example is, "I don't exercise, my work is like exercising, that's how I keep myself in check" (40).

VII. COMMUNICATION

Language considerations - The healthcare professional may face language considerations of the patient. The patient may have verbal and written language preferences by which they prefer to communicate with the healthcare professional or receive health information (230). Example, "I only use the Spanish recipes because I could not read the ones in English." For example, the patient may have verbal and written language needs which prevent them from communicating effectively with healthcare professionals. The patient may also have preferences for the language in which they prefer to communicate or receive healthcare information. Example, "Communicating is hard. My son translates. They should provide this services" (182). *Note: Language preferences for study purposes (e.g. language of interview) is accounted for in the variable langofintfoc of the coding protocol.*

VIII. SUPPORT

Non-family influences - This element refers to the patient interacting with non-family members, such as friends, co-workers, acquaintances, strangers, in regards to diabetes. The non-family members can influence the patient into making decisions about their own behaviors. This can also include the patient influencing the non-family member's diabetes care. Example: "I saw this lady who was feeling sick... and her daughter told me that her mother had diabetes, but she wouldn't admit that she had it... I tested her blood... and her count was 324, and I told her that was quite high... I started to tell her about all the complications she might have if she did not take care of her diabetes" (173).

Health care support – The element of health care support is defined as health care provider providing support in processes of self-care and self-management of T2DM. Support can be provided in the form of attention, showing interest and concern for the wellbeing of the patient, and support include a patient-perceived level of approval, comfort, or encouragement from the healthcare provider. A health care provider is anyone that provides health care to a patient such as a physician, nurse, dietitian, therapist, etc. Example: "In this first visit, participants related how their doctors were instrumental in helping them come to terms with their illness and decision to receive treatment..." (181).

Non-specific support - The element of non-specific support is defined as a general recommendation to provide support in processes of self-care and self-management of T2DM.

Support can be provided in the form of attention, showing interest and concern for the wellbeing of the patient, and support include a patient-perceived level of approval, comfort, or encouragement from the healthcare provider. Example: "Find someone who will help you keep track of and reach your T2DM self-management goals."

Lack of support by health care provider - The patient explicitly describes lack of support by the health care provider. For this element, a lack of support is defined as the absence of attention, interest, and concern for the wellbeing of the patient by the health care provider. This also can include a patient-perceived level of disapproval, apathy, or discouragement from the health care provider. Health care provider is anyone that provides health care to a patient such as a physician, nurse, dietitian, therapist, etc. For example, "Participants felt that health care providers paid little attention to their disease, and this perceived lack of support made them feel helpless" (232).

IX. RESOURCES

Cost - The element of cost is in regards to a financial challenge being the cause of a patient's inability to access a resource. These resources that can be affected by cost are related to different aspects of self-care such as food, medicine, appointment co-pays, late fees/no-show fees, transportation etc. For example, "We want to eat everything and it's difficult, very difficult, especially, because of money. You can't just go and buy vegetables and fruits" (232).

Food access (v4) - This element is relative to having access to foods or finding food. "Accessibility to sources of healthy food, as measured by distance to a store or by the number of stores in an area. Individual-level resources that may affect accessibility, such as family income or vehicle availability. Neighborhood-level indicators of resources, such as the average income of the neighborhood and the availability of public transportation." Economic research services of the USDA. Example, "I am unable to buy food."

Reliability and Validity Assessment

Reliability and validity assessment were undertaken for this study's primary independent variables defined above. These are described as follows.

Reliability Assessment

Coders selected for testing coded the content units under the same conditions to ensure that coders are working independently. They met periodically to discuss disagreements and establish better definitions for variables of interest. Time was limited as to prevent coder fatigue so that each curriculum is provided with similar time, energy and focus to identify these complex cultural elements.

Two measures, which take into account the chance for agreement, were used to report reliability: Cohen's kappa is used for nominal-level data, and Krippendorff's Alpha can be used for all levels of data. A minimum value of 0.8 and a >75% percentage of agreement between coders establishes study reliability.

Validity Assessment

The validity for this study relies on definition provided through peer reviewed literature and other scholarly resources on various aspects of culture. To ensure that the definitions and examples are understood by coders and researchers, the protocol was reviewed by all before and after completion of the final revision. In addition, a cultural expert reviewed the final cultural elements to ensure that they are defined correctly and have provided adequate examples for coding.

The validity of the cultural elements are based on several bodies of literature (17, 87, 123, 142, 236-239). The definitions presented in this protocol are derived from a review of several studies on the topic of cultural values and beliefs of Mexican-Americans.

Analysis of Data

Cultural Elements

This study is a qualitative study. For purpose of description only, a scoring method was used for the cultural elements summary. The higher value given, [2], for the cultural elements indicates that there is clear evidence derived from the data presented in the curricula reviewed. When the curricula were submitted through the completed coding protocol, summative value of the elements may be calculated. A higher score indicates that more elements were present and/or stronger evidence was presented. Elements found in the study were counted and assessed with the protocol the first time they were found in the manuscript to prevent duplication of scores.

Code Sheet

Cultural Elements

The coder instructions for the cultural elements are:

For each content variable, circle/enter the value that is most representative of the variable as defined in the protocol. If it is not clear if the content fits the variables provided, a new variable was added, defined and given a value. Upon completion of content analysis of each set of curricula, a review by both coders was completed to discuss new variables identified. If variables are found in more than one curricula, these were added to the final protocol. All previous curricula assessed with the protocol previously underwent content analysis review for the new variable(s) added to the final protocol.

Protocol Organization

The organization of the Protocol began with the most complex variables to simplest variables. In this protocol, we included the variables for the adapted Critical Appraisal Skills Programme (CASP) qualitative Checklist necessary for other study goals. Therefore, the results section of the curricula were analyzed at one period of time for the cultural elements and the remaining aspects of the curricula were analyzed for items in the CASP checklist.

APPENDIX H: Content Analysis Codebook, Study 3

CODEING SCHEME

Content Analysis Diabetes Curricula

Q26 Coder initials:

Q1 Title of Curricula (Author, year, acronym of title):

Q2 Type of curricula:

- Facilitator's guide that includes participant handouts (1)
- Facilitator's guide without participant handouts (2)
- Handout(s)/written information for participant, no further instructions for facilitator (3)
- Other (specify) (4)

Q3 Published/Copyright Year

Q27 This curriculum is written in:

- English (1)
- Spanish (2)
- English and Spanish (3)

Q28 How many pages is this curriculum?

Q4 Does the material provide the reader/facilitator with general instructions on how to use the material?

• No (1)

• Yes (2)

Q29 Does the curriculum state who should provide the lesson? (i.e. Nurse, Dietitian, Community Health Worker, etc.)

- Yes (1)
- No (3)

Q33 Are there brand logos in the curriculum?

- Yes (1)
- No (2)

Q30 Does the curriculum state who it was developed for?

- Yes, Hispanics (1)
- Yes, Mexican Americans (2)
- Yes, Other (3)
- No (4)

Q5 Does the curriculum provide the reader/facilitator with instructions on how to adapt or change the material for specific population/ethnicity/culture?

- Yes (1)
- No (2)

Q6 Does the curriculum provide the reader/facilitator with materials for the patient/client receiving the information?

- Yes (1)
- No (2)

Q7 If yes to the previous question, does the curriculum provide the reader/facilitator with instructions on using the material with the patient/client?

- Yes (1)
- No (2)
- N/A, No to the previous question (3)

Q8 Does the curriculum specify its intended target audience (i.e. patient, patient and family member, etc.)?

- Yes (1) _
- Not specified (2)

Q9 Does the curriculum provide objectives for the whole curriculum or each lesson/module?

- No objectives provided (1)
- Only objectives for entire curriculum (2)
- Only objectives for each lesson/module (3)
- Objectives for both entire curriculum and each lesson/module (4)

Q32 How many lessons does the curriculum have?

- Q31 How many topics do individual lessons cover?
 - One per lesson (1)
 - More than one per lesson (2)

Q10 Does the curriculum provide objectives related to physical activity?

- No physical activity objectives (1)
- Only physical activity objectives for the entire curriculum (2)
- Only physical activity objectives for each lesson/module (3)
- Physical activity objectives for both entire curriculum and each lesson/module (4)

Q11 Does the curriculum provide objectives related to nutrition and/or eating behaviors?

- No nutrition and/or eating behavior objectives (1)
- Only nutrition and/or eating behavior objectives for entire curriculum (2)
- Only nutrition and/or eating behavior objectives for each lesson/module (3)
- Nutrition and/or eating behavior objectives for both entire curriculum and each lesson/module (4)

Q12 Does the curriculum provide objectives related to glucose self-monitoring behaviors?

- No glucose self-monitoring objectives (1)
- Only glucose self-monitoring objectives for entire curriculum (2)
- Only glucose self-monitoring objectives for each lesson/module (3)
- Glucose self-monitoring objectives for both entire curriculum and each lesson/module (4)

Q13 Does the curriculum provide instructions on evaluation of the objectives or goals to the reader/facilitator?

- No instruction is provided to the reader/facilitator (1)
- Yes, instruction is provided to the reader/facilitator on one evaluation of the entire curriculum (2)
- Yes, instruction is provided to the reader/facilitator on evaluation of the overall lesson/module in the curriculum (3)
- Yes, instruction is provided to the reader/facilitator on evaluation of each objective for the lessons/modules in the curriculum (4)

Q14 How technical is the material? Copy and paste the first sentence, last sentence and a sentence in the middle of the curriculum to the following website: http://www.online-utility.org/english/readability_test_and_improve.jsp (must be at least 100 words) Provide the following scores:

- Coleman Liau Index (1)
- Flesch Kincaid Grade Level (2)
- ARI (Automated Readability Index) (3)
- SMOG (4)
- Flesh Reading Ease (5)

Q15 How technical is the material handout intended for the patient?

- Coleman Liau Index (1)
- Flesch Kincaid Grade Level (2)
- ARI (Automated Readability Index) (3)
- SMOG (4)
- Flesh Reading Ease (5)

Q16 Does the curriculum contain images?

- No (1)
- Yes, black and white (2)
- Yes, color (3)
- Yes, black/white and color (4)

Q17 Does the content contain cartoons or photographs?

- No (1)
- Yes, cartoons (2)
- Yes, photographs (real life/ not cartoons) (3)
- Yes, cartoons and photographs (real life/ not cartoons) (4)

Q18 Is the image content relative to diabetes self-management/the material content? Ex. Does it show someone checking their glucose, or handling medicine or participating in the described activity? Or does the material have an Easter bunny/Christmas tree included just because that is the current season? (random vs. intentional)

- No images (1)
- Yes, relevant content (2)
- No, image content is not relevant (3)

• Yes & No, both relevant and not relevant content are included (4)

Q19 FAMILY

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not Sure/ Discuss (4)	(0)	(1)	(2)	(4)
Influence of familismo on health-related behaviors (4)				
Family Influence (5)				
Family Turmoil (6)				
Shame regarding diabetes (7)				
Page and Paragraph for Discussion (8)				

Q20 HEALTH BELIEFS

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not Sure/ Discuss (4)	(0)	(1)	(2)	(4)
Healthcare seeking preference/avoidance (1)				
Health belief or attitude, general (2)				
Health belief or attitude about diabetes in general (3)				
Health belief or attitude, susto (4)				
Health belief or attitude, Herbal/Folk remedies (5)				
Health belief or attitude related to tea (6)				
Religious influence of food avoidance (7)				
Religion-related food preference (8)				
Traditional and Western treatment (9)				
Health belief or attitude, depression (not explicit sadness) (10)				
Alternative treatment (11)				
Belief or attitude about diabetes medicine/insulin (12)				
Mexican/cultural heritage and cause of T2DM belief (13)				
Fatalismo/Fatalism (14)				
Trust, Rapport, Relationship (15)				
Mistrust and Lack of Rapport (16)				
Machismo (17)				
Marianismo (18)				
Page and Paragraph for Discussion (20)				

Q34 FEELINGS

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not Sure/ Discuss (4)	(0)	(1)	(2)	(4)
Anger (1)				
Stress (2)				
Feelings, general (3)				
Sadness (5)				
Page and Paragraph for Discussion (4)				

Q21 FOOD BELIEFS

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not Sure/ Discuss (4)	(0)	(1)	(2)	(4)
Food Habits (1)				
Food Preference/Avoidance (2)				
Acquisition/use of nutrition knowledge (3)				
Health belief or attitude, foods general (4)				
Lack of nutrition knowledge (5)				
Belief or attitude about Mexican/cultural foods (6)				
Page and Paragraph for Discussion (7)				

Q22 PHYSICAL ACTIVITY BELIEFS

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not Sure/ Discuss (4)	(0)	(1)	(2)	(4)
Physical activity habits (1)				
Physical activity preference/avoidance (2)				
Physical activity beliefs or attitudes (3)				
Page and Paragraph for Discussion (4)				

Q23 COMMUNICATION

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not Sure/ Discuss (4)	(0)	(1)	(2)	(4)
Language Consideration (1)				
Page and Paragraph for Discussion (2)				

Q24 SUPPORT

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not Sure/ Discuss (4)	(0)	(1)	(2)	(4)
Non-family influences (1)				
Healthcare support (2)				
Non-specific support (3)				
Lack of support by healthcare provider (4)				
Overcoming barriers (6)				
Page and Paragraph for Discussion (5)				

Q25 RESOURCES

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not Sure/ Discuss (4)	(0)	(1)	(2)	(4)
Cost (1)				
Food Access (2)				
Page and Paragraph for Discussion (3)				

Q35 Surface Level topics addressed in curricula

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not Sure/ Discuss (4)	(0)	(1)	(2)	(4)
Eye care - ophthalmology 1/yr (1)				
foot care - podiatrist/Dr. 1/yr (2)				
medication adherence (timing, ask dr. about changing, adjusting, or stopping meds) (3)				
self-monitoring with glucometer (level of glucose, times per day, etc.) (4)				
hyperglycemia (what to do) (6)				
hypoglycemia (what to do) (7)				
Other (8)				

Surface level elements

Q2 Title of curriculum

Q2 Surface Level topics addressed in curricula

No, the element is not present [0] Yes, the element is present [1] Yes, the element is present AND there is recommendation/instruction on how the healthcare professional should address the cultural element [2] Not sure/Discuss (3)	(0)	(1)	(2)	(3)
Eye care - ophthalmology 1/yr (1)				
foot care - podiatrist/Dr. 1/yr (2)				
medication adherence (timing, ask dr. about changing, adjusting, or stopping meds) (3)				
self-monitoring with glucometer (level of glucose, times per day, etc.) (4)				
hyperglycemia (what to do) (5)				
hypoglycemia (what to do) (6)				
Other (7)				
Does curriculum indicate if facilitator should be bilingual? (8)				

APPENDIX I: Summary of articles results, CASP checklist scores and cultural elements.

Article Title,	Type of	Theoretical	Number of	Summary of Results	CASP	Number of
Journal date of	Research	basis/	participants in	5	Checkli	Deep and
publication and	method	framework if	study; %		st Score	Surface
authors		any	female			Level
		-				Cultural
						Elements
The Role and	In-depth	Kleinman's	Interviews: 22,	Susto was reported as a cause that	18/38=	Deep: 14
Meaning of Susto	interviews	Explanatory	18/22= 81.8%	may lead to a person developing	474%	Surface: 5
in Mexican-	and Focus	model	Female	T2DM. Not time dependent.	JP 21	
Americans'	groups		Focus Groups:	Symptoms of T2DM were consistent	MR 23	
Explanatory			25, 19/25=	with medical definitions and		
Model of Type 2			76.0% female	descriptions.		
Diabetes Medical				Treatment of T2DM included a		
Anthropology				combination of allopathic-based		
Quarterly, J. Poss				treatment and traditional, folk		
and M.A.				remedies.		
Jezewski, 2002.				Diet was discussed within the heading		
(180)				of treatment.		

Table I.1 Summary of articles results, CASP checklist scores and cultural elements

Table I.1 (cont'd)						
Mexican	In-depth	Kleinman's	Interviews: 22,	Explanatory model of T2DM includes	18/38=	Deep: 16
Americans'	interviews	Explanatory	18/22= 81.8%	both western medicine and traditional	47.4%	Surface: 7
Explanatory	and Focus	Model	female	health beliefs.	JP 18	
Model of Type 2	groups	framework	Focus Groups:	Susto was reported to be an emotion	MR 17	
Diabetes, West J		and grounded	25, 19/25=	that causes T2DM.		
Nurs Res, M.A.		theory	76.0% female	Symptoms of susto were not		
Jezewski and J.				consistent among participants.		
Poss, 2002. (173)				Susto events were described in		
				relation to how they caused T2DM.		
				There was no time relation in regards		
				to susto and when T2DM was onset or		
				diagnosed.		
				Treatments for susto were not		
				consistent among participants.		
				Participants did not relate individual		
				susceptibility to T2DM and susto, but		
				rather, reported individual		
				characteristics of participants to be		
				related to T2DM susceptibility.		

Table I.1 (cont'd)						
Perceptions of	Focus	None	Focus group: 5	Suffering from diabetes was how	JP 24	Deep: 14
Barriers in	groups	provided	with 73	participants described living with	MR 21	Surface: 6
Managing			participants,	T2DM, in both the physical and		
Diabetes			75% female	emotional sense.		
Perspectives of				Difficulties of managing diabetes		
Hispanic				were relative to taking medications,		
Immigrant				having control of their diet, and		
Patients and				participating in physical activity.		
Family Members				Lack of resources and support were		
The Diabetes				reported by participants both from the		
Educator J. Hu,				overall healthcare system/providers		
K. Amirehsani,				and also from family.		
D.C. Wallace and				-		
S. Letvak, 2013.						
(232)						

Secondary	Secondary	Kleinman's	20 participants,	Defining diabetes was usually in the	JP 18	Deep: 15
analysis of	analysis of	explanatory model of	100% temale	context of consequences or	MR 14	Surface: 8
meanings of type	interviews	illness		Getting diabetes was discussed in		
2 diabetes among		micss		relation to heredity and the types of		
Mexican				foods consumed (sweets).		
American Women				Having diabetes was described in		
The Diabetes				relation to the definition of having		
Educator F.				high "sugar," and as a confusing		
Alcozer, 2000.				illness.		
(1/4)				Describing diabetes was under the		
				symptoms		
				Taking care of diabetes included		
				health professionals, family and		
				traditional, folk remedies.		
				Meaning of diabetes was again in		
				relation to the consequences and		
				symptoms.		

Evaluating Guiding Questions for an Ethnographic Study of Mexican American Women with Diabetes <i>Hispanic Health</i> <i>Care</i> <i>International</i> S. Benavides-Vaello and S.A. Brown, 2010. (172)	Individual interviews	Model of Dietary Change by Jerome, Kandel, and Pelto (1980) and the Self- Regulation Model by Leventhal, Meyer, and Nerenz (1980)	9 participants, 100% female	Portion size and frequency in relation to cultural foods were reported changes participants made or tried to make. Traditional foods and celebrations were important to participants and less likely to modify their behaviors. Acquiring taste takes time was a theme in regards to making modifications to the usual or traditional ways of cooking that they learned in diabetes education classes. Food as gifts is a common practice among participants in the study and felt that modifying foods for other was not acceptable practice, however, it can be used as support for another individual with a diet-related disease.	JP 19 MR 21	Deep: 5 Surface: 8
Azucar y nervios: Explanatory models and treatment experiences of Hispanics with diabetes and depression <i>Social</i> <i>Science &</i> <i>Medicine</i> L. J. Cabassa, M.C. Hansen, L.A. Palinkas, K. Ell, 2008. (175)	Focus groups and in-depth interviews	none	19 participants, 84.2% female	The diabetes and depression relationship was often reported to be that diabetes lead to depression through reductions in functions of daily life, the challenges of diabetes, and that diabetes affected their emotional health.	JP - 26 MR - 25	Deep: 6 Surface: 0

Cultural Values	Focus	Critical	40 participants	Diabetes is tied to mental and bodily	IP 24	Deen: 11
and Political	groups	ethnography _	68% female	states such as diet and glucose	MR 22	Surface: 3
Feonomic	Stoups	"looks for		monitoring and also stress	14111 22	Surface. J
Contexts of		natterns of		depression and fatigue		
Diabetes Among		social		Managing emotions and glucose are		
Low-Income		domination		both important for diabetes and in		
Mexicon		hierarchy and		examples provided participants		
Amoricons		social		reported 1) that managing the amotion		
Americans Iournal of		bula		also helped manage diabetes and 2)		
Journal Of Tuana cultural		privilege,		Lish glugge levels lead to emotions		
Transcultural		examining the		High glucose levels lead to emotions		
Nursing L. Clark,		power that		Such as anger.		
D. vincent, L. \mathbf{Z}^{\prime}		noids patterns		Stress was considered a result of		
Zimmer, J.		in place, how		diabetes and also a problem for		
Sanchez, 2009.		people accept		controlling it.		
(184)		or struggle		Addiction language was used to		
		against them.		describe their failure to adhere to diet.		
		The focus is		Family and neighborhood		
		on patterns		environment could cause stress and be		
		that reveal		a barrier to performing diabetes		
		injustice, like		related care behaviors.		
		lack of access		Healthcare environment, especially		
		to institutions,		related to health insurance posed		
		or poverty"		problems in self-care behaviors such		
		1 V		as SMGB and taking medication.		

Attitudes and	Focus	NA	42 participants,	Diabetes was defined as a life-	JP 20	Deep: 9
Beliefs among	groups		67% female	threatening illness.	MR 21	Surface: 6
Mexican				Perception of diabetes symptoms were		
Americans				consistent with those described in		
about Type 2				medical settings.		
Diabetes Journal				Cause of diabetes was associated with		
of Health Care for				family history, diet high in fat and		
the Poor and				sugar, obesity and engaging in		
Underserved G.D.				minimal exercise, but also strong		
Coronado, B.				emotion, susto.		
Thompson, S.				Beliefs about diabetes treatment		
Tejeda, R.				included diet, exercise, oral medicine		
Godina, 2004.				and insulin, and natural cures such as		
(87)				nopal, savila and special beverages.		

1 able 1.1 (cont ^o)	Table	I.1	(cont'd)
---------------------------------	-------	-----	----------

Acculturation and Diabetes in a New Hispanic Community <i>Hispanic Health</i> <i>Care</i> <i>International</i> S. Hadwiger, 2005. (240)	Formal interviews	NA	10 participants, 70% female	In the families, generally the women are the ones who give care, so men depended on them for diabetes care. I don't have any serious problems associated with diabetes maybe because mean diagnosis time was 3.5years. I can care for myself and did not depend on professionals. The care in Mexico or the place from where I came due to relationship with healthcare professional or the cost of care. I discovered here that I had diabetes either due to emotional experiences or having not been checked before arriving in U.S. Cost, language and discrimination were also barriers in their care.	JP 26 MR 23	Deep: 8 Surface: 3
*Pathways to Depression Care: Help-Seeking Experiences of Low-Income Latinos with Diabetes and Depression J Immigrant Minority Health M.C. Hansen L.J. Cabassa, 2012. (181)	Focus groups	Grounded theory approach	19 participants, 84.2% female	The study findings did not distinguish or describe similarities or differences in themes by disease, diabetes or depression.	JP 25 MR 26	Deep: 9 Surface: 2

Living with	Interviews	Kleinman's	12, 50% female	Usualness of diabetes due to number	JP 20	Deep: 9
Diabetes:		Explanatory		of friends and family with the disease	MR 18	Surface: 2
Perceptions of		Model		and the severity of complications in		
Hispanic Migrant				them.		
Farmworkers				Causes of diabetes was associated		
Journal of				with fatalism and folk belief model, a		
Community				life stressor happened at time of or		
<i>Health Nursing</i> L.				near time of diagnosis.		
Heuer and C.				Symptoms prior to the diagnosis of		
Lausch, 2006.				diabetes that led to anger and family		
(241)				discord.		
				Lacked understanding that diabetes		
				requires lifelong management.		
				Impact of diabetes on daily life		
				impacted their energy levels, intimate		
				relationships, and feelings of		
				depression.		
				Fear of long-term complications		
				related to diabetes were also reported		
				by participants.		
Herbs, Prayer, and	In-depth	NA	43, 49% female	Herbal treatments were reported by	JP 19	Deep: 7
Insulin, Journal of	interviews			84% of participants such as nopal and	MR 17	Surface: 2
Family Practice				aloe vera although only 2/3 of		
L.M. Hunt, 2000.				participants had not used them. Of the		
(242)				those using them 9% reported it was		
				for controlling blood glucose.		
				Prayer was perceived to help with		
				diabetes and god had a direct		
				influence on disease management in		
				combination with medical treatments.		

Overcoming	In-depth	Banduras	50 participants,	The traditional "Hispanic" diet was	JP 17	Deep: 9
Cultural Barriers	interviews	social	74% female	associated with identity by	MR 16	Surface: 4
to Diabetes		cognitive		participants.		
Control a		theory		Support by family was perceived to		
Qualitative Study				influence motivation to managed		
of Southwestern				T2DM.		
New Mexico				Denial was more common among		
Hispanics Journal				men and attributed to machismo.		
of Cultural				Intergenerational legacy of diabetes		
Diversity				led to awareness and readiness to		
McCloskey J.,				make healthy behavior changes.		
Flenniken, D.,				Empowerment was a theme expressed		
2010. (80)				by women stating their belief that they		
				could control and maintain good		
				health through self-management		
				behaviors.		

Partnering with	Focus	Content	24 participants	Strategies can be done as a family for	JP 21	Deep: 9
Families to Refine	groups	Analysis		managing T2DM, physical activity	MR 22	Surface: 4
and Expand a				and healthy eating.		
Diabetes				Participants wanted their family		
Intervention for				environment to "be sensitive to my		
Mexican				challenges" such as types of foods		
Americans The				consumed and in some cases, family		
Diabetes				was not helpful in making healthy		
Educator M M				behavior changes		
McEwen and C				Family members were causing		
Murdaugh 2014				frustration and anger by telling		
(229)				narticipants what to eat or do		
(22))				"How can we neacefully coexist"		
				represented the inability of		
				norticipants and family members to		
				participants and family members to		
				compromise.		
				Some participants felt supported by		
				their family members in managing		
				their diabetes.		

Tuble III (colle u)						
Using the PEN-3	Focus	Mixed method	18 participants,	Background knowledge about	JP 18	Deep: 16
Model to Assess	groups	study; PEN-3	9 females	diabetes was associating the disease	MR 16	Surface: 4
Knowledge,		Model		with family members of a fatalistic		
Attitudes, and				viewpoint.		
Beliefs about				Sources of information were preferred		
Diabetes Type 2				in Spanish language.		
among Mexican				Healthcare system in U.S. is		
American and				perceived to not be supportive from		
Mexican Native				no understanding the patient's		
Men and Women				preferences.		
in North Texas				Personal and family experiences		
International				appears to be in the need of support		
Electronic				from family to manage diabetes.		
Journal of Health						
Education J.						
Melancon, J.						
Oomen-Early,						
L.M. del Rincon,						
2009. (182)						
Home Remedies	Interviews	Kleinmans	22 participants,	Participants perceived insulin to be	JP 19	Deep: 3
for Type 2		explanatory	81.8% female	associated with poor T2DM control.	MR 16	Surface: 3
Diabetes Used by		model of		Participants believed that both herbal		
Mexican		illness		and western medicines were effective		
Americans in El				together.		
Paso, <i>Clinical</i>				Participants perceived herbal remedies		
Nursing Research				to be "natural" and therefore preferred		
Texas J.E. Poss,				to use these.		
M.A. Jezewski,				The most common home remedy used		
A.G. Stuart, 2003.				was <i>nopal</i> because they believed it to		
(90)				help control diabetes.		

Table I.1 (cont'd)						
Adherence to diabetes self-care behaviors in English- and Spanish-speaking Hispanic Men <i>Patient</i> <i>Preference and</i> <i>Adherence</i> Lo.O. Rustveld, V.N. Pavlik, M.L. Jibaja-Weiss, K.N. Kline, J.T. Gossey, R.J. Volk, 2009. (40)	Focus groups	No theory, Qualitative research in health care	34 participants, no female	Knowledge of diabetes management recommendations were relative to the importance of diet, medication and physical activity. Barriers to self-care included depression and difficulty in applying guidelines to daily routine. Self-esteem was negatively affected as illness was a sign of weakness. Fatalism was reported by participants as a reason not to adhere to treatment plan. Lack of knowledge about portion sizes and difficulty in limiting the amount of food eaten were barriers relative to diet. Reluctance to alter lifestyle was relative to diet and not wanting to give up their favorite foods. Importance of social traditions related to special occasions made adhering to diabetes management behaviors difficult. Physical activity was a barrier either due to diabetes complications or belief that the activity from labor- intensive work was already physical activity. Taking medications was believed to be the treatment for diabetes and was not perceived to be in conjunction with diet and physical activity.	JP 17 MR 19	Deep: 11 Surface: 7

*Missing the	Semi-	Social	15 participants,	Data saturation was not reached and it	JP 19	Deep: 11
Mark with Latina	structured	Cognitive	100% female	was not clear on how results were	MR 20	Surface: 6
Women With	Interviews	Theory		reached from data.		
Type 2 Diabetes				Nutrition knowledge occurred through		
Implications for				observational learning.		
Educators The				Participants in this study reported		
Diabetes				using <i>naturistas</i> to provide herbal or		
Educator M.T.				"natural" remedies.		
Sawyer and C.K.				Food environment made it difficult to		
Deines, 2013.				make better food choices.		
(228)				Social environment or choices made		
				by the women with regards to foods		
				were based on the preferences of		
				family members and made it difficult		
				to avoid less healthy foods.		

Diabetes Self- management in a Latino Social Environment <i>The</i> <i>Diabetes</i> <i>Educator</i> Dawn M. Weiler, PhD, APRN-ANP Janice D. Crist, 2009. (243)	In-depth semi structured interviews	Grounded theory technique	10 participants, 60% female	Family cohesion represents the concept of familismo where the health of the individual was overshadowed by the health of the family. Family was often a primary motivator for disease management. Stigma of diabetes was perceived to have social implications and thus denial and embarrassment. Perceptions of illness in others often affected social aspects such as participation in gatherings where food was involved. Disease knowledge and understanding was lacking in areas related to diet,	JP 18 MR 19	Deep: 10 Surface 5
				Disease knowledge and understanding was lacking in areas related to diet,		
				progress of disease into		
				complications, and preferring for		
				education to be a family event.		

APPENDIX J: Sensitivity Testing Results for Exploratory Factor and Cluster Analyses

	Factor	Factor	Factor	Factor	Factor	Factor
	1	2	3	4	5	6
Emotions						
Depression	0.66	0.11	0.21	0.06	0.12	0.02
Anger	0.82	0.15	0.15	0.02	0.08	0.06
Beliefs about susto	0.56	0.23	0.10	0.13	0.32	0.11
Beliefs about Herbal and Traditiona	l Treatm	ents				
Beliefs about tea	0.22	0.68	0.13	0.10	0.12	0.18
Beliefs about nopal/cactus	0.28	0.59	0.10	0.12	0.07	0.19
Beliefs about alternative treatments	0.18	0.59	0.29	0.00	0.23	0.16
Beliefs about herbal/folk medicine	0.07	0.63	0.16	0.11	0.26	0.11
Health Beliefs						
Beliefs about medicine/insulin	0.10	0.22	0.53	0.12	0.14	-0.12
Lack of support from Healthcare						
professionals	0.13	0.27	0.52	-0.01	0.12	0.16
Beliefs about foods	0.20	0.11	0.63	0.15	0.10	-0.04
Physical Activity Beliefs	0.27	0.04	0.57	0.02	0.02	0.21
Beliefs about Foods						
Beliefs about Mexican Foods	0.03	0.09	0.15	0.86	0.03	0.01
Beliefs about American foods	0.08	0.10	0.04	0.86	0.02	-0.02
Religion and Gender						
Beliefs about religion	0.23	0.28	0.12	0.06	0.58	0.07
Gender (Machismo/Marianismo)	0.34	0.20	0.13	-0.05	0.51	0.18
Family Elements						
Familismo	0.03	0.13	-0.06	-0.07	0.04	0.51
Family involvement	0.08	0.21	0.22	0.11	0.13	0.62
Non-loading Cultural Elements						
Shame	0.07	0.21	0.17	0.02	0.18	0.04
Fatalism	0.36	0.13	0.20	0.06	0.32	0.07
Family turmoil	0.30	0.18	0.12	0.20	0.18	0.25
Eigenvalue	2.61	2.06	1.67	1.65	1.09	0.95
Percent of variance/difference	0.55	0.39	0.02	0.55	0.15	0.67
Proportion	0.27	0.22	0.17	0.17	0.11	0.10
Cumulative	0.27	0.49	0.66	0.84	0.95	1.05

Table J.1. Sensitivity testing results for exploratory factor analysis of deep-level cultural elements. (n=174)

	Factor 1	Factor 2
Food preferences	0.49	-0.01
Food Habits		
Nutrition knowledge	0.50	0.18
Language preferences	0.00	0.26
Healthcare provider preferences	0.11	0.31
Eigenvalue	0.51	0.20
Percent of variance/difference	0.31	
Proportion	1.41	0.56
Cumulative	1.41	1.97

Table J.2. Sensitivity testing results for exploratory factor analysis of surface-level cultural elements. (n=174)

* Food habits was dropped from sensitivity analysis due to zero variance, all 174 participants selected 1-strongly agree and 2-agree with regards to importance for T2DM self-management.

BIBLIOGRAPHY

BIBLIOGRAPHY

- 1. Evert AB, Boucher JL, Cypress M, Dunbar SA, Franz MJ, Mayer-Davis EJ, et al. Nutrition therapy recommendations for the management of adults with diabetes. Diabetes Care. 2014;37(Supplement 1):S120-S43.
- 2. Ennis SR, Rios-Vargas M, Albert NG. The Hispanic Population 2010: 2010 Census Briefs. Washington, DC: US Census Bureau. 2011.
- 3. American Diabetes Association. 5. Glycemic Targets. Diabetes Care. 2016;39(Supplement 1):S39-S46.
- 4. Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 2002;346(6):393-403.
- Nathan DM. Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) Study Research Group: Intensive diabetes treatment and cardiovascular disease in patients with type 1 diabetes. N Engl J Med. 2005;353:2643-53.
- 6. American Diabetes Association. Introduction. Diabetes Care. 2015 January 1, 2015;38(Supplement 1):S1-S2.
- 7. American Diabetes Association. 4. Foundations of Care: Education, Nutrition, Physical Activity, Smoking Cessation, Psychosocial Care, and Immunization. Diabetes Care. 2015 January 1, 2015;38(Supplement 1):S20-S30.
- 8. Cusi K, Ocampo GL. Unmet needs in Hispanic/Latino patients with type 2 diabetes mellitus. Am J Med. 2011 Oct;124(10 Suppl):S2-9.
- 9. Légaré F, Witteman HO. Shared Decision Making: Examining key elements and barriers to adoption into routine clinical practice. Health Affairs. 2013;32(2):276-84.
- 10. Gonzalez-Barrera A, Lopez MH. A demographic portrait of Mexican-origin Hispanics in the United States 2013 [Available from: http://www.pewhispanic.org/files/2013/05/2013-04_Demographic-Portrait-of-Mexicans-in-the-US.pdf..
- Centers for Disease Control and Prevention. Health Disparities Experienced by Hispanics - United States. Morb Mortal Wkly Rep. 2004;53(40):935.
- 12. Plasencia J. Relation of acculturation to glycemic control and self-management of diabetes in Hispanic adults [1455753]. Ann Arbor: Michigan State University; 2008.
- 13. Brown SA, Hanis CL. A community-based, culturally sensitive education and groupsupport intervention for Mexican Americans with NIDDM: a pilot study of efficacy. Diabetes Educ. 1995 May-Jun;21(3):203-10.
- 14. Philis-Tsimikas A, Fortmann A, Lleva-Ocana L, Walker C, Gallo LC. Peer-led diabetes education programs in high-risk Mexican Americans improve glycemic control compared with standard approaches: a Project Dulce promotora randomized trial. Diabetes Care. 2011 Sep;34(9):1926-31.
- 15. Rothschild SK, Martin MA, Swider SM, Tumialan Lynas CM, Janssen I, Avery EF, et al. Mexican American trial of community health workers: a randomized controlled trial of a community health worker intervention for Mexican Americans with type 2 diabetes mellitus. Am J Public Health. 2014 Aug;104(8):1540-8.
- 16. Sixta CS, Ostwald S. Texas-Mexico border intervention by promotores for patients with type 2 diabetes. Diabetes Educ. 2008 Mar-Apr;34(2):299-309.
- 17. Resnicow K, Baranowski T, Ahluwalia JS, Braithwaite RL. Cultural sensitivity in public health: defined and demystified. Ethn Dis. 1999;9(1):10-21.
- 18. American Diabetes Association. Standards of medical care in diabetes—2014. Diabetes Care. 2014;37(Supplement 1):S14-S80.
- 19. Colby SL, Ortman JM. Projections of the Size and Composition of the US Population: 2014 to 2060. US Census Bureau, Ed. 2015:25-1143.
- 20. Pérez-Escamilla R. Acculturation, nutrition, and health disparities in Latinos. Am J Clin Nutr. 2011 May;93(5):1163S-7S.
- 21. Narayan KV, Boyle JP, Thompson TJ, Sorensen SW, Williamson DF. Lifetime Risk for Diabetes Mellitus in the United States. JAMA. 2003;290(14):1884-90.
- 22. Schneiderman N, Llabre M, Cowie CC, Barnhart J, Carnethon M, Gallo LC, et al. Prevalence of diabetes among hispanics/latinos from diverse backgrounds: the hispanic community health study/study of latinos (HCHS/SOL). Diabetes Care. 2014;37(8):2233-9.
- 23. Daviglus ML, Talavera GA, Avilés-Santa M, et al. Prevalence of major cardiovascular risk factors and cardiovascular diseases among hispanic/latino individuals of diverse backgrounds in the united states. JAMA. 2012;308(17):1775-84.
- 24. Cowie CC, Rust KF, Byrd-Holt DD, Gregg EW, Ford ES, Geiss LS, et al. Prevalence of diabetes and high risk for diabetes using A1C criteria in the U.S. population in 1988-2006. Diabetes Care. 2010 Mar;33(3):562-8.
- 25. Centers for Disease Control and Prevention. National diabetes statistics report: estimates of diabetes and its burden in the United States, 2014. Atlanta, GA: US Department of Health and Human Services. 2014.
- 26. American Diabetes Association. 4. Prevention or Delay of Type 2 Diabetes. Diabetes Care. 2016;39(Supplement 1):S36-S8.

- 27. Albers JW, Herman WH, Pop-Busui R, Feldman EL, Martin CL, Cleary PA, et al. Effect of prior intensive insulin treatment during the Diabetes Control and Complications Trial (DCCT) on peripheral neuropathy in type 1 diabetes during the Epidemiology of Diabetes Interventions and Complications (EDIC) Study. Diabetes Care. 2010;33(5):1090-6.
- 28. American Diabetes Association. 2. Classification and Diagnosis of Diabetes. Diabetes Care. 2016;39(Supplement 1):S13-S22.
- 29. Gabbay KH. Glycosylated hemoglobin and diabetes mellitus. Med Clin North Am. 1982 Nov;66(6):1309-15.
- Rao GM, Morghom LO, Abukhris AA, Mansori SS, Alphgih FA, Ragale LY. Glycosylated haemoglobin and blood glucose levels in Libyan diabetic patients. Trop Geogr Med. 1986 Dec;38(4):391-7.
- 31. Funnell MM, Brown TL, Childs BP, Haas LB, Hosey GM, Jensen B, et al. National standards for diabetes self-management education. Diabetes care. 2011;34(Supplement 1):S89-S96.
- 32. Centers for Disease Control and Prevention. Measuring Physical Activity Intensity 2015 [updated June 4, 2015.
- 33. United States Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans Washington, DC: US Department of Health and Human Services; 2008 [Available from: http://www.health.gov/paguidelines/pdf/paguide.pdf.
- 34. Johnson NB, Hayes LD, Brown K, Hoo EC, Ethier KA. CDC National Health Report: Leading causes of morbidity and mortality and associated behavioral risk and protective factors-United States, 2005-2013. MMWR Surveill Summ. 2014 Oct 31;63:3-27.
- 35. Nelson KM, Reiber G, Boyko EJ. Diet and exercise among adults with type 2 diabetes: findings from the third national health and nutrition examination survey (NHANES III). Diabetes Care. 2002 Oct;25(10):1722-8.
- 36. Loprinzi PD, Pariser G. Physical activity intensity and weight control status among U.S. Adults with diabetes. Am J Health Promot. 2014 Sep-Oct;29(1):17-22.
- 37. Wood FG. Leisure time activity of Mexican Americans with diabetes. J Adv Nurs. 2004 Jan;45(2):190-6.
- Neighbors CJ, Marquez DX, Marcus BH. Leisure-time physical activity disparities among Hispanic subgroups in the United States. Am J Public Health. 2008 Aug;98(8):1460-4.
- 39. National Center for Health Statistics NHANES III -. Third National Health and Nutrition Examination Survey, 1988-91. 1995; Version 1. Available from: https://wonder.cdc.gov/wonder/sci_data/surveys/hanes/hanes3/type_txt/demohaq.asp.

- 40. Rustveld LO, Pavlik VN, Jibaja-Weiss ML, Kline KN, Gossey JT, Volk RJ. Adherence to diabetes self-care behaviors in English- and Spanish-speaking Hispanic men. Patient Prefer Adherence. 2009;3:123-30.
- 41. He XZ, Baker DW. Differences in leisure-time, household, and work-related physical activity by race, ethnicity, and education. J Gen Intern Med. 2005;20(3):259-66.
- 42. Ortiz-Hernández L, Ramos-Ibáñez N. Sociodemographic factors associated with physical activity in Mexican adults. Public Health Nutr. 2010 Jul;13(7):1131-8.
- 43. Martinez SM, Ayala GX, Patrick K, Arredondo EM, Roesch S, Elder J. Associated pathways between neighborhood environment, community resource factors, and leisure-time physical activity among Mexican-American adults in San Diego, California. Am J Health Promot. 2012;26(5):281-8.
- 44. Siega-Riz AM, Sotres-Alvarez D, Ayala GX, Ginsberg M, Himes JH, Liu K, et al. Foodgroup and nutrient-density intakes by Hispanic and Latino backgrounds in the Hispanic Community Health Study/Study of Latinos. Am J Clin Nutr. 2014;99(6):1487-98.
- 45. Ahern J, Grove N, Strand T, Wesche J, Seibert C, Brenneman AT, et al. The impact of the trial coordinator in the Diabetes Control and Complications Trial (DCCT). The DCCT Research Group. Diabetes Educ. 1993 Nov-Dec;19(6):509-12.
- 46. The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. The Diabetes Control and Complications Trial Research Group. N Engl J Med. 1993 Sep 30;329(14):977-86.
- 47. American Diabetes Association. Consensus statement on the worldwide standardization of the hemoglobin A1C measurement: the American Diabetes Association, European Association for the Study of Diabetes, International Federation of Clinical Chemistry and Laboratory Medicine, and the International Diabetes Federation. Diabetes Care. 2007 Sep;30(9):2399-400.
- 48. Link CL, McKinlay JB. Disparities in the prevalence of diabetes: is it race/ethnicity or socioeconomic status? Results from the Boston Area Community Health (BACH) survey. Ethn Dis. 2009 Summer;19(3):288-92.
- 49. DeNavas-Walt C, Proctor BD, Smith JC. Income, poverty, and health insurance coverage in the United States: 2010. 2011. Washington, DC: US Government Printing Office. Available from: http://www.census.gov/prod/2011pubs/p60-239.pdf.
- 50. Tamayo T, Christian H, Rathmann W. Impact of early psychosocial factors (childhood socioeconomic factors and adversities) on future risk of type 2 diabetes, metabolic disturbances and obesity: a systematic review. BMC Public Health. 2010;10:525.
- 51. Saydah S, Lochner K. Socioeconomic status and risk of diabetes-related mortality in the U.S. Public Health Rep. 2010;125(3):377-88.

- 52. Stark Casagrande S, Ríos Burrows N, Geiss LS, Bainbridge KE, Fradkin JE, Cowie CC. Diabetes knowledge and its relationship with achieving treatment recommendations in a national sample of people with type 2 diabetes. Diabetes Care. 2012 Jul;35(7):1556-65.
- 53. Coronado GD, Thompson B, Tejeda S, Godina R, Chen L. Sociodemographic factors and self-management practices related to type 2 diabetes among Hispanics and non-Hispanic whites in a rural setting. J Rural Health. 2007 Winter;23(1):49-54.
- 54. Mier N, Smith ML, Carrillo-zuniga G, Wang X, Garza N, Ory MG. Personal and cultural influences on diabetes self-care behaviors among older Hispanics born in the U.S. and Mexico. J Immigr Minor Health. 2012;14(6):1052-62.
- 55. Robbins JM, Thatcher GE, Webb DA, Valdmanis VG. Nutritionist visits, diabetes classes, and hospitalization rates and charges: the Urban Diabetes Study. Diabetes Care. 2008 Apr;31(4):655-60.
- 56. Brown SA, Hanis CL. Lessons learned from 20 years of diabetes self-management research with Mexican Americans in Starr County, Texas. Diabetes Educ. 2014 July 1, 2014;40(4):476-87.
- 57. Yoon J, Grumbach K, Bindman AB. Access to Spanish-speaking physicians in California: supply, insurance, or both. J Am Board Fam Pract. 2004 May-Jun;17(3):165-72.
- 58. Ershow AG. Environmental influences on development of type 2 diabetes and obesity: challenges in personalizing prevention and management. J Diabetes Sci Technol. 2009;3(4):727-34.
- 59. Grieco P. Race and Hispanic Origin of the Foreign-Born Population in the United States: 2007. American Community Survey Reports, ACS-11, U.S. Census Bureau, Washington, DC. Available from: https://www.census.gov/prod/2010pubs/acs-11.pdf.
- 60. Afable-Munsuz A, Mayeda ER, Pérez-Stable EJ, Haan MN. Immigrant generation and diabetes risk among Mexican Americans: the Sacramento Area Latino Study on Aging. Am J Public Health. 2013 May;103(5):e45-52.
- 61. Rivera JA, Barquera S, Campirano F, Campos I, Safdie M, Tovar V. Epidemiological and nutritional transition in Mexico: rapid increase of non-communicable chronic diseases and obesity. Public Health Nutr. 2002 Feb;5(1A):113-22.
- 62. Stern D, Piernas C, Barquera S, Rivera JA, Popkin BM. Caloric beverages were major sources of energy among children and adults in Mexico, 1999-2012. J Nutr. 2014 Jun;144(6):949-56.
- Rivera JA, Barquera S, González-Cossío T, Olaiz G, Sepúlveda J. Nutrition Transition in Mexico and in Other Latin American Countries. Nutrition Rev. 2004 Jul 1;62(suppl 2):S149-57.

- 64. Mattei J, Malik V, Wedick NM, Hu FB, Spiegelman D, Willett WC, et al. Reducing the global burden of type 2 diabetes by improving the quality of staple foods: The Global Nutrition and Epidemiologic Transition Initiative. Global Health. 2015;11(1):1-20.
- 65. Salvo D, Torres C, Villa U, Rivera JA, Sarmiento OL, Reis RS, et al. Accelerometerbased physical activity levels among Mexican adults and their relation with sociodemographic characteristics and BMI: a cross-sectional study. Int J Behav Nutr Phy. 2015;12(1):1-11.
- 66. Fitzgerald N, Damio G, Segura-Perez S, Perez-Escamilla R. Nutrition knowledge, food label use, and food intake patterns among Latinas with and without type 2 diabetes. J Am Diet Assoc. 2008 Jun;108(6):960-7.
- 67. Ayala GX, Baquero B, Klinger S. A systematic review of the relationship between acculturation and diet among Latinos in the United States: implications for future research. J Am Diet Assoc. 2008 Aug;108(8):1330-44.
- 68. Cuellar I, Arnold B, Maldonado R. Acculturation rating scale for Mexican Americans-II: A revision of the original ARSMA scale. Hisp J Behav Sci. 1995;17(3):275.
- 69. Ghaddar S, Brown CJ, Pagan JA, Diaz V. Acculturation and healthy lifestyle habits among Hispanics in United States-Mexico border communities. Rev Panam Salud Publica. 2010 Sep;28(3):190-7.
- 70. Eamranond PP, Wee CC, Legedza AT, Marcantonio ER, Leveille SG. Acculturation and cardiovascular risk factor control among Hispanic adults in the United States. Public Health Rep. 2009 2009 Nov-Dec;124(6):818-24.
- 71. Batis C, Hernandez-Barrera L, Barquera S, Rivera JA, Popkin BM. Food acculturation drives dietary differences among Mexicans, Mexican Americans, and Non-Hispanic Whites. J Nutr. 2011 Oct;141(10):1898-906.
- 72. Colon-Ramos U, Thompson FE, Yaroch AL, Moser RP, McNeel TS, Dodd KW, et al. Differences in fruit and vegetable intake among Hispanic subgroups in California: results from the 2005 California Health Interview Survey. J Am Diet Assoc. 2009 Nov;109(11):1878-85.
- 73. Neuhouser ML, Thompson B, Coronado GD, Solomon CC. Higher fat intake and lower fruit and vegetables intakes are associated with greater acculturation among Mexicans living in Washington State. J Am Diet Assoc. 2004 Jan;104(1):51-7.
- 74. Himmelgreen DA, Perez-Escamilla R, Segura-Millan S, Romero-Daza N, Tanasescu M, Singer M. A comparison of the nutritional status and food security of drug-using and non-drug-using Hispanic women in Hartford, Connecticut. Am J Phys Anthropol. 1998 Nov;107(3):351-61.

- 75. Hubert HB, Snider J, Winkleby MA. Health status, health behaviors, and acculturation factors associated with overweight and obesity in Latinos from a community and agricultural labor camp survey. Prev Med. 2005 Jun;40(6):642-51.
- 76. van Rompay MI, McKeown NM, Castaneda-Sceppa C, Falcón LM, Ordovás JM, Tucker KL. Acculturation and sociocultural influences on dietary intake and health status among Puerto Rican adults in Massachusetts. J Acad Nutr Diet. 2012 Jan;112(1):64-74.
- 77. de Heer HD, Balcazar HG, Castro F, Schulz L. A path analysis of a randomized promotora de salud cardiovascular disease-prevention trial among at-risk Hispanic adults. Health Educ Behav. 2012 Feb;39(1):77-86.
- Wen LK, Shepherd MD, Parchman ML. Family support, diet, and exercise among older Mexican Americans with type 2 diabetes. Diabetes Educ. 2004 2004 Nov-Dec;30(6):980-93.
- 79. Morales López C, Burrowes JD, Gizis F, Brommage D. Dietary adherence in Hispanic patients receiving hemodialysis. J Ren Nutr. 2007 Mar;17(2):138-47.
- 80. McCloskey J, Flenniken D. Overcoming cultural barriers to diabetes control: a qualitative study of southwestern New Mexico Hispanics. J Cult Divers. 2010 Fall;17(3):110-5.
- 81. Evenson KR, Sarmiento OL, Ayala GX. Acculturation and physical activity among North Carolina Latina immigrants. Soc Sci Med. 2004;59(12):2509-22.
- 82. Crespo CJ, Smit E, Troiano RP, Bartlett SJ, Macera CA, Andersen RE. Television watching, energy intake, and obesity in US children Results from the Third National Health and Nutrition Examination Survey, 1988-1994. Arch Pediatr Adolesc Med. 2001 Mar;155(3):360-5.
- 83. Berrigan D, Dodd K, Troiano RP, Reeve BB, Ballard-Barbash R. Physical activity and acculturation among adult Hispanics in the United States. Res Q Exerc Sport. 2006 Jun;77(2):147-57.
- 84. Benitez TJ, Dodgson JE, Coe K, Keller C. Utility of acculturation in physical activity research in Latina adults: An integrative review of literature. Health Educ Behav. 2016 June 1, 2016;43(3):256-70.
- 85. Staten LK, Scheu LL, Bronson D, Pena V, Elenes J. Pasos Adelante: the effectiveness of a community-based chronic disease prevention program. Prev Chronic Dis. 2005 Jan;2(1):A18.
- 86. Albright CL, Schembre SM, Steffen AD, Wilkens LR, Monroe KR, Yonemori KM, et al. Differences by race/ethnicity in older adults' beliefs about the relative importance of dietary supplements vs prescription medications: results from the SURE Study. J Acad Nutr Diet. 2012 Aug;112(8):1223-9.

- Coronado GD, Thompson B, Tejeda S, Godina R. Attitudes and beliefs among Mexican Americans about type 2 diabetes. J Health Care Poor Underserved. 2004 Nov;15(4):576-88.
- 88. Brown SA, Garcia AA, Kamiar K, Hanis CL. Culturally competent diabetes selfmanagement education for Mexican Americans: The Starr County Border Health Initiative. Diabetes Care. 2002;25(2):259.
- 89. Heinrich M, Ankli A, Frei B, Weimann C, Sticher O. Medicinal plants in Mexico: healers' consensus and cultural importance. Soc Sci Med. 1998;47(11):1859-71.
- 90. Poss JE, Jezewski MA, Stuart AG. Home remedies for type 2 diabetes used by Mexican Americans in El Paso, Texas. Clin Nurs Res. 2003 Nov;12(4):304-23.
- 91. Ruiz JM, Steffen P, Smith TB. Hispanic mortality paradox: a systematic review and meta-analysis of the longitudinal literature. Am J Public Health. 2013 Mar;103(3):e52-60.
- 92. Ashida S, Wilkinson AV, Koehly LM. Social influence and motivation to change health behaviors among Mexican-origin adults: implications for diet and physical activity. Am J Health Promot. 2012 2012 Jan-Feb;26(3):176-9.
- 93. Asencio M. Marianismo. Encyclopedia of Immigrant Health: Springer; 2012. p. 1046-8.
- 94. Kosmin BA, Keysar A, Cragun R, Navarro-Rivera J. American nones: The profile of the no religion population, a report based on the American religious identification survey 2008. 2009.
- 95. D'Alonzo KT. The influence of marianismo beliefs on physical activity of immigrant Latinas. J Transcult Nurs. 2012;23(2):124-33.
- 96. Castro FG, Alarcón EH. Integrating cultural variables into drug abuse prevention and treatment with racial/ethnic minorities. J Drug Issues. 2002;32(3):783-810.
- 97. Brown SA, Hanis CL. Culturally competent diabetes education for Mexican Americans: The Starr County Study. Diabetes Educ. 1999 Mar-Apr;25(2):226-36.
- 98. Ockene IS, Tellez TL, Rosal MC, Reed GW, Mordes J, Merriam PA, et al. Outcomes of a Latino community-based intervention for the prevention of diabetes: The Lawrence Latino Diabetes Prevention Project. Am J Public Health. 2012;102(2):336-42.
- 99. Taylor T, Serrano E, Anderson J, Kendall P. Knowledge, skills, and behavior improvements on peer educators and low-income Hispanic participants after a stage of change-based bilingual nutrition education program. J Community Health. 2000;25(3):241-62.

- 100. Baig AA, Benitez A, Locklin CA, Gao Y, Lee SM, Quinn MT, et al. Picture Good Health: A church-based self-management intervention among Latino adults with diabetes. J Gen Intern Med. 2015;30(10):1481-90.
- 101. White BB. Hispanic family diabetes project: a pilot intervention study. Kinesiology Abstracts. 2006;19(1).
- 102. Rosal MC, Ockene IS, Restrepo A, White MJ, Borg A, Olendzki B, et al. Randomized trial of a literacy-sensitive, culturally tailored diabetes self-management intervention for low-income Latinos. Diabetes Care. 2011 Apr 1;34(4):838-44.
- 103. Castillo A, Giachello A, Bates R, Concha J, Ramirez V, Sanchez C, et al. Communitybased diabetes education for Latinos: The Diabetes Empowerment Education Program. Diabetes Educ. 2010 Jul-Aug;36(4):586-94.
- 104. Heisler M, Spencer M, Forman J, Robinson C, Shultz C, Palmisano G, et al. Participants' assessments of the effects of a community health worker intervention on their diabetes self-management and interactions with healthcare providers. Am J Prev Med. 2009 Dec;37(6 Suppl 1):S270-9.
- 105. Vincent D, McEwen MM, Hepworth JT, Stump CS. The effects of a community-based, culturally tailored diabetes prevention intervention for high-risk adults of Mexican descent. Diabetes Educ. 2014 March 1, 2014;40(2):202-13.
- 106. Ryan JG, Jennings T, Vittoria I, Fedders M. Short and long-term outcomes from a multisession diabetes education program targeting low-income minority patients: a sixmonth follow up. Clin Ther. 2013 Jan;35(1):A43-53.
- 107. Hu J, Wallace DC, McCoy TP, Amirehsani KA. A family-based diabetes intervention for Hispanic adults and their family members. Diabetes Educ. 2014;40(1):48-59.
- 108. Rosland AM, Piette JD, Choi H, Heisler M. Family and friend participation in primary care visits of patients with diabetes or heart failure: patient and physician determinants and experiences. Med Care. 2010 Jan;49(1):37-45.
- 109. Wallace MF, Fulwood R, Alvarado M. NHLBI step-by-step approach to adapting cardiovascular training and education curricula for diverse audiences. Prev Chronic Dis. 2008 Apr;5(2):A61.
- 110. Mier N, Ory MG, Medina AA. Anatomy of culturally sensitive interventions promoting nutrition and exercise in hispanics: a critical examination of existing literature. Health Promot Pract. 2010 Jul;11(4):541-54.
- 111. Kar SB, Alcalay R, Alex S. Health communication: A multicultural perspective: Sage Publications; 2000.
- 112. Goody CM, Drago L. Cultural food practices. American Dietetic Association; 2010.

- 113. Northouse L, Northouse P. Health communication: Strategies for health professionals Appleton & Lange. Stamford, CT. 1998.
- 114. Reimann JOF, Talavera GA, Salmon M, Nuñez JA, Velasquez RJ. Cultural competence among physicians treating Mexican Americans who have diabetes: A structural model. Soc Sci Med. 2004;59(11):2195-205.
- 115. Metghalchi S, Rivera M, Beeson L, Firek A, De Leon M, Balcazar H, et al. Improved clinical outcomes using a culturally sensitive diabetes education program in a Hispanic population. Diabetes Educ. 2008 2008 Jul-Aug;34(4):698-706.
- 116. Salto LM, Cordero-MacIntyre Z, Beeson L, Schulz E, Firek A, De Leon M. En Balance participants decrease dietary fat and cholesterol intake as part of a culturally sensitive Hispanic diabetes education program. Diabetes Educ. 2011 Mar-Apr;37(2):239-53.
- 117. Welch G, Allen NA, Zagarins SE, Stamp KD, Bursell SE, Kedziora RJ. Comprehensive diabetes management program for poorly controlled Hispanic type 2 patients at a community health center. Diabetes Educ. 2011 2011 Sep-Oct;37(5):680-8.
- 118. Glazier RH, Bajcar J, Kennie NR, Willson K. A systematic review of interventions to improve diabetes care in socially disadvantaged populations. Diabetes Care. 2006 Jul;29(7):1675-88.
- 119. Latham CL, Calvillo E. Predictors of successful diabetes management in low-income Hispanic people. West J Nurs Res. 2009 Apr;31(3):364-88.
- 120. Corsino L, Rocha-Goldberg MP, Batch BC, Ortiz-Melo DI, Bosworth HB, Svetkey LP. The Latino Health Project: pilot testing a culturally adapted behavioral weight loss intervention in obese and overweight Latino adults. Ethn Dis. 2012;22(1):51-7.
- 121. López-Romero P, Pichardo-Ontiveros E, Avila-Nava A, Vázquez-Manjarrez N, Tovar AR, Pedraza-Chaverri J, et al. The effect of nopal (opuntia ficus indica) on postprandial blood glucose, incretins, and antioxidant activity in Mexican patients with type 2 diabetes after consumption of two different composition breakfasts. J Acad Nutr Diet. 2014;114(11):1811-8.
- 122. Weller SC, Baer RD, Pachter LM, Trotter RT, Glazer M, Garcia de Alba Garcia JE, et al. Latino beliefs about diabetes. Diabetes Care. 1999 May;22(5):722-8.
- 123. Smith-Morris C, Morales-Campos D, Alvarez EAC, Turner M. An Anthropology of Familismo: On narratives and description of Mexican/immigrants. Hisp J Behav Sci. 2013 February 1, 2013;35(1):35-60.
- 124. Shumaker SA, Ockene JK, A. RK. The handbook of health behavior change. Third Edition ed: Springer Publishers, New York; 2008.
- 125. Lim J-w, Gonzalez P, Wang-Letzkus M, Ashing-Giwa K. Understanding the cultural health belief model influencing health behaviors and health-related quality of life

between Latina and Asian-American breast cancer survivors. Support Care Cancer. 2009;17(9):1137-47.

- 126. Austin LT, Ahmad F, McNally M-J, Stewart DE. Breast and cervical cancer screening in Hispanic women: a literature review using the health belief model. Women Health Iss. 2002 Jun 30;12(3):122-8.
- 127. Lange LJ, Piette JD. Personal models for diabetes in context and patients' health status. J Behav Med. 2006;29(3):239-53.
- 128. Sayegh P, Knight BG. Cross-cultural differences in dementia: The sociocultural health belief model. Int Psychogeriatr. 2013;25(04):517-30.
- 129. Vincent D. Culturally tailored education to promote lifestyle change in Mexican Americans with type 2 diabetes. J Am Acad Nurse Pract. 2009 Sep;21(9):520-7.
- 130. Lujan J, Ostwald SK, Ortiz M. Promotora diabetes intervention for Mexican Americans. Diabetes Educ. 2007 2007 Jul-Aug;33(4):660-70.
- 131. Barrera Jr M, Castro FG, Steiker LKH. A critical analysis of approaches to the development of preventive interventions for subcultural groups. Am J Community Psychol. 2011;48(3-4):439-54.
- 132. Chasan-Taber L, Fortner RT, Hastings V, Markenson G. Strategies for recruiting Hispanic women into a prospective cohort study of modifiable risk factors for gestational diabetes mellitus. BMC Pregnancy Childbirth. 2009;9:57.
- 133. Peterson RM, Beeson L, Shulz E, Firek A, De Leon M, Balcazar H, et al. Impacting obesity and glycemic control using a culturally-sensitive diabetes education program in Hispanic patients with type 2 diabetes. Int J Body Compos Res. 2010;8(3):85-94.
- 134. McCloskey JP. Promotores as Partners in a community-based diabetes intervention program targeting Hispanics. Fam Community Health. 2009 Jan-Mar;32(1):48.
- 135. Peña-Purcell NC, Boggess MM, Jimenez N. An empowerment-based diabetes selfmanagement education program for Hispanic/Latinos: A quasi-experimental pilot study. Diabetes Educ. 2011;37(6):770-9.
- 136. Rosal MC, Olendzki B, Reed GW, Gumieniak O, Scavron J, Ockene I. Diabetes selfmanagement among low-income Spanish-speaking patients: a pilot study. Ann Behav Med. 2005 Jun;29(3):225-35.
- 137. Riffe D, Lacy S, Fico F. Analyzing media messages: Using quantitative content analysis in research: Routledge; 2014.
- Harris JE, Gleason PM, Sheean PM, Boushey C, Beto JA, Bruemmer B. An introduction to qualitative research for food and nutrition professionals. J Am Diet Assoc. 2008;109(1):80-90.

- Centers for Disease Control and Prevention. State-specific trends in fruit and vegetable consumption among adults - United States, 2000–2009. Morb Mortal Wkly Rep. 2010;59(35):1125-30.
- 140. Caballero AE. Understanding the Hispanic/Latino patient. Am J Med. 2011 Oct;124(10):S10-S5.
- 141. Cohn DV. Census History: Counting Hispanics: Pew Research Center; 2010 Available from: http://www.pewsocialtrends.org/2010/03/03/census-history-counting-hispanics-2/.
- 142. Walter FM, Emery J, Braithwaite D, Marteau TM. Lay understanding of familial risk of common chronic diseases: a systematic review and synthesis of qualitative research. Ann Fam Med 2004;2(6):583-94.
- 143. Brown SA, Harrist RB, Villagomez ET, Segura M, Barton SA, Hanis CL. Gender and treatment differences in knowledge, health beliefs, and metabolic control in Mexican Americans with type 2 diabetes. Diabetes Educ. 2000 May-Jun;26(3):425-38.
- 144. Hatcher E, Whittemore R. Hispanic adults' beliefs about type 2 diabetes: Clinical implications. J Am Acad Nurse Pract. 2007;19(10):536-45.
- 145. Krippendorff K. Content analysis: An introduction to its methodology. Sage; 2004.
- 146. Commission on Dietetic Registration. Registration examination for dietitians test specifications 2007. Available from: https://www.cdrnet.org/certifications/registration-examination-for-dietitians.
- 147. National Certification Board for Diabetes Educators. Discipline requirement for certified diabetes educator 2014. Available from: http://www.ncbde.org/certification_info/discipline-requirement/.
- 148. Pew Research Center. Hispanic population in select U.S. metropolitan areas, 2011. Metropolitan Areas. 2011. Available from: http://www.pewhispanic.org/2013/08/29/hispanic-population-in-select-u-s-metropolitanareas-2011/.
- Siegel RL, Fedewa SA, Miller KD, Goding-Sauer A, Pinheiro PS, Martinez-Tyson D, et al. Cancer statistics for Hispanics/Latinos, 2015. CA Cancer J Clin. 2015 Nov 1;65(6):457-80.
- 150. Abram JK, Hand RK, Parrott JS, Brown K, Ziegler PJ, Steiber AL. What is your nutrition program missing? Finding answers with the guide for Effective Nutrition Interventions and Education (GENIE). J Acad Nutr Diet. 2015 Jan 1;115(1):122-30.
- 151. Schim SM, Doorenbos AZ, Miller J, Benkert R. Development of a cultural competence assessment instrument. J Nurs Meas. 2003;11(1):29-40.

- 152. Schim SM, Doorenbos AZ, Borse NN. Cultural competence among Ontario and Michigan healthcare providers. J Nurs Scholarsh. 2005 2005 4th Quarter;37(4):354-60.
- 153. Campinha-Bacote J. A model and instrument for addressing cultural competence in health care. J Nurs Educ. 1999;38(5):203-7.
- 154. Bernhard G, Knibbe RA, von Wolff A, Dingoyan D, Schulz H, Mosko M. Development and psychometric evaluation of an instrument to assess cross-cultural competence of healthcare professionals (CCCHP). PLoS One. 2015;10(12):e0144049.
- 155. Mareno N, Hart PL, VanBrackle L. Psychometric validation of the revised clinical cultural competency questionnaire. J Nurs Meas. 2013;21(3):426-36.
- 156. Haywood SH, Goode T, Gao Y, Smith K, Bronheim S, Flocke SA, et al. Psychometric evaluation of a cultural competency assessment instrument for health professionals. Med Care. 2014;52(2):e7.
- 157. Doorenbos AZ, Schim SM, Benkert R, Borse NN. Psychometric evaluation of the cultural competence assessment instrument among healthcare providers. Nurs Res. 2005;54(5):324-31.
- Burns KEA, Duffett M, Kho ME, Meade MO, Adhikari NKJ, Sinuff T, et al. A guide for the design and conduct of self-administered surveys of clinicians. CMAJ. 2008;179(3):245-52.
- 159. Rogers D. Compensation and benefits survey 2015. J Acad Nutr Diet. 2016 Mar 1;116(3):370.
- 160. Cooper LA, Roter DL, Johnson RL, Ford DE, Steinwachs DM, Powe NR. Patientcentered communication, ratings of care, and concordance of patient and physician race. Ann Intern Med 2003;139(11):907-15.
- 161. Hinkin TR. A brief tutorial on the development of measures for use in survey questionnaires. Organ Res Meth. 1998;1(1):104-21.
- Gerstein HC, Miller ME, Byington RP, Goff DC, Jr., Bigger JT, Buse JB, et al. Effects of intensive glucose lowering in type 2 diabetes. N Engl J Med. 2008 Jun 12;358(24):2545-59.
- Anderson-Loftin W, Barnett S, Bunn P, Sullivan P, Hussey J, Tavakoli A. Soul food light: culturally competent diabetes education. Diabetes Educ. 2005 Jul-Aug;31(4):555-63.
- 164. Hawthorne K, Robles Y, Cannings-John R, Edwards AG. Culturally appropriate health education for Type 2 diabetes in ethnic minority groups: a systematic and narrative review of randomized controlled trials. Diabet Med. 2010 Jun;27(6):613-23.

- 165. American Diabetes Association. 3. Foundations of care and comprehensive medical mvaluation. Diabetes Care. 2016 Jan 1;39(Supplement 1):S23-S35.
- Ruggiero L, Oros S, Choi YK. Community-based translation of the diabetes prevention program's lifestyle intervention in an underserved Latino population. Diabetes Educ. 2011;37(4):564-72.
- 167. Coleman KJ, Ocana LL, Walker C, Araujo RA, Gutierrez V, Shordon M, et al. Outcomes from a culturally tailored diabetes prevention program in Hispanic families from a low-income school Horton Hawks Stay Healthy (HHSH). Diabetes Educ. 2010;36(5):784-92.
- 168. Rosal MC, White MJ, Borg A, Scavron J, Candib L, Ockene I, et al. Translational research at community health centers: challenges and successes in recruiting and retaining low-income Latino patients with type 2 diabetes into a randomized clinical trial. Diabetes Educ. 2010 Sep-Oct;36(5):733-49.
- 169. Lorig KR, Ritter PL, González VM. Hispanic chronic disease self-management: a randomized community-based outcome trial. Nurs Res. 2003;52(6):361-9.
- 170. Davis RE, Peterson KE, Rothschild SK, Resnicow K. Pushing the envelope for cultural appropriateness does evidence support cultural tailoring in type 2 diabetes interventions for Mexican American adults? Diabetes Educ. 2011;37(2):227-38.
- 171. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. Qualitative Health Research. 2005 November 1;15(9):1277-88.
- 172. Benavides-Vaello S, Brown SA. Evaluating guiding questions for an ethnographic study of Mexican American women with diabetes. 2010;8(2):77-84.
- 173. Jezewski MA, Poss J. Mexican Americans' explanatory model of type 2 diabetes. West J Nurs Res. 2002;24(8):840-58.
- 174. Alcozer F. Secondary analysis of perceptions and meanings of type 2 diabetes among Mexican American women. Diabetes Educ. 2000 Sep-Oct;26(5):785-95.
- 175. Cabassa LJ, Hansen MC, Palinkas LA, Ell K. Azucar y nervios: explanatory models and treatment experiences of Hispanics with diabetes and depression. Soc Sci Med. 2008 Jun;66(12):2413-24.
- 176. Caperchione CM, Kolt GS, Mummery WK. Physical activity in culturally and linguistically diverse migrant groups to western society. Sports Med. 2009;39(3):167-77.
- 177. Guntzviller LM, King AJ, Jensen JD, Davis LA. Self-efficacy, health literacy, and nutrition and exercise behaviors in a low-income, Hispanic population. J Immigr Minor Health. 2016:1-5.
- 178. Campos C. Addressing cultural barriers to the successful use of insulin in Hispanics with type 2 diabetes. South Med J. 2007 Aug;100(8):812-20.

- 179. Ruggiero L, Glasgow R, Dryfoos JM, Rossi JS, Prochaska JO, Orleans CT, et al. Diabetes self-management. Self-reported recommendations and patterns in a large population. Diabetes Care. 1997 Apr;20(4):568-76.
- 180. Poss J, Jezewski MA. The role and meaning of susto in Mexican Americans' explanatory model of type 2 diabetes. Med Anthropol Q. 2002:360-77.
- Hansen M, Cabassa L. Pathways to depression care: Help-seeking experiences of lowincome Latinos with diabetes and depression. J Immigr Minor Health. 2012;14(6):1097-106.
- 182. Melancon J, Oomen-Early J, del Rincon LM. 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. Int J Health Educ. 2009;12:203-21.
- 183. Campbell R, Pound P, Pope C, Britten N, Pill R, Morgan M, et al. Evaluating metaethnography: a synthesis of qualitative research on lay experiences of diabetes and diabetes care. Soc Sci Med 2003;56(4):671-84.
- Clark L, Vincent D, Zimmer L, Sanchez J. Cultural values and political economic contexts of diabetes among low-income Mexican Americans. J Transcult Nurs. 2009 Oct;20(4):382-94.
- 185. Vaughan R, Cushman LF, Nye A. The New York City Community Outreach Study: biomedical and mental health status among a community sample of urban Hispanics. Ethn Dis. 2007 Winter;17(1):99-105.
- 186. West DS, DiLillo V, Bursac Z, Gore SA, Greene PG. Motivational interviewing improves weight loss in women with type 2 diabetes. Diabetes Care. 2007;30(5):1081-7.
- 187. Sue S. In search of cultural competence in psychotherapy and counseling. Am Psychol. 1998 Apr;53(4):440-8.
- 188. Brach C, Fraserirector I. Can cultural competency reduce racial and ethnic health disparities? A review and conceptual model. Med Care Res Rev. 2000;57.
- 189. American Association of Diabetes Educators. AADE position statement. Cultural sensitivity and diabetes education: recommendations for diabetes educators. Diabetes Educ. 2007 Jan-Feb;33(1):41-4.
- 190. Norman G. Likert scales, levels of measurement and the "laws" of statistics. Adv Health Sci Educ. 2010;15(5):625-32.
- 191. Dietvorst RC, Verbeke WJ, Bagozzi RP, Yoon C, Smits M, Van Der Lugt A. A sales force-specific theory-of-mind scale: Tests of its validity by classical methods and functional magnetic resonance imaging. J Mark Res. 2009;46(5):653-68.

- 192. Gadomski AM, Wolff D, Tripp M, Lewis C, Short LM. Changes in health care providers' knowledge, attitudes, beliefs, and behaviors regarding domestic violence, following a multifaceted intervention. Acad Med. 2001;76(10):1045-52.
- 193. McColl E, Jacoby A, Thomas L, Soutter J, Bamford C, Steen N, et al. Design and use of questionnaires: a review of best practice applicable to surveys of health service staff and patients: Core Research; 2001.
- 194. Resnicow K, Soler R, Braithwaite RL, Ahluwalia JS, Butler J. Cultural sensitivity in substance use prevention. J Community Psychol 2000;28(3):271-90.
- 195. Funnell MM, Anderson RM. Empowerment and self-management of diabetes. Clin Diabetes. 2004;22(3):123-7.
- 196. Ladhani Z, Stevens FJ, Scherpbier AJ. Does community health care require different competencies from physicians and nurses? BMC Med Educ. 2014;14(1):1-8.
- 197. Weller SC, Baer RD, Garcia de Alba Garcia J, Salcedo Rocha AL. Explanatory models of diabetes in the U.S. and Mexico: The patient–provider gap and cultural competence. Soc Sci Med. 2012;75(6):1088-96.
- 198. Renzaho AMN, Romios P, Crock C, Sønderlund AL. The effectiveness of cultural competence programs in ethnic minority patient-centered health care—a systematic review of the literature. Int J Qual Health Care. 2013;25(3):261-9.
- 199. Groetch ME, Christie L, Vargas PA, Jones SM, Sicherer SH. Food allergy educational needs of pediatric dietitians: A survey by the Consortium of Food Allergy Research. J Nutr Educ Behav. 2010 Jul-Aug;42(4):259-64.
- 200. MacLellan D, Morley C, Traviss K, Cividin T. Toward evidence-based, client-centred nutrition education guidelines: dietitian and consumer survey results. Can J Diet Pract Res. 2011 Aug 19;72(3):111-6.
- 201. Levine T, Hullett CR, Turner MM, Lapinski MK. The desirability of using confirmatory factor analysis on published scales. Commun Res Rep. 2006;23(4):309-14.
- 202. Anderson RM. Patient empowerment and the traditional medical model: a case of irreconcilable differences? Diabetes Care. 1995;18(3):412-5.
- 203. Ingram M, Ruiz M, Mayorga MT, Rosales C. The Animadora Project: identifying factors related to the promotion of physical activity among Mexican Americans with diabetes. Am J Health Promot. 2009;23(6):396-402.
- 204. Martyn-Nemeth PA, Vitale GA, Cowger DR. A culturally focused exercise program in Hispanic adults with type 2 diabetes a pilot study. Diabetes Educ. 2010 Mar-Apr;36(2):258-67.

- 205. Otilingam PG, Gatz M, Tello E, Escobar AJ, Goldstein A, Torres M, et al. Buenos habitos alimenticios para una buena salud: evaluation of a nutrition education program to improve heart health and brain health in Latinas. J Aging Health. 2015 Feb;27(1):177-92.
- 206. Millard AV, Graham MA, Wang X, Mier N, Sánchez ER, Flores I, Elizondo-Fournier M. Pilot of a diabetes primary prevention program in a hard-to-reach, low-income, immigrant Hispanic population. J Immigr Minor Health. 2011 Oct 1;13(5):906-13.
- 207. Dye JF, Schatz IM, Rosenberg BA, Coleman ST. Constant comparison method: A kaleidoscope of data. Qual Rep. 2000;4(1/2):1-9.
- 208. Toobert DJ, Strycker LA, Barrera M, Osuna D, King DK, Glasgow RE. Outcomes from a multiple risk factor diabetes self-management trial for Latinas: ¡Viva Bien!. Ann Behav Med. 2011;41(3):310-23.
- 209. Seliger J, Simons AL, Maida CA. Promotores-focused screening and education to improve diabetes awareness and self-care in low-income Latino intergenerational families. Int J Self Help Self Care. 2006;5(3):227-48.
- 210. Lipton RB, Losey LM, Giachello A, Mendez J, Girotti MH. Attitudes and issues in treating Latino patients with type 2 diabetes: views of healthcare providers. Diabetes Educ. 1998;24(1):67-71.
- 211. Torres RE. The pervading role of language on health. Health Care Poor Underserved. 1998;9(5):S21-S5.
- 212. Rodriguez J, Santibanez D, Christie C, Correa-Matos N. Latino Food Lover's Glossary: Florida Dietetic Association; 2009.
- 213. Hernández-Garbanzo Y, Griffin S, Cason KL, Loberger G, Williams J, Baker S, et al. A content analysis of nutrition education curricula used with low-income audiences: implications for questionnaire development. Health Promot Pract. 2013 July 1, 2013;14(4):534-42.
- 214. Pottie K, Hadi A, Chen J, Welch V, Hawthorne K. Realist review to understand the efficacy of culturally appropriate diabetes education programmes. Diabet Med 2013;30(9):1017-25.
- 215. Resnicow K, Jackson A, Braithwaite R, DiIorio C, Blisset D, Rahotep S, et al. Healthy Body/Healthy Spirit: a church-based nutrition and physical activity intervention. Health Educ Res. 2002 Oct;17(5):562-73.
- 216. Williams JH, Auslander WF, de Groot M, Robinson AD, Houston C, Haire-Joshu D. Cultural relevancy of a diabetes prevention nutrition program for African American women. Health Promot Pract. 2006;7(1):56-67.

- 217. Hawthorne K, Robles Y, Cannings-John R, Edwards A. Culturally appropriate health education for type 2 diabetes mellitus in ethnic minority groups (review). Cochrane Database Syst Rev. 2008 Jul 1.
- 218. Soto C, Unger JB, Ritt-Olson A, Soto DW, Black DS, Baezconde-Garbanati L. Cultural values associated with substance use among Hispanic adolescents in southern California. Subst Use Misuse. 2011 Jul 27;46(10):1223-33..
- 219. Allen JD, Leyva B, Torres AI, Ospino H, Tom L, Rustan S, et al. Religious beliefs and cancer screening behaviors among Catholic Latinos: implications for faith-based interventions. J Health Care Poor Underserved. 2014 May;25(2):503-26.
- 220. Mozaffari-Khosravi H, Jalali-Khanabadi BA, Afkhami-Ardekani M, Fatehi F, Noori-Shadkam M. The effects of sour tea (Hibiscus sabdariffa) on hypertension in patients with type II diabetes. J Hum Hypertens. 2009 Jan;23(1):48-54.
- 221. Betancourt JR, Green AR, Carrillo JE, Ananeh-Firempong O, 2nd. Defining cultural competence: a practical framework for addressing racial/ethnic disparities in health and health care. Public Health Rep. 2003 Jul-Aug;118(4):293-302.
- 222. Glanz K, Bishop DB. The role of behavioral science theory in development and implementation of public health interventions. Annu Rev Publ Health. 2010;31:399-418.
- 223. Carpenter CJ. A meta-analysis of the effectiveness of health belief model variables in predicting behavior. Health Commun. 2010;25(8):661-9.
- 224. Pham DT, Fortin F, Thibaudeau MF. The role of the health belief model in amputees' self-evaluation of adherence to diabetes self-care behaviors. Diabetes Educ. 1996;22(2):126-32.
- 225. Pinto SL, Lively BT, Siganga W, Holiday-Goodman M, Kamm G. Using the Health Belief Model to test factors affecting patient retention in diabetes-related pharmaceutical care services. Res Soc Admin Pharm 2006;2(1):38-58.
- 226. Powell CK, Hill EG, Clancy DE. The relationship between health literacy and diabetes knowledge and readiness to take health actions. Diabetes Educ. 2007 Jan 1;33(1):144-51
- 227. Berg BL, Lune H, Lune H. Qualitative research methods for the social sciences. Boston, MA: Pearson; 2004.
- 228. Sawyer MT, Deines CK. Missing the mark with Latina women with type 2 diabetes implications for educators. Diabetes Educ. 2013 Sep;39(5):671-8..
- 229. McEwen MM, Murdaugh C. Partnering with families to refine and expand a diabetes intervention for Mexican Americans. Diabetes Educ. 2014;40(4):488-95.
- 230. Goody CM, Drago L. Using cultural competence constructs to understand food practices and provide diabetes care and education. Diabetes Spectrum. 2009 Winter;22(1):43-7.

- 231. Heuer LJ, Hess C, Batson A. Cluster clinics for migrant Hispanic farmworkers with diabetes: perceptions, successes, and challenges. Rural Remote Health. 2006 Jan-Mar;6(1):469.
- 232. Hu J, Amirehsani K, Wallace DC, Letvak S. Perceptions of barriers in managing diabetes perspectives of Hispanic immigrant patients and family members. Diabetes Educ. 2013 Jul-Aug; 39(4): 494–503.
- 233. Kittler P, Sucher K. Food and Culture. Fourth Edition ed. Thomson, Toronto, CA: Thomson Wadsworth; 2004.
- 234. Centers for Disease Control and Prevention. Mental Health Home, Mental Health Basics, Mental Illness Depression 2013. Available from: http://www.cdc.gov/mentalhealth/basics/mental-illness/depression.htm.
- 235. National Institutes of Health. Complementary, alternative, or integrative health: What's in a name. National Institutes of Health, U.S. Department of Health and Human Services; 2015.
- 236. Cleveland LM, Horner SD. Normative cultural values and the experiences of Mexican-American mothers in the neonatal intensive care unit. Adv Neonatal Care. 2012 Apr;12(2):120-5.
- 237. Palmquist AE, Wilkinson AV, Sandoval JM, Koehly LM. Age-related differences in biomedical and folk beliefs as causes for diabetes and heart disease among Mexican origin adults. J Immigr Minor Health. 2012 Aug;14(4):596-601.
- 238. Brown SA, Blozis SA, Kouzekanani K, Garcia AA, Winchell M, Hanis CL. Health beliefs of Mexican Americans with type 2 diabetes: The Starr County border health initiative. Diabetes Educ. 2007 Mar-Apr;33(2):300-8.
- 239. Brown SA, Becker HA, Garcia AA, Barton SA, Hanis CL. Measuring health beliefs in Spanish-speaking Mexican Americans with type 2 diabetes: adapting an existing instrument. Res Nurs Health. 2002 Apr;25(2):145-58.
- 240. Hadwiger S. Acculturation and diabetes in a new Hispanic community. Hisp Health Care Int. 2005;3(3):133-42.
- 241. Heuer L, Lausch C. Living with diabetes: perceptions of Hispanic migrant farmworkers. J Community Health Nurs. 2006 Spring;23(1):49-64.
- 242. Hunt LM, Arar NH, Akana LL. Herbs, prayer, and insulin. Use of medical and alternative treatments by a group of Mexican American diabetes patients. J Fam Pract. 2000 Mar;49(3):216-23.
- 243. Weiler DM, Crist JD. Diabetes self-management in a Latino social environment. Diabetes Educ. 2009 Mar-Apr;35(2):285-92.

- 244. Centers for Disease Control and Prevention. The road to health toolkit. Atlanta, GA: US: Department of Health and Human Services, Centers for Disease Controland Prevention. 2010.
- 245. National Diabetes Education Program. National Diabetes Education Program: Guiding Principles for Diabetes Care for Health Care Providers and People With Diabetes. Bethesda, Md: National Institutes of Health; 1998. NIH publication 98-4343.
- 246. United States Department of Agriculture. Obesity Prevention & Healthy Weight Programs. National Institute of Food and Agriculture 2016. Available from: https://nifa.usda.gov/program/obesity-prevention-healthy-weight-programs.
- 247. National Center for Health Statistics. Chapter III: Overview of Midcourse Progress and Health Dispari es. Healthy People 2020 Midcourse Review. Hya sville, MD. 2016.
- 248. Lui PP. Intergenerational cultural conflict, mental health, and educational outcomes among Asian and Latino/a Americans: Qualitative and meta-analytic review. 2015 Psychological Bulletin (141): 404–446.
- 249. Kleinman A, Benson P. Anthropology in the clinic: the problem of cultural competency and how to fix it. PLoS Med. 2006 Oct 24;3(10):e294.