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PERCEPTIONS OF QUALITY OF LIFE OF LATINOS WITH DIABETES LIVING
IN THE U.S.: VARIATIONS BY GEOGRAPHIC REGION OF ORIGIN

by

Janice M. Long

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
Interdisciplinary Health Studies
Dr. Kieran Fogarty, Advisor

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Janice M. Long

TABLE OF CONTENTS

ACKNOWLEDGMENTS	ii
LIST OF TABLES.....	viii
CHAPTER	
I. INTRODUCTION.....	1
Background.....	1
Measurements of QOL in Latinos.....	5
General Studies of Health and Disease in Latinos.....	6
Methods.....	8
Significance of the Research.....	9
Research Questions.....	12
Research Hypotheses	12
Summary	13
II. LITERATURE REVIEW.....	14
Theoretical Framework.....	15
Background Measurement of Health	17
Quality of Life Measurement.....	20
Measuring QOL Using the ADDQoL.....	22
Diabetes and Its Impact.....	25
Latinos in the United States	28

Table of Contents—Continued

CHAPTER	
Latinos and Diabetes	29
Quality of Life Perceptions Across Latino Sub-groups	30
Latino Sub-Groups.....	32
Central American	34
South American	39
Mexican American.....	44
Puerto Rican.....	46
Variations in Health Across the Four Geographic Regions.....	48
Summary	51
III. METHOD	53
Project IDEAL	53
Survey Instrument.....	54
Reliability and Validity of the ADDQoL.....	55
Scoring the ADDQoL	56
Variables	57
Study Design.....	58
Subjects.....	58
Procedure	59
Method of Analyses	60
Statistical Analysis Applied to the Research Questions and Hypotheses	62

Table of Contents—Continued

CHAPTER

IV. RESULTS	65
Demographic Characteristics of the Population.....	66
Results Related to Research Question 1	72
Testing for Differences in Overall Quality of Life Across the Four Geographic Regions	72
Results Related to Research Question 2	76
Research Question 2	76
ADDQoL Sub-Domains for Latinos Using Principal Component Analysis.....	77
Principal Component Analysis for Examining the Individual Geographic Regions.....	79
V. DISCUSSION.....	88
Demographic Implications.....	90
Geographic Region of Origin, Age, Gender, and BMI.....	91
Education, Occupation, and Income	93
Years Living in the United States	96
Diabetes Duration and Co-Morbidities.....	97
Missing Data	99
Results of Research Question 1	99
Research Question 1	100
Research Question 2	102
Factor Analysis of the ADDQoL	103

Table of Contents—Continued

CHAPTER

Research Question 2, Part B	106
Comparison with Previous Research	109
Limitations	113
Implications for Provider Practice	114
Suggestions for Future Research.....	115
Summary	115
REFERENCES	117

APPENDICES

A. Comparison of Domains of Health Between Patient-Reported Health Instrument Recommendations and the ADDQoL	128
B. ADDQoL.....	130
C. Map of South/Central American, Mexico and Puerto Rico, and Study Population from Each	137
D. Human Subjects Institutional Review Board Letter of Approval	139
E. Permission Letters.....	141

LIST OF TABLES

1.	Geographic Region, Age, Gender, and BMI.....	67
2.	Marital Status.....	67
3.	Years of Education.....	68
4.	Occupation.....	69
5.	Population Count by Income Levels.....	70
6.	Years Living in the United States.....	71
7.	Years Since Diagnosis with Diabetes.....	72
8.	ANOVA and Differences in Means of Present QOL, Without Diabetes QOL and AWI ADDQoL by Geographic Region.....	75
9.	All Latinos-Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL $N = 297$	78
10.	Mexican American Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL $N = 209$	81
11.	Central American Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL $N = 21$	82
12.	Puerto Rican American Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL $N = 9$	84
13.	South American Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL $N = 58$	85
14.	Mean Values of Psychological Well-being, Physical Function, Social Well-being and Freedom to Drink for Latinos with Type 2 Diabetes by Geographic Region.....	86

List of Tables—Continued

CHAPTER

15. Regression Analysis of Physical Function, Psychological Well-being,
Social Well-being, and Freedom to Drink on Without Diabetes
Quality of Life (Question II)..... 87

CHAPTER I

INTRODUCTION

Background

According to the 2000 census, Latinos are now the largest ethnic minority in the United States. The Latino populations in the U.S. are diverse, originating from a variety of Latin American countries. These diverse origins contribute to diversity among the cultures, beliefs, and values of this relatively new immigrant population in the U.S., and may also influence the way Latinos experience type 2 diabetes and its limitations on living (American Diabetes Association [ADA], 2005).

Diabetes is a condition that requires lifestyle changes involving diet, exercise, regular visits to a healthcare provider, education, regular support, and other lifestyle modifications to the activities of daily living (ADA, 2008b). When type 2 diabetes is not controlled, it results in serious complications of vision loss, kidney failure, heart disease, stroke, limb amputations, and other serious consequences that include early death (ADA, 2008b). It is obvious then that an individual's life changes when diabetes is diagnosed. The changes in activities of life, including the limitations on activities and the risk for complications and death, may exert a grave effect on the individual who has type 2 diabetes (ADA, 2005; Botija, Lizan, Gosalbes, Bonet, & Fornos, 2007; Bzostek, Goldman, & Pebley, 2007).

Because Latinos are diverse, the variations in cultures, languages, and beliefs may influence the outcomes of their health care or diabetes education (Antshel, 2000; Botija et al., 2007). These variations may impact outcomes by influencing how they feel about their life quality once they have diabetes. Studies have shown that race/ethnicity and culture may influence quality of life (Bowling, 2005; Bradley & Corwyn, 2004; Eriksson, Nordstrom, Berglund, & Sandstrom, 2000; Fortin et al., 2006; Franklin et al., 2007; Huang et al., 2007; Molina, Zambrana, & Aguirre-Molina, 1994). Huang et al. (2007) found Latinos had a more negative impression of life with diabetes complications than non-Hispanic Whites or Blacks and postulated that these negative impressions of life would impact their willingness to comply with treatment and medication regimen. There are, however, deficits in the literature in broadly examining the impact of diabetes on quality of life among Latinos and their sub-groups.

Latinos have a high rate of type 2 diabetes, but they are not as likely to receive care for it as the non-Hispanic White population. When they do receive care, they are not as likely to receive the same quality of care (Smedley, Stith, & Nelson, 2003). Language may contribute to the lower quality, as trying to understand concepts about health or critical interventions requires a high level of understanding, and when a provider or educator cannot communicate in the language of the client, the client may miss some of the finer details that are as important as the diagnosis itself. Translation phone lines, using a family member to translate, or other measures may be helpful but may also place the client at risk for not receiving a clear education or medical advice message. It is important then for healthcare providers and educators to recognize the impact of these cultural implications and perceptions, because the way Latinos look at health and illnesses such as

diabetes may impact their life after a diagnosis of diabetes and may lead to poorer health outcomes that include life quality (Antshel, 2000).

The views Latinos hold regarding their life and health vary by cultural influences, their values, and by their beliefs and explanatory models about diabetes (Schouten, Meeuwesen, Tromp, & Harmsen, 2007). They may see diabetes in very different ways. Individuals who are more fatalistic in their beliefs may think there is little purpose in trying to modify lifestyle for a disease that is inevitable or brought on them by God (Franklin et al., 2007). Others who believe illness is caused by their sins may suffer deep depression or anxiety for sins committed. Still others who believe it is related to their lifestyle choices may feel they can rid themselves of type 2 diabetes by changing their life activities (Quinn, 2003). With the diabetes related modifications to lifestyle, the influence of language differences, and the various influences of cultural beliefs and values, Latinos may be less likely to follow through with treatment regimen or medications prescribed and ultimately experience poorer outcomes (Van den Brink et al., 2005).

Overall, little is known about the quality of life of Latinos who live with type 2 diabetes in the U.S. However, knowing how they perceive their life quality might offer insight to healthcare providers and educators who care for them. Thus, the question arises as to how diversity may impact the health outcomes and in particular quality of life.

This study examines data from the results of a quality of life instrument administered to Latinos with type 2 diabetes during a two-year interventional study from 2004 to 2006. The study was conducted by the principal investigator of the current study, as a secondary data analysis since the results had never been examined. The Audit for Diabetes Dependent Quality of Life (ADDQoL) was used as one method for measuring

health outcomes for the study and is the focus of the secondary analysis of the current study. Quality of life was chosen as an outcome for the original study as it was felt that the impact of diabetes on an individual's life might influence their perceptions of life quality. It was also felt that perceptions of quality of life might vary by the sub-groups participating in the study and that those who had poorer perceived quality of life might have poorer health outcomes. It was also felt that if healthcare providers and educators had access to knowledge about the differences in quality of life, it might influence their communicative behaviors with diverse populations of Latinos and hopefully improve patient adherence to treatment and lifestyle modifications necessary with diabetes. Therefore, measuring health outcomes like quality of life in Latinos with diabetes is important.

Measuring health outcomes is common practice in most healthcare systems, and it has been for many years (Agency for Healthcare Research and Quality, 2005; Bowling, 2005). It is often used as a means for understanding the impact of a specific disease, pathologic abnormality, or impairment on the human body, or for understanding the physical, mental, and social adaptation to a condition (Bowling, 2005). Health outcomes may also be used to determine quality of care measures for insurance providers, accreditation agencies, and/or for report cards to inform consumers. Regardless of the reason for measuring health outcomes, understanding the context within which individual responses are framed is important for healthcare providers and health educators (Agency for Healthcare Research and Quality, 2005; Bowling, 2005; Marquis & Buntin, 2006).

In the past, health outcome measurements were indicated by signs and symptoms or functionality changes with interventions or over time (Bowling, 2005). Since the

World Health Organization (1948) presented its definition of health as a “state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity,” health outcome measurements have changed. By this multi-dimensional definition, a health outcome may have a relationship to the symptoms or biological markers of illness as well as take into account the perception of physical, mental, and social well-being (Sundaram, 2007). As a result, the emphasis on health outcomes has changed to add these “more precious aspects of living” (Tann, 2005, p. 136) or quality of life (QOL) to the formula. Many QOL instruments are now available (Bowling, 2005; Bradley et al., 1999; Fitzpatrick et al., 2006; Joyce, Hickey, McGee, & O’Boyle, 2003) either as broad, generic assessments, or as disease-specific ones. A growing number are specific to diabetes, such as the ADDQoL (Bradley et al., 1999).

Measurements of QOL in Latinos

A plethora of literature can be found examining elements of QOL in people suffering with many chronic health conditions such as diabetes, cancer, heart disease, and HIV (Abraido-Lanza, Viladrich, et al., 2007; Bradley & Speight, 2002; Eriksson et al., 2000; Falcon & Tucker, 2000; Fortin et al., 2006; Hummer, Rogers, Amir, Forbes, & Frisbie, 2000; Padilla, Boardman, Hummer, & Espitia, 2002; Sorlie & Backlund, 1993). The impact of chronic conditions on life quality varies in part by how acculturation impacts health outcomes (Abraido-Lanza, Viladrich, et al., 2007).

General Studies of Health and Disease in Latinos

Studies examining the Latino population are often directed toward health status or disease states and a few examine the relationship of health conditions across sub-groups within the general Latino population (Anderson, Fitzgerald, Wisdom, Davis, & Hiss, 1997; Andres-Hyman & Ortiz, 2006; Araujo & Borrell, 2006; Bzostek et al., 2007; Carroll, Curtin, & Flegal, 2004) or related to quality of life of Latinos. Various authors suggest mortality in Latinos as a whole is lower than other racial or ethnic groups, despite barriers to healthcare in the population (Falcon & Tucker, 2000; Padilla et al., 2002; Hummer et al., 2000; Sorlie & Backlund, 1993).

Race/ethnicity, such as Latinos, and the degree of acculturation or Americanization may improve health outcomes related to exercise, as Latinos who are more acculturated tend to exercise more. Still, acculturation may prove detrimental to health conditions such as diabetes where high fat diets, smoking habits, and increases in body mass index (BMI) worsen with greater acculturation (Abraido-Lanza, Chao, et al., 2005; Fu & Kattan, 2006; Hajat, Lucas, & Kingston, 2000). Alegria, Sribney, Woo, Torres, & Guarnaccia (2007) found the risk of onset of psychopathology increased by age of immigration even when controlling for family social support and self-perception of good social position. This same study showed a protective effect in the birth country which was lost upon arrival in the U.S.

Lee et al. (2006) found the changes in family structure and the social networks in the U.S. contributed to alcohol consumption in Latino immigrants, and Abraido-Lanza, Chao, and Florez (2005) found some unhealthy behaviors, like alcohol consumption,

worsened with acculturation. Another study found that Latinos and their sub-groups who live in the U.S. and experience discrimination have poorer mental health (Araujo & Borrell, 2006), and mental health may impact perceptions of overall health or of life quality.

Although disease may impact Latinos from the various regions dissimilarly, there is no clear message of whether this makes a difference in life quality for Latino sub-groups, especially in those with diabetes. For example, Mexican-Americans and Cubans may have better health outcomes than other Latino sub-groups (Hajat et al., 2000; Zsembik & Fennell, 2005) such as Latinos from Puerto Rico. Another study suggests health outcomes may worsen with length of time in the United States for Puerto Ricans (Landale, Oropesa, & Gorman, 2000). Mexican American women have higher rates of obesity and type 2 diabetes that worsens with acculturation (Hartweg & Isabelli-Garcia, 2007). Having poorer mental or physical health outcomes for these sub-groups may suggest poorer quality of life; however, few studies discuss the relationship of quality of life and overall health outcomes. Latino groups such as those from South and Central America are mentioned less frequently in the literature (Zea & Garcia, 1997), and the impact of diabetes or other chronic diseases on their life quality is less clear than Mexican or Puerto Ricans.

This study is intended to shed light on the perceptions of quality of life of Latinos from four geographic regions of Latin America—Mexico, Central America, South America, and Puerto Rico—and determine if there are differences that exist in the way quality of life is perceived by Latinos from these four geographic regions. The results may be helpful for providers and educators who work with Latinos with diabetes to better

understand the Latino Diaspora and to apply the knowledge to improve cultural sensitivity in care.

Methods

With the growth and the diversity of the Latino population, and the inherent risk for diabetes associated with being Latino (ADA, 2005), there is a need to understand the population and the quality of life of Latinos from the various geographic regions of Latin America. In so doing, Latinos with diabetes may have an improved likelihood for positive health outcomes (Schouten et al., 2007).

This descriptive, comparative study attempts to examine the way Latinos from various geographic regions view their life quality when they live with type 2 diabetes. The instrument used for the assessment of life quality is the ADDQoL. The study examines life quality both generally among Latinos as one group, and by the four geographic regions of North, Central, and South American continents and Puerto Rico. Furthermore, the study examines life quality by the sub-domains of the ADDQoL, which are social and psychological well-being, physical functioning, and the ability to drink.

The study used a secondary data analysis obtained from the diabetes-specific QOL survey (ADDQoL). The ADDQoL was developed as a diabetes-specific instrument to identify the impact of diabetes treatment and complications on quality of life (Bradley et al., 1999). The instrument was administered over a two-year period (2004 to 2006) to participants screened through Project IDEAL (Initiative for Diabetes Education Advancement for Latinos), a community-based participatory study conducted at

Kennesaw State University, WellStar School of Nursing. The study was approved through the Human Subjects Institutional Review Board of the investigating university.

Significance of the Research

The study examined the QOL of Latinos with type 2 diabetes who reside in the U.S., and who originate from the four geographic regions as described by Zea and Garcia (1997)—South and Central America, Mexico, and Puerto Rico. The theoretical framework that guided the research was Madeline Leininger's (1991) *Culture Care Diversity and Universality*. The theory formed the basis for recognizing the differences between the healthcare provider and the client in terms of views of the world, including social structure, language, ethno history, and environmental context (Leininger, 1991). The framework further provided the foundation for working with and respecting the diversity of the participants from the four geographic origins. The significance of this study involved the understanding of the differences and commonalities in perceptions of quality of life across Latino sub-groups. The results can then help providers better understand these differences and commonalities among Latinos to assist them in obtaining improved health outcomes.

The Latino population is now the largest ethnic minority in the United States (U.S. Census Bureau, 2006). Projections suggest the Latino population growth in the U.S. may reach 17.3% of the total population by the year 2020 (Mocroft, Ledergerber, & Katlama, 2003). This growing immigrant population in the U.S. consists of diverse Latino sub-groups such as Puerto Ricans, Colombians (South American origin), Mexicans (North American origin), and Guatemalans (Central American origin). There are

commonalities that can be found by geographic region. For example, Latinos living in the South American region, including Colombia, Venezuela, and Ecuador, have some similarities in language, foods, and culture; there are also unique variations, some of which include differences in religious and spiritual beliefs, beliefs about life and death, explanatory models of health and illness, and the way families relate to each other (Antshel, 2000; Dinneen, 2001; Molina et al., 1994; U.S. Department of State, 2008; Wallace, 1986). Many of the values and beliefs that may influence perceptions of health and life are handed down from generation to generation (Andres-Hyman & Ortiz, 2006; Vidrine, Amick, Gritz, & Arduino, 2003).

Not only do the various cultures, values, and beliefs influence perceptions, but linguistic variations also play a role. For example, the Maya living in the U.S. South and Southwest are known to have many Mayan dialects. In coming to the U.S., they are first exposed to a Mexicanization—adapting to the Mexican American culture in the U.S. (Casteneda & Manz, 2002) before they acculturate as Americans. Without this extra step in the process, the Maya may not be able to communicate with other Maya who may speak any one of their 23 dialects and may be isolated by language. The first step they take is learning to speak Spanish (Casteneda & Manz, 2002). Spanish is spoken in 63% of the Latino homes in the U.S., though the Pew Report (Pew Hispanic Center, 2006) indicates that by the second and third generation living in the U.S., many of the children know very few Spanish words and the dominant language in the home is English. Data from the Pew Hispanic Center reported for 2006 showed that more Mexican Americans (50.1%) and South Americans (63.9%) under 18 years of age spoke English very well in their homes compared to the Central Americans (43.4%). For those over 18 years of age,

Central Americans had about 25%, Mexican Americans approximately 20%, and South Americans 30% who spoke English very well in the home (Pew Hispanic Center, 2006). With older Latinos, the gap in those who know English very well and practice it regularly is much lower, making older groups of Latinos and especially many older Mexican Americans in need of more translational support when receiving care or education.

An earlier study documented accommodation for language and culture must be incorporated into the strategies for administering surveys or questionnaires, such as when administering QOL for Latinos (Deyo, 1984). For example, in administering surveys such as the ADDQoL or the Sickness Impact Profile conducted by Deyo (1984), Latinos may be less familiar with taking part in questionnaires as well as with research in general, leading to how seriously they took the instrument.

This particular study used the Spanish version of the Audit for Diabetes Dependent Quality of Life (ADDQoL) (Bradley & Speight, 2002). The ADDQoL was validated and tested for reliability in English-speaking subjects in England and is discussed in greater detail in Chapter III. According to the ADDQoL author (Dr. Clare Bradley), further testing conducted in Spain brought similar results, though these results are not available presently through a literature search. Studies have been conducted comparing the Spanish version of the ADDQoL with other validated instruments such as the COOP/WONCA functional assessment charts, and results showed a high reliability (Bentsen, Natvig, & Winnem, 1999). The comparison found no significant differences at baseline and 6 months (Botija et al., 2007) between the two instruments.

The diversity of the Latino population manifests in varying levels of risk for chronic diseases such as diabetes (ADA, 2006; Hajat et al., 2000). One in every 10

Latinos is at risk for developing type 2 diabetes. This rate varies by country of origin, with 1 in every 4 Mexican-Americans at risk, while people from Puerto Rico have a slightly higher risk for the disease with 1 in less than 4 at risk for diabetes (ADA, 2006). Although the risk for a disabling disease such as diabetes is high among Latinos, the population is less likely to have access to quality care (Smedley et al., 2003). Thus, with the growing Latino population in the U.S., and with the barriers to culturally sensitive health care and education, important questions emerge in relation to Latino sub-groups and quality of life.

Research Questions

The research study will answer the following questions:

1. Are there differences in perceptions of quality of life of Latinos with type 2 diabetes across the four geographic regions using the Audit for Diabetes Dependent Quality of Life (ADDQoL)?
2. Are there constructs or domains of the ADDQoL that predict quality of life in the Latino population and its sub-groups who are living in the United States and have type 2 diabetes?

Research Hypotheses

This research study will test the following null hypotheses:

Hypothesis 1: Among Latinos who live in the U.S. and have type 2 diabetes, there are no significant differences in perceptions of quality of life across four geographic regions using the Audit for Diabetes Dependent Quality of Life (ADDQoL).

Hypothesis 2: Among Latinos who live in the U.S. and have diabetes, there is no significant association between the constructs or domains of the ADDQoL that predict quality of life in the Latino population and its sub-groups.

Summary

The Latino population in the U.S is now the largest ethnic minority. Latinos living in the U.S. are diverse in ethnic origins and in their culture and beliefs. Many have limitations in English language use. Latinos also have a high prevalence of type 2 diabetes, which places them at high risk for the serious complications of the disease. With the growth in the population and the high prevalence of diabetes, it is important that healthcare providers and educators understand the population and how they view diabetes and its impact on their lives. Understanding their differences and their commonalities could improve the quality of life for those who receive care and ultimately might improve health outcomes.

CHAPTER II

LITERATURE REVIEW

Databases used in the literature search for the study included Ebsco Host databases: (1) Academic Search Complete, (2) CINAHL, (3) Medline, (4) SocINDEX, (5) Sociological Collection, (6) PsychINFO, and (7) Psychology and Behavioral Science Collection. The review of literature revealed a plethora of studies related to quality of life (over 160,000 articles), and quality of life and diabetes (over 2,000 articles were found). When the search term *quality of life and Latinos* was added, the number of articles narrowed to 134, and with *quality of life of Latinos and diabetes*, only 4 articles were found. Also included in the literature search were the following terms:

Health and South Americans (134);

Quality of life and South Americans (2);

Health and Central Americans (83);

Quality of life and Central Americans (3);

Health and Mexican Americans (902);

Quality of life and Mexican Americans (24);

Health and Puerto Ricans (20);

Quality of Life and Puerto Ricans (1).

The review of the literature is divided into five major areas: (1) Theoretical Framework, (2) Measurement of Health, (3) Quality of Life Measurement, (4) Diabetes and Its Impact, and (5) Quality of Life Perceptions Across Latino Sub-groups.

Theoretical Framework

Culture Care Diversity and Universality theory was derived from cultural anthropology (J. A. Cohen, 1992), and while the theory is considered a nursing theory, its application reaches far beyond one specialty area to providers of care in all health disciplines. The underpinnings of the current research are founded on the Culture Care Diversity and Universality theory of Dr. Madeline Leininger. Dr. Leininger defines culture as “the learned, shared, and transmitted values, beliefs, norms, and lifeways of a particular group that guides their thinking, decisions, and actions in patterned ways” (Leininger, 1991, p. 47). Through the use of the Leininger theory of Culture Care Diversity, the quality of life of Latino individuals is examined by looking at the collective group to gain understanding in how to provide culturally effective care to a member of the group. Through culturally effective care, quality of care might improve and a resultant improvement of quality of life anticipated.

According to Leininger (1991), the knowledge of meanings and practices that result from the views of the world, the social structure, cultural values, language, and environment of Latinos is necessary to provide culturally congruent care. Leininger’s theory suggests there are universalities and diversities that should be considered in planning and delivering care to diverse populations. She states that cultural migrations from anywhere in the world should stimulate new lines of thinking and action and enable us to realize the power of cultural groups in modifying their own social, economic, and political structure, including those who have been oppressed (Leininger, 1991; Rajan, 1995).

Providers and educators may be challenged to work with and care for people from politically oppressed countries, victims of war or terrorism, or those from countries with famine and isolation, which has been the experience of some immigrants from Latin America. Dr. Leininger's theory of Culture Care Diversity and Universality suggests that nurses and healthcare providers working with victims of such disasters must recognize that considering the person alone is not enough; influences of family, communities, social networks, environmental and political factors must be considered (Leininger, 1991).

Examining populations with attention to their commonalities and differences provides opportunity for caregivers to greatly expand their worldview to provide culturally congruent care and education.

As Dr. Leininger's theory posits, there are commonalities and variations among people of the world, and caregivers who work with an individual must consider the influences of the group from which they originate, their family, their community, or their country, and the culture and social factors that contribute to their perceptions of life. The theoretical framework fits well with the purpose of the study to reveal insights regarding the QOL of Latinos who have type 2 diabetes and who belong to one of four geographic regions being studied. Each research question sought to determine whether there were differences or commonalities (the Universalities and Diversities) in the perceptions of QOL in Latino sub-ethnic groups who live in the U.S. and have diabetes, and whether any of the diversities of QOL constructs predict life quality.

Background Measurement of Health

The measurement of QOL is a dynamic process encompassing multiple dimensions of well-being (Bowling, 2005). It is subject to a wide range of perceptions, as those who are evaluated for life quality may live with multiple chronic diseases and varying levels or severity of illness. QOL is considered the sum of physical, social, and emotional factors and may include objective dimensions (Bowling, 2005). When diabetes is out of control physiologically and vision is lost or complications occur, life quality may also be altered to a greater degree than with normal life changes of diabetes care routines. The degree of effect may be influenced by multiple factors, including psychological, social, or physical factors and cultural values and beliefs (Caldwell, Baxter, Mitchell, Shetterly, & Hamman, 1998). How one feels about the loss of physical function or the added burdens on daily activities imposed by diabetes may have a direct impact on perceptions of quality of life.

The concept of reducing an individual's happiness or quality of life to a numeric value is not new. In about 1789, Jeremy Bentham, a British philosopher, described his method of quantifying happiness with life with his felicific (happiness-making) calculus (Bentham, 1789). Bentham believed one could determine his/her likelihood for happiness by considering the degree of pleasures and the absence of pain or suffering. Bentham's formula takes into account the intensity, duration, likelihood, and extent of both pleasures and pains as the measure (outcome) could be used for consideration of large groups of people (Bentham, 1789).

Measuring health outcomes are common place today in many healthcare settings and have been for several years (ADA, 2008b; Bowling, 2005). Through outcome reporting, validation of the quality of care provides support in continuing service delivery for healthcare agencies and providers. Insurance companies may use health outcome measures to determine the degree of risk and whether coverage is offered (Marquis & Buntin, 2006). Healthcare institutions use them to show how practice standards are met (Agency for Healthcare Research and Quality, 2005). Researchers use health outcome measures to establish equality or inequalities of care (Kelley-Moore, 2006). Increasingly, consumers use the criteria to choose a provider or hospital for their care-seeking health services from the facility with the lowest level of mortality or morbidity (Mullaney, 2005). While the health outcome industry measures offer a basis for funding and service provision by the health care agency or provider, it may not reflect how the care provided actually impacts the life of the consumer of healthcare services.

In general, these measures are objective data produced with a negative view. The indicators are specific to illness events, morbidity, mortality, hospital admission rates, and emergency room utilization rates (Bowling, 2005) and look to determine whether these deleterious events occur more or less frequently across healthcare settings. Markers of disease—the signs and symptoms of morbidity—are also used and include frequencies or rates of the objective measures by site or area. As an example, biological markers such as blood pressure levels, body mass index, blood glucose levels, Hemoglobin A1c, and lipids (ADA, 2008b) are some of the more commonplace measures in programs geared toward diabetes care and management. While there is a need to see the patient meet certain biological markers, for example, have a blood pressure in a certain range, or other

blood values to measure diabetes control, there is no consideration given to subjective input—how the patient feels about the values.

The objective data can provide a general idea of how the population fares under a particular health system's or provider's care. The measures, however, have limitations. For example, they are limited by inaccuracies in provider test procedure, by types of lab methods for analysis and equipment used, and by the policies and procedures of individual provider practices (Bowling, 2005). More importantly, they are limited in that they do not consider how the person who provides the evidence for the measures, experiences them (Bowling, 2005). For example, measures that identify quality outcomes for diabetes are established by the Diabetes Quality Improvement Project (DQIP), which sets seven accountability criteria that include percentages of patients who meet each of the criteria (McLaughlin, 2000) and includes a questionnaire for satisfaction with care. The questionnaires do not include a quality of life measure.

Examining only biological measures without consideration of the way the individual feels about life may not be adequate as a determinant of a provider or agencies ability to provide care. Some patients may live a productive and happy life even with chronic illnesses, while others may feel hopeless once a diagnosis of a chronic disease is made (Fortin et al., 2006). A case in point is the 10-year Danish 1905 study (Nybo et al., 2001) of over 2,000 Europeans (men born around 1905) between the ages of 70 and 89 who experienced chronic disabilities. The study revealed that participants with self-rated positive health had lower mortality risk despite varying levels of disability compared to those who did not rate their health positively (Van den Brink et al., 2005). The variability in self-rated health and the impact on mortality were also evident in the study. Not only

do these findings help to establish the foundation for including the patient's perceptions of life quality when considering health outcomes, but there is also the potential for improving the patient's response to treatment by recognizing and considering his/her perceived life quality and acknowledging the impact of that perception on overall health outcomes.

The U.S. Department of Health and Human Services, Food and Drug Administration also became involved in the process (Bradley, 2006) to offer guidance for the use of QOL measurements in medical product development. The term *patient-reported outcome* (PRO) was identified as the term of choice by the Food and Drug Administration (FDA) (Bradley, 2006). Regardless of the label assigned to the construct, measuring quality of life must consider how the individual who owns the life feels about it (Joyce, 1994). Therefore, while the measurement of life quality seeks to quantify the self-reported quality of life, a highly subjective measurement, it is the unique subjective response or the individual's perceptions that produce a valuable measure for quality of life outcome evaluation.

Quality of Life Measurement

Over the past 30 years, a vast array of instruments provides a sampling of health outcome measures (Bowling, 2005; Bradley et al., 1999; Chavez et al., 2005; Varma, Wu, Chong, Azen, & Hays, 2006). The tools vary by generic or disease-specific types and by nomenclature. The measures include the use of terms such as *health status*, *health-related quality of life*, *functional status*, *patient-reported outcomes*, or often just *outcomes* (Fitzpatrick et al., 2006). The common element of these instruments is the intent to

capture the patient's experience with chronic illnesses that affects 6 out of 10 people (Fitzpatrick et al., 2006). In 2006, the Food and Drug Administration (FDA) of the U.S. convened a conference and invited experts or professionals interested in the field of patient-reported outcomes (PRO) to work on a plan for standardizing medical outcome instruments and to make recommendations for PRO uses in medical product development to support labeling claims (FDA, 2006). This group developed draft guidance for developing the instruments and additionally listed the measures needed to assure the validity and reliability of the instruments used in medical product labeling. The FDA group did not make specific recommendations for instruments already developed.

In England, a similar effort took place beginning in the 1990s, where broad-based instruments PROs and disease-specific instruments (Fitzpatrick et al., 2006) were considered for their quality for use in medical outcomes reporting. One of the disease-specific areas for health outcome instruments was that of diabetes. Of the six generic instruments identified by the work group in England, the only recommendation was for the SF-36 (Short Form 36) instrument for use in people with diabetes. The group considered six diabetes-specific instruments, of which one was the Audit of Diabetes-Dependent Quality of Life (ADDQoL). After examining all the data from studies available with the six diabetes specific measures of QOL, the group concluded that there was insufficient evidence to support the recommendation of any one particular disease-specific QOL instrument, although there was interest in three, one of which was the ADDQoL. The expert group felt the ADDQoL warranted more attention to establish the case for a disease-specific instrument recommendation (Fitzpatrick et al., 2006).

The use of a generic instrument may not capture perceptions of quality of life related to diabetes and its complications; therefore, a diabetes-specific instrument is needed. Bradley et al. (1999), developers of the ADDQoL, suggest that methods for measuring QOL in people with diabetes cannot be narrowed into the same categories as many other diseases and still have meaningful results. The Los Angeles Eye Study supported the concept by finding that the SF-12 had a weak relationship to patient-reported quality of life compared to a low-vision-specific instrument (Varma et al., 2006).

While the SF-36 is useful in examining well-being across diseases, it lacks in the ability to measure life quality within a disease such as diabetes (Anderson et al., 1997; Hill-Briggs, Gary, Baptiste-Roberts, & Brancati, 2005). Diabetes, the treatment regimen, or the responsibility for self-management of diabetes may affect life quality, and factors associated with these elements must be considered (Singh & Bradley, 2006).

In developing an instrument to measure QOL in diabetes, Singh and Bradley (2006) described the importance of including measures that are specific to the disease to gain insight into how the disease impacts the individual's perception of life quality. An example of a treatment requirement for people with diabetes is the change in what they can eat or drink. Eating has a social function in the U.S., and the limitation of food or certain beverages may seriously change how one feels about life. The SF-36 and other generic QOL instruments do not include questions that assess factors such as diet.

Measuring QOL Using the ADDQoL

The instrument selected for the current study is the ADDQoL developed by Bradley et al. (1999) at the Royal Holloway University of London, Surrey, England. The

ADDQoL development was influenced by the interview measure, the SEIQOL (Schedule for the Evaluation of Individual Quality of Life), a generic, individualized quality of life scale (Browne, O'Boyle, McGee, McDonald, & Joyce, 1997). The ADDQoL, like the SEIQOL, works within the value system of the person being assessed and not that of the assessor (Joyce et al., 2003). The ADDQoL also takes into consideration whether the particular domains are important to the person being assessed and applies a weighting to the score as does the SEIQOL. Through the weighting process, the items that have greater importance to the individual score higher than the items that have lower importance. Through this manner of weighting, the final score of the QOL adjusts for domains that have higher or lower importance values to the individual being assessed (Bradley et al., 1999; Browne et al., 1997).

The ADDQoL early version had 13 items and development included discussions with diabetes health care professionals and patient interviews (Bradley et al., 1999). The British Diabetic Association/Royal College of Physicians Working Group and patients with diabetes reviewed the instrument. Additional items were added to extend the ADDQoL's relevance to people with complications of diabetes (Bradley et al., 1999). The ADDQoL 19-item instrument used in the current study resulted from the original version with the additional items added (see Appendix B). One weakness of the instrument is the lack of sub-groupings into physical, social, or emotional domains. Each question of the 19-item survey is an independent domain as the instrument is currently designed.

The 18-item version of the survey (an earlier version than the one used in the current study) was evaluated for reliability and validity at the Royal Holloway University of London in the United Kingdom, as noted above, and was found to be statistically

reliable with a Cronbach's alpha of .92, indicating high reliability with the English speaking population (Bradley & Speight, 2002). Reliability is concerned with whether an instrument is internally consistent or reproducible. Reliability estimates are recommended to be 0.7 to 1.0 for instruments used for groups and individuals, respectively (Fitzpatrick et al., 1998). For instruments that are used to make decisions about patient care and treatment or for research, a reliability estimate of .9 to 1.0 is recommended (Nunnally & Bernstein, 1994). Validity is whether a measurement tool measures what it claims to measure (Jacobson, 1997). Construct validity of the ADDQoL was examined by Woodcock, Julious, Kimmonth, and Campbell (2001) with type 2 diabetes patients and compared an 11-item version of the ADDQoL with the SF-36. The study found the ADDQoL and the SF-36 complementary. Internal consistency of the ADDQoL using an item-total correlation was 0.37–0.67 and a Cronbach's alpha of 0.84 (Garratt, Schmidt, & Fitzpatrick, 2002). Evaluated against clinical variables for criterion-related validity, Bradley et al. (1999) found the scores of the ADDQoL-13 item version of the survey statistically, significantly correlated with perceptions of hypoglycemia ($r = .32$) and the number of reported complications ($r = 0.21$). The differences found were significant in 7 of the 13 dimensions of the instrument (Fitzpatrick, Bowling, et al., 2006).

The ADDQoL, the 19-item instrument used in the current study, had no published studies reporting data reduction to sub-domains to measure broadly the psychological, physical, or social impact of life quality. For the purpose of the current study, a factor analysis was conducted using principal component analysis to identify the sub-domains. It was thought knowing the sub-domains would be useful in caring for patients with type 2 diabetes, because sub-domains might simpler to view and more useful as a clinical tool. It

was also thought that physical domains of quality of life might have a greater impact on perceptions of quality of life, since numerous restrictions for activities of daily living are impacted by having type 2 diabetes. It was also believed that the psychological or emotional factors might impact overall quality of life, since people who were more confident, more motivated, or more hopeful about their future (items of the 19 items of the ADDQoL) might do better with self-management of diabetes and have a better quality of life than individuals with low psychological scores. It was also believed that how Latinos perceive their quality of life generally might offer insight for providers and educators who work with Latinos in health education or care settings.

Diabetes and Its Impact

Perceptions of quality of life vary among people who suffer with chronic diseases (Abraido-Lanza, Viladrich, et al., 2007; Fortin et al., 2006) like diabetes, even when the condition carries serious complications and morbidities. It is important for providers to recognize both the way the condition is perceived as well as the physical impact of the disease.

Diabetes occurs when there is either a loss of insulin production as in type 1 diabetes or a relative loss as in type 2. Type 2 diabetes results from a developing resistance of the cells of the body to the insulin produced (ADA, 2008b). Type 2 diabetes accounts for 90 to 95% of all people with diabetes and is the focus of the current study. Type 2 diabetes occurs most frequently in adults over 20 years of age, though it is increasingly common among children and adolescents who are overweight or who have a family history of the disease. The symptoms of type 2 diabetes, such as fatigue, thirst,

frequent urination, and slow healing sores, can be difficult to spot and often the condition develops unnoticed for years before it is diagnosed. As a result, persons with type 2 diabetes often learn they have the condition when they are diagnosed with a complication (ADA, 2008b).

Diabetes alters the life of the individual who has the condition as well as the lives of their families. Complications of diabetes include stroke, heart attack, kidney failure, vision loss, and amputation (ADA, 2006). Through medical and self-management interventions, individuals who have diabetes can prevent or postpone the development of diabetes complications. Medical management and education for diabetes self-management based on the American Diabetes Association's Education Recommendations (ADA, 2008a, 2008b) can assist and prepare those affected to learn healthy lifestyle behaviors.

Diabetes is in epidemic proportions globally. This epidemic is spurred on in part due to population growth, but also due to an increasing urbanization, an aging population, and an increasingly obese population with sedentary life styles (Wild, Roglic, Green, Sicree, & King, 2004). In 1993, the World Health Organization (WHO) estimated the prevalence of diabetes (all types) in participating countries to be approximately 171 million and likely to exceed 336 million by the year 2030 worldwide (King & Rewers, 1993). In 2003, another study conducted by the International Diabetes Federation (IDF) found there were 194 million people living with diabetes globally. Of the 194 million reported by the IDF, approximately 85–95% involved type 2 diabetes in developed countries, with North America having the highest prevalence (IDF, 2003).

In the United States, nearly 21 million have diagnosed diabetes (ADA, 2005). The condition is primarily one of adults over the age of 20, but recent studies in the U.S. show a rise of type 2 diabetes among children that parallels the growing rate of obesity in children (Carroll et al., 2004). Over the decade of the 1980s to the 1990s, there was also a decrease in the mean age of diagnosis of diabetes in the U.S. from 52 years of age in 1988 to 1994, down to 46 years of age in 1999 to 2000 (Koopman, Mainous, Diaz, & Geesey, 2005). Increased incidence of obesity and growing populations who are at-risk for diabetes are also considered factors in diabetes development in the adult population.

While the prevalence rates reported here are high, there may be an equal number of people who are undiagnosed. The U.S. Public Health Service and the American Diabetes Association actively promote awareness, prevention, and early detection of the disease to accurately track and treat the growing condition that is particularly high among the Latino population (ADA, 2005; Centers for Disease Control [CDC], 2006).

Trends show the prevalence of diagnosed diabetes has been on the rise for several years. From 1976 to 1980, 3.4% of the population was diagnosed (Harris et al., 1998); by 1999–2000, the rate had increased to 5.9% of the adult population (Wild et al., 2004). The growth in diabetes prevalence is of particular concern because of the serious complications that accompany uncontrolled diabetes. In 2007, diabetes was listed sixth among the leading causes of death in the country (ADA, 2008b). Maintaining and improving health-related quality of life in people with diabetes is a goal of the U.S. Public Health Department, with interventions to promote healthy behaviors and prevent diabetes and to help people with diabetes better manage their condition and prevent complications (CDC, 2006). These health promotion efforts are directed toward all U.S. citizens, but

some groups, like Latinos, may be less likely to gain access to the services (Smedley et al., 2003), and without health services, risk for poorer health-related quality of life increases (Fortin et al., 2006).

Latinos in the United States

The U.S. has long been a land of hope and plenty for people from countries with high poverty levels like Mexico or other war-torn countries, like countries in Central and South America, but over the last decade, the growth in the Latino population has soared over 50% above that of the 1990 census figures (U.S. Census Bureau, 2000). Migration from Latin American countries contributes in large part to the changing demographics of the U.S. (U.S. Census Bureau, 2000). In the 2000 U.S. Census, the Latino population replaced African Americans to become the largest ethnic minority in the United States. Latinos have become an important and dynamic component of the U.S. culture and society (Casteneda & Manz, 2002).

Latinos come to the U.S. for many reasons. The U.S. is a place for political asylum for those who are under oppressive governments, such as the Mayans from Guatemala, fleeing political unrest or violence from drug trafficking wars, such as in Colombia (Burns, 1993; Casteneda & Manz, 2002; de Roux, 1991). Others relocate to be with family, and still others for temporary or permanent work (J. H. Cohen, 2001). The Latino populations living in the U.S. who are American citizens contribute to the population growth, having one of the highest birth rates among all race and ethnicities and exceeding that of the Black or White population (Sutton & Matthews, 2006). Of the Latinos who come to the U.S., some have legal documentation, while others come

surreptitiously without documentation (Casteneda & Manz, 2002). This clandestine growth poses challenges, such as keeping accurate records for the delivery of healthcare services to the population.

Latinos and Diabetes

In parallel with the Latino population growth, the diabetes prevalence rate in the U.S. also increased. The emerging Latino immigrant population suffers undue risk for type 2 diabetes, presenting a threat to individuals, families, and communities (ADA, 2005; Quinn, 2003; U.S. Census Bureau, 2000). The risk of type 2 diabetes in the Latino population is one of the highest of all racial and ethnic groups in the U.S. population, coming in third after the African American and American Indians/Alaska Native population (ADA, 2005). Within the Latino populations, the prevalence of diabetes varies by sub-ethnic group (Christensen, 1975; Cleghorn, et al., 2004), suggesting that prevalence rates in Puerto Ricans in the study were 13.7%, while Dominicans were 9.1% (Cleghorn et al., 2004). According to the National Health and Nutrition Examination Survey (National Center for Health Statistics [NCHS], 2004) 1 in 10 (10%) Mexican Americans have diabetes (Harris et al., 1998). Another study in El Paso, Texas (ADA, 2000) found 16.5% of Mexican Americans living in El Paso County had diabetes. According to the ADA (2005), 24% of Mexican Americans and 26% of Puerto Ricans between the age of 45 and 74 years of age, and about 16% of Cubans suffer from diabetes. In addition to a high prevalence of diabetes and dissimilarities in diabetes risk, there are also variations in perceptions of self rated-health and perceptions of life quality (Fortin et al., 2006; Franklin et al., 2007).

Latinos who have diabetes are more likely to have negative perceptions of quality of life than are non-Latinos, and these feelings may reflect beliefs about health, illness, and treatment that may impede their willingness to engage in treatments or medication regimen (Huang et al., 2007). The study, conducted with 650 participants, had White, Black, and Latinos in the population. Latinos had the lowest complication rates compared to White or Black participants; however, Latinos and Blacks were more likely to report difficulties and worries with their medications than were Whites in the study (Huang et al., 2007). It is therefore important to understand Latino values and beliefs as they relate to health. While there is a growing body of literature that discusses the Latino population from the various Latin countries, gaining an understanding of where they originate may bring insight and a foundation for understanding and impacting treatment options.

Quality of Life Perceptions Across Latino Sub-groups

Despite a growth in the number of studies that focus on quality of life over the past few years, few address QOL in the Latino population with diabetes. The prevalence of diabetes in the U.S. has reached epidemic proportions, and the prevalence of diabetes in Latinos is also high (ADA, 2005). Results of the literature review of QOL in Latinos by geographical region were rare; however, studies discussed in this section include those identified by health and Latino/a search phrases. The studies included are those related to health outcomes or quality of life measurement by region or by country.

As much as disease impact varies among racial/ethnic groups or sub-groups and in particular among disparate/marginalized populations such as the new immigrant Latino population (Eriksson et al., 2000; Hajat et al., 2000; Vidrine et al., 2003), perceptions of

disease and health may vary. Some groups may see disease as though it is inevitable, some may see it preventable, some may feel it is caused by God or for sins committed, and others may see it as a personal result of life choices (Baquet & Hunter, 1995; Falicov, 1996; Guo & Phillips, 2006; Molina et al., 1994; Ross, Mirowski, & Cockerham, 1983). The view of disease origins may be influenced by the diverse unique cultures of Latinos from the different regions of the world and can play a role in the outcome of disease (Abraido-Lanza, Viladrich, et al., 2007), depending on the degree of acculturation, as well as how life quality is perceived in the face of a chronic illness and cultural or spiritual beliefs (Franklin et al., 2007; Kazarian & Evans, 2001).

Although poorer outcomes in health-related outcomes suggest poorer outcomes in health-related QOL, one study showed that health outcomes may also be better for Latinos with certain chronic diseases. Padilla et al. (2002) and Hummer et al. (2000) suggest mortality in Latinos is lower than other groups for some conditions, even though barriers to healthcare in the population abound. Falcon and Tucker (2000) found that being Latino may offer some protection against depression and anxiety. The study suggested strong family support protected some Latinos from the effects of depression and anxiety, and having an external locus of control provided still further reductions of anxiety. Still other studies suggest that there are differences in the way chronic disease affects people from the various Latin countries. Tucker, Falcon, Bianchi, Cacho, and Bermudez (2000) found that Puerto Ricans and Dominicans have significantly higher prevalence of disability associated with self-reported chronic health conditions than do non-Hispanic Whites. In the same study, Puerto Ricans were found to have higher levels of disability than all other groups (Tucker et al., 2000). For example, Mexican Americans

and Cubans may have better health outcomes than other Latino sub-groups (Hajat et al., 2000; Zsembik & Fennell, 2005), such as Latinos from Puerto Rico. Little information on health and health-related quality of life is available for Latinos from other Latin American regions (Zea & Garcia, 1997).

Latino Sub-Groups

Immigrants to the U.S. who participated in the current study came to the U.S. from many countries in South America, Central America, Mexico, and Puerto Rico (for map of the area, see Appendix C). To understand the culture and beliefs that influence perceptions of life quality of the study participants, it is helpful to have a basic understanding of the history of the people and their beliefs and why they may be either similar or different. Leininger (1991) suggested the view of their ethnohistory and their environment might provide a framework for delivering culturally congruent care.

The next section will attempt to cover some of the key factors that could influence perceptions by country and geographic region. The countries discussed here include those represented by the participants of Project IDEAL, and the geographic regions considered are those regions that are home to the specific countries of origin of the population. The discussion that follows will describe the four geographic regions in greater detail and attempt to show the similarities and differences of the regions.

People of Latin American ancestry may have more differences than commonalities, but their differences may be more evident by region and culture (Baquet & Hunter, 1995; Hyman, 1966; Mirowsky & Ross, 1984). Studies of people originating from Latin countries as a whole are few, as most studies report findings based on people

from one region or one country (Andres-Hyman & Ortiz, 2006). One study addressing Latinos as a whole was conducted in 1998 and covered a time period that spanned 8,000 years (Bogin & Keep, 1999). The study used various reports and publications of data from Latin countries for its analysis that showed declines in stature using anthropometry since the 1500s. The study showed the influence of the economic, social, and political condition in the region of Latin countries and the influence on mean stature of the population for the late 19th and 20th centuries (Bogin & Keep, 1999). While this one study may not represent the entire population of Latinos, it covered a broad segment of Latinos over time and may show trends that are meaningful for the whole population. Body size may have little to do with perceptions of quality of life, but it is presented here as a point to consider since the way one feels about his or her stature among other immigrant regions could influence self-perceptions of health or life quality. Chavez et al. (2005) suggested that when assessing quality of life, it is important to recognize the varied cultural and contextual settings that influence quality of life experience.

The largest immigrant population in the Southeastern U.S. is Mexican American (U.S. Census Bureau, 2006). Approximately 58% of the Latinos in the U.S. are of Mexican origin, and, as a result, more studies focus on this group (Cohen, 2001; Mendelson, 2003). The population of Latinos in the U.S. is also increasing secondary to immigrants from other regions of Latin America (Wallace, 1986), and is represented in the current study. Many individuals come from Central and South America, settling, in particular, in urban areas (Pew Hispanic Center, 2006). Researchers studying Latinos in Southern California suggest immigrants from the various geographic regions differ by mean age, length of time in the U.S., gender, where they are more likely to settle (rural or

urban settings), and the human capital (education or skills and abilities) they bring to the workforce in the U.S. (Wallace, 1986). A closer look into the background of the people and the region of the world from which they immigrate may prove useful and consistent with Leininger's theory that understanding the populations and their beliefs and learning more of their worldviews and their environment may help improve their health outcomes and life quality (Chavez et al., 2005).

Central American

Central Americans are essentially Spanish-speaking and of Mestizos (mixed Amerindian and either English or Spanish) ancestry and are predominantly Roman Catholic (U.S. Department of State, 2008). Seven countries are included in the Central American region. The seven countries of Central America are Nicaragua, Honduras, Costa Rica, El Salvador, Guatemala, Panama, and Belize. Participants in the current study originate from only five of the countries: Nicaragua, Honduras, El Salvador, Guatemala, and Belize.

In the current study, some of the participants from Central America immigrated to the U.S. as refugees of political unrest and civil wars. Three countries represented were El Salvador, Nicaragua, and Guatemala. The literature noted that individuals from these countries often sent their sons to the U.S. to avoid the forced military service in either government or rebel forces (Leslie, 1993). Central Americans are more likely to come with post-traumatic stress disorders and depression than other immigrants who come for other reasons (Leslie, 1993). Central American immigrants who are exposed to the trauma of war are likely to be mistrusting and have identity confusion and isolation, a

finding that has also been seen in U.S.-born Americans exposed to trauma (Alexander & Lupfer, 1987; Asner-Self & Marotta, 2005).

Central Americans think of their family in expansive ways like other Latino immigrant families (Falicov, 1996). Blood relatives, regardless of how distant, are included in the definition of the family. In immigrating to another country, these family ties are disrupted at least temporarily until the immigrant either returns home or brings some family to live in the U.S. This transition period may result in further psychological implications, such as anxiety and depression (Leslie, 1993), much like other Latino groups experience.

A study conducted by Wallace (1986) compiled information comparing Central Americans to Mexican Americans in California in the 1980s. The study found that immigrants from Central America who immigrate to the U.S. are more likely to be educated with greater than a sixth-grade education than Mexican Americans. The study also reported that Central American immigrants were more likely to learn to speak English and to remain able to speak it (Wallace, 1986). Wallace also found that Central Americans were more likely to be older than the Mexican immigrants. Wallace felt this due to the fact that Central Americans had a lower birth rate than the Mexican American population. Wallace also found that Central Americans had a larger population over the age of 64 than Mexican American groups.

Another study conducted by Hartweg and Isabelli-Garcia (2007) found that living in the U.S., experiencing the trials of life in a country different from one's native country, may contribute to Central American women not thinking of themselves as being healthy. The women in the study felt that not having a chronic disease was being healthy, but

within the same group they also described one could have a chronic disease and still feel happy (Hartweg & Isabelli-Garcia, 2007). Participants in the study were Spanish-speaking only and were less likely to be acculturated than participants in other studies of Hispanic women (Hartweg & Isabelli-Garcia, 2007).

Immigrants from Guatemala, El Salvador, Belize, Nicaragua, and Honduras, all Central American countries, are included in the current study. For this reason, information about the native countries of these participants is included in the following pages. Costa Rica and Panama have no representatives in the current study and are not discussed here.

Guatemalan

Guatemala is a small region of Central America, smaller than the size of Tennessee. Though it is small, Guatemala is home to almost 13 million people made up of Mestizos (mixed Amerindian Spanish, called Ladino locally) and European (59.4%). The other 40.1% also in the population are Mayan groups of K'iche (9.1%), Kaqchikel (8.4%), Mam (7.9%), Q'eqchi (6.3%), and other Mayan (8.6%) (World Atlas, 2008). Spanish is the primary language of Guatemala (60%), with Amerindian languages making up the other 40% (23 officially recognized Amerindian languages, including Quiche, Cakchiquel, Garifuna, and Xinca). Religions of Guatemala are predominantly Roman Catholic, but also include Protestant and indigenous Mayan beliefs. Guatemala's per capita annual income in 2007 was about \$5,400 (U.S. Department of State, 2008).

Approximately 80% of the Maya of Guatemala participate in a tradition that is common in other Central American countries, the use of medicinal plants (Michel et al.,

2007). The plants are used because of their economical and culturally suitable treatment of certain health conditions. Since 2001, the Ministry of Health in Guatemala has recognized traditional Mayan medicine as a formal system of health care in the country (Michel et al., 2007). A study conducted in Guatemala examining the herbal medicines used for treatment of women's health complaints found support for the traditional use of the plants studied (Michel et al., 2007).

The Mayan belief includes a perception that man is composed of body, spirit, heart, and shadow. Being healthy requires having a balance of these four aspects of man. An imbalance of these components causes illness. Psychological illnesses are thought to be related to spirit loss. Women are seen as weaker than men (Michel et al., 2007).

El Salvadorean

According to the data from the U.S. Department of State (2008), El Salvador is a small country with just under 21,000 sq km. The population, which nears 7 million, is made up of Mestizo (90%), White (9%), and Amerindian (1%). The mean income per capita in El Salvador in 2007 was \$5,200. El Salvador adopted the U.S. dollar in 2001; however, the economy there remains sluggish. Spanish is the official language of El Salvador. About 83% of the population is Catholic, with the other 17% belonging to other religious beliefs (U.S. Department of State, 2008); 79.7% of the population can read and write (Whyte, 2003). Over the past decade, large populations of Salvadorians immigrated to Southern California and New York, as well as to other large cities around the U.S. (Whyte, 2003).

Belizean

Belize is smaller than Guatemala and has a population of close to 300,000, making it the most sparsely population country in the Central American region (U.S. Department of State, 2008). The population is made up of Mestizo (48.7%), Creole (24.9%), Maya (10.6%), Garifuna (6.1%), and other (9.7%). Roman Catholicism is the primary religion, with Protestants secondary. Languages include Spanish (46%), Creole (32.9%), Mayan dialects (8.9%), English (3.9%) (official), Garifuna/Carib (3.4%), German (3.3%), and other (1.4%) (World Atlas, 2008). English is the official language and is spoken by virtually all except the refugees who arrived over the last 10 years. Due to tourism, Belize has an annual per capita income of about \$7,800.

Agriculture is a primary industry in Belize. Foods of Belize are primarily the staples of corn, beans, rice, wheat, beef, pork, and poultry. Bananas, cane sugar, and citrus are primary exports and are readily available. There are no food taboos, but soups and fruit juices are thought to promote health (U.S. Department of State, 2008).

A two-level society is apparent in Belize, with skin color indicating the level of social class. The darker skinned groups, Creole and Garifuna, are the poorest populations in the country and have the highest unemployment (U.S. Department of State, 2008).

Nicaraguan

Nicaragua is a small country about 120,000 sq km in size. It has a population of almost 6 million. The population is made up of primarily Mestizo (mixed Amerindian and White) (69%), White (17%), Black (9%), and Amerindian (5%). Spanish is the

official language, with Miskito and English also being common. Most (about 73%) are Roman Catholic, with 15% Evangelical and 1.5% Moravian (World Atlas, 2008). The per capita income in 2007 was about \$3,200, making Nicaragua the poorest country in Central America. It is also the lowest ranking in literacy levels at only about 67.1% of the population (Whyte, 2003).

Honduran

Honduras is much larger than the other countries in the region of Central America, with approximately 58,000 sq km and a population of over 7.5 million. The population is made up of about 90% Mestizos (mixed Amerindian and European), Amerindians (7%), Black (2%), and White (1%). Hondurans are 97% Roman Catholic and 3% Protestant. The mean per capita income in 2007 was \$3,300. Spanish is the dominant language of Honduras, but numerous Amerindian dialects are also common. Literacy rates are about 80%.

South American

Another geographical region from which participants of the study originated was South America. South America is the fourth largest continent (6,880,000 sq mi) in the Western Hemisphere (World Atlas, 2008) and has a population of over 360 million. South America is divided politically into 12 independent countries: Argentina, Bolivia, Brazil, Chile, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela. The people of South America are diverse. The countries of the region have influence from Spain, Europe, Germany, and the native Amerindian tribes. Approximately 80% of

South Americans are Christian, with 81% Catholic and 9% other Christian denominations. Economic and social inequalities create an environment of political unrest. Immigrants come to the U.S. from all South American countries. Of the 12 countries in the South American continent, the 5 which have immigrants in the current study will be discussed. Study participants from South America are from Colombia, Venezuela, Ecuador, Argentina, and Brazil.

Colombian

Colombians enjoy freedom of religion and are predominantly Spanish-speaking but have over 60 other dialects practiced among the aboriginal Colombians. People of Colombia have a national health insurance that was established in 1993 that provides for health for all. Providers are subsidized under the government to provide access to care for the poorest people.

Colombians love a variety of foods, but differences in the way people eat vary by their economical status. The rich in Colombia are more likely to have more problems with overeating and the poor with malnutrition. Initiatives over the last few years have focused on eating more fruits and vegetables to improve the lifestyles and reduce the rising obesity epidemic in the country (Caez Ramirez & Casas Forero, 2007). Popular foods in Colombia include seafood, poultry, beef, and pork, but the country is also rich in tropical fruits and vegetables (U.S. Department of State, 2008).

Per capita income for Colombians in 2007 was \$7,200, but a wide gap in income creates a class of severe poverty and a climate of political and economic unrest in the country. Guerilla and paramilitary movements, along with private justice and vendettas,

as well as violations of human rights occurred in Colombia when the government and institutions could not meet the needs of the people (de Roux, 1991). Services such as sewer, trash collection, or transportation in the large cities were missing, and political promises did not fulfill their commitments. A cultural crisis resulted and drug trafficking became a mainstream activity and provided the resources in many cases that the government could not provide for the very poor of the country. A climate of violence was followed by a “dirty war,” where atrocious massacres occurred regularly between 1988 to 1990 (de Roux, 1991). Many Colombians who had resources sought political asylum out of the country during this time period.

Approximately 750,000 Colombians live in the U.S. About 60% of Colombians living in the U.S. have a college education, and 10% have post-graduate degrees (U.S. Census Bureau, 2000).

Venezuelan

Venezuela shares many cultural similarities to Europeans (Spanish, Italian, German), Brazilians, and Mexicans. The people of Venezuela are predominantly descendants of Europeans, indigenous Venezuelan Amerindians, and African slaves brought in by slave trade. Venezuela shares religion commonalities and foods with Colombia, though beef has been the pride of the country. Concerns about health have changed the diet of many in the country over the past few years to consume more fish and chicken (Dinneen, 2001). A variety of coffee flavors are important to Venezuelan diets, as are the abundant tropical fruits that make fruit drinks a mainstay in the Venezuelan diet (Dinneen, 2001).

About 95% of Venezuelans can read and write in the Spanish language, and most are Roman Catholic. Per capita income in 2007 was \$12,700, but poverty is still a major concern for the country. Healthcare, funded by the Social Security System in Venezuela, is available for all, and the healthcare infrastructure is the most advanced in Latin America. Venezuelans in the U.S. settle primarily in a region near Miami, Florida, but also have immigrated to New York and California.

Family and extended family play a central role in the support and assistance individual Venezuelans require in life. These close-knit relationships incorporate cousins and more distant relatives in a circle of support that may extend not only to emotional and loving support, but to financial aid or employment assistance. The *compradrazgo*, the godparents, for children in families continues to be an active practice among Venezuelan families and creates a wide network of relationships. Venezuelan girls are considered women at age 15 when they have their first coming-of-age parties. An old tradition less likely to be seen today, since funeral homes and mortuaries have taken over the care of the dead, is the practice of families preparing the body of their own dead and arranging the wakes and funerals themselves (Dinneen, 2001).

Since the 1980s and 1990s, crime is more prevalent in large Venezuelan cities, creating fear and impacting social life of the inhabitants (Dinneen, 2001).

Ecuadoreans

Ecuador's population is the most diverse, with a largely Metizos (a combination of Amerindians and Spanish ancestry) population. An economic crisis and corrupt politics forced many immigrants from Ecuador to European or Asian countries or the U.S. About

950,000 Ecuadoreans live in the U.S., primarily in New York City and other large metropolitan regions. The primary language of Ecuador is Spanish. Another common language is Quechua, the primary dialect of the Amerindians. The foods, like those of Colombia and Venezuela, are high in seafood, vegetables, and tropical fruits and juices. About 92% of the population can read and write. Per capita income for Ecuador in 2007 was \$7,100 (U.S. Department of State, 2008).

Argentinian

Argentina is one of the largest countries in South America with a population of over 40 million. Nearly 97% of the population are White, mostly Spanish and Italian, Mestizos of mixed Amerindian and White ancestry make-up, Amerindian and other non-White groups make up the other 3%. Argentinians are mainly Roman Catholic (92%, with less than 20% practicing), Protestant (2%), and Jewish (2%), with the final 4% practicing other religions. The official language of Argentina is Spanish, but also common are English, Italian, German, and French. Over 97% of the population over the age of 15 can read and write. The per capita income in 2007 for Argentinians was \$13,000.

Brazilian

Brazil has a population of around 190 million and occupies 8.5 million sq km of land. The population is primarily White (53%), 38.5% Mulatto (mixed White and B), 6.2% Black, and .9% other. The official language of the country is Portuguese, but Spanish, English, and French are also spoken there. Roman Catholicism is the primary religion (73.6%), with Protestant (15.4%), Spiritualist (1.3%), Bantu/voodoo (0.3%), and

other (1.8%) represented. There are some (7.4%) who also state that have no religious beliefs. Over the age of 15, over 80% of the population can read and write. The per capita income for Brazil was \$9,700 in 2007 (U.S. Department of State, 2008).

A wide variety of customs emanate from the diversity of Brazil's population, and one custom of the Kagwahiv Amazon tribe relates to how death and mourning is handled. Families who suffer a loss to death do not speak the name of the deceased as it was, but change the name after their death. They also do not look at photos of the deceased and dispose of the utensils from which they ate, as well as change the house in which they lived, sometimes tearing down the house and rebuilding it. These customs have to do with protecting the living from supernaturally dangerous spirits, as well as in honoring the dead. Mourners of this tribe may not eat or sing for several days after the death of a loved one and may give away many of the articles of possessions of the dead family member (Kracke, 1988). While the cultural activities that surround the Brazilian dead may not influence QOL after immigration to the U.S., being aware of the way Brazilians see life and death is an important part of understanding the population. Individuals who have suffered losses in their lives and who carry some of the beliefs mentioned here may not respond the same when their own life or the life of another is threatened. It is therefore important to understand such traditions.

Mexican American

The largest group of participants in the study originate from Mexico. Mexico occupies a space of just under three times the size of Texas with 1,972,550 sq km. The population is about 98.5 million, made up of Mestizo (Amerindian-Spanish) (60%),

Amerindian or predominantly Amerindian (30%), White (9%), and other (1%). The primary language of Mexico is Spanish, but also with various Mayan, Nahuatl, and other regional indigenous languages. Among Mexican Americans, almost 90% of the population practice Roman Catholic beliefs, while about 6% are Protestant. About 90% can read and write their native language. The per capita income in Mexico in 2007 was \$12,700 (U.S. Department of State, 2008).

Mexicans born in Mexico may be more likely to live in Mexican enclaves within communities in the U.S. and to cling to their language and culture of the parent country (Bankston, Hidalgo, & Rasmussen, 2006). Children born to these immigrants are influenced by the American culture through public schools and various media sources. They may be more likely to reject their cultural foundations, and by the third generation (children born in the U.S. of parents born in the U.S.) may be more acculturated than their parents so are more apt to have mainstream American values and attitudes and reject their cultural origins (Bankston et al., 2006). Another hypothesis, however, is that with a culture of honoring diversity that prevails in the past few years, more Mexican Americans may retain their original cultural beliefs across generations to a greater degree (Bankston et al., 2006).

Mexican Americans believed in the concept of *respeto* that explains their belief in respect for others and an expectation to be respected. Mexican Americans take care of their own and are caring and respectful of their elders (Guo & Phillips, 2006). Trust is also very important for Mexican American elders. They are not likely to talk about their illnesses other than to discuss how it affects their families, even to their healthcare

providers. They will be polite to their providers and show respect but are apt to do what they wish when they return home (Guo & Phillips, 2006).

Many see illness as a natural process and, if the symptoms are not severe, do not want to see a healthcare provider. They also see the disease as a *susto* or caused by their fear. They often believe that illness is the result of a divine cause and there is little one can do about it (Guo & Phillips, 2006).

Puerto Rican

Of the over 300 participants in the current study, only 10 are from Puerto Rico. Puerto Ricans have a higher degree of rights as citizens of the U.S., which may have influenced the number who took part in the study. Participants in Project IDEAL were largely referred by a free clinic where over 75% of the population were Latinos who were uninsured or underinsured. Puerto Ricans were more likely to be fluent in English and thus have jobs where they were more likely to have health insurance. Even though there was a large population of Puerto Ricans in the area of the study, few sought care from the clinic or from the free services of Project IDEAL. There are more studies examining the health and health outcomes of Puerto Ricans than any of the other groups except Mexico.

Puerto Rico is an island in the Caribbean. It is 35 miles wide and 100 miles long with a population of 2.8 million. The population density is greater than that of China, Japan, or India. Puerto Ricans are American citizens and consist of Africans, Spaniards, and, to a lesser degree, Taino Indians. The Taino Indian culture continues to have an influence on the culture of Puerto Ricans. Puerto Ricans may be light skinned to dark

skinned due to the influence of the various ancestral beginnings. Puerto Ricans' per capita income in 2007 was \$19,000 on the island.

On the U.S. mainland, Puerto Rican populations concentrate in large urban areas, in particular, in New York City; Hartford, Connecticut; and several cities in New Jersey (Hidalgo, n.d.). Puerto Ricans living on the U.S. mainland are often second and third generation on the mainland and may be referred to as New (Neo) Puerto Ricans. The Neo Puerto Ricans differ from those born and raised in Puerto Rico (Christensen, 1975). One key difference is they usually prefer English to Spanish for communication. Neo Puerto Ricans also differ among other characteristics learned through acculturation to the U.S. inner-city environments where many are concentrated. Another notable difference described in a study of Puerto Rican births, both on the U.S. mainland and on the island, suggests that the longer Puerto Ricans have lived in the U.S., the greater the assimilation to the U.S. culture, the poorer the birth outcomes (Landale et al., 2000).

While there are differences across the two Puerto Rican groups (mainland and island), they share many cultural commonalities as those born and living in Puerto Rico. The love of and valuing of family, and, especially the demonstration of love and tolerance for children, are common in both groups. Likely a result of this value, Puerto Ricans do not frown upon illegitimacy. Families may be large, with mixed groups of children, nieces, nephews, and godchildren within them and even may include children of the husband's alliances with a mistress (Christensen, 1975). The large families, the *compadrazgo* (godparent) relationship, and social life of the Puerto Ricans, as well as the hospitality of the group, are common and not lost in groups living in the U.S. for years (Silen, 1971).

Specific values and traits generally agreed on as Puerto Rican are *fatalismo*, *respeto*, *dignidad*, *machismo*, and *humanismo*, and *afecto* (Christensen, 1975). These traits, defined below, may play considerable role in how Puerto Ricans view their health and the experience of facing a chronic disease.

- Fatalismo—the concept of fatalism.
- Respeto—respect for authority, family and tradition.
- Dignidad—dignity but related closely to respeto. In opposing others, never take away that person's dignity.
- Machismo—male superiority, implying inferiority of women. Machismo may be acted out through fighting and sexual conquest.
- Humanismo—humanism.
- Afecto—affect. Affect refers to the ability to be warm and demonstrative.

These characteristics and traits of the Puerto Rican population contribute to how health, illness, and life quality are viewed, such as the belief that illness is inevitable. It is important for healthcare providers to consider them when providing care, education, or counseling (Christensen, 1975).

Variations in Health Across the Four Geographic Regions

Variations in health status and risk can be seen across Latinos from the various regions. A study conducted in 2000 by Hummer et al. found Puerto Ricans had the highest mortality rate and Central and South Americans had the lowest. Mexican Americans, Cubans, and other Hispanics and Anglos displayed an about equal overall mortality risk that fell halfway between the Puerto Ricans and Central and South

Americans (Hummer et al., 2000). The study also found a lower overall risk for circulatory disease and cancer mortality among Mexican Americans, and Central and South Americans. It further found differences in the populations in age, socioeconomic status, nativity, region of residence, percentage living in central cities, time since immigration, healthcare use, and health behaviors contributing to overall and age-specific mortality, as well as variation in the risk of specific cause of death by group. The findings of the Hummer et al. (2000) study support the theory of diversity and a need for considering the diversity in administering surveys for quality of life or outcome measures and in working with clients from Latin sub-ethnic groups (Hummer et al., 2000).

Zsembik and Fennell (2005) conducted a descriptive study using the National Center for Health Statistics published in 2004 as the data source for 129,596 participants. The study examined whether health differences among Latino sub-groups arose from sub-group differences in health determinants. The study looked at the predictions of health outcomes by sub-group membership. The study found that ethnic variations account for differences in health outcomes across the Latino sub-groups. Mexican Americans had a distinct advantage with the cultural beliefs and values that worked as a buffer to protect them from the potential outcomes of disease. Mexican Americans fare better overall in chronic disease than do other Latino sub-groups and acculturation moderates the advantage (Zsembik & Fennell, 2005).

Another study examining locus of control found that Mexican Americans as a whole were more likely than Anglos to have an external locus of control (Mirowsky & Ross, 1984). The study conducted by Mirowsky and Ross in 1984 reported that, combined with low income, the Mexican heritage contributed to greater distress and

depression, with Mexican Americans believing that external influences control the meaningful experiences and events in life. The study also revealed that even though having an external locus of control produced the negative consequence of depression, the depression was not typically pathologic and was counterbalanced by a reduction in anxiety. The reduced anxiety was thought to be reinforced also by having the external locus of control, free of the worry of fault (Mirowsky & Ross, 1984). By placing the cause of things that happen to them outside their own control or responsibility, Hyman (1966) suggests this may help to reduce their distress and protect their self-esteem. Mexican Americans, however, have strong social support among family and friends, and this strong network may also contribute to relief of anxiety, further balancing out the depression (Mirowsky & Ross, 1984).

One study using a Parkinson's disease Quality of Life instrument examined the mental health of patients from Ecuador with Parkinson's disease to determine the relationship of mental health to quality of life. The study found that overall perception of patients' health status was strongly influenced by their mental health and less so by their physical condition. Both mood and functional situation were viewed as determinants of health-related quality of life (Hobson, Holden, & Meara, 1999). Another study of Ecuadorean populations was conducted with women who were post-menopausal and participating in a metabolic syndrome screening study. Findings from the study suggested QOL was negatively impacted by hyperglycemia, hypertension, and obesity. (Chedraui et al., 2007).

The BRFSS (Behavioral Risk Factor Surveillance System) data were used to analyze the HRQOL of Puerto Ricans living in Puerto Rico. The BRFSS is the world's

largest ongoing health survey that is conducted by telephone and began in 1984 (CDC, 2008). BRFSS surveys are conducted in all 50 states in the U.S., the Virgin Islands, Puerto Rico, and Guam. The BRFSS data reporting the HRQOL of Puerto Ricans living on the island were obtained between 1996 and 2000; a total of 13,686 people were surveyed. Approximately 34% of the population reported fair or poor health. Younger adults were more likely than older adults to report mentally unhealthy days. Fewer reports of unhealthy days were reported by respondents with higher education, employment, and income than those with less education, unemployed, or low incomes. Also important was that exercise and not smoking was related to having fewer unhealthy days. People with diabetes had significantly more unhealthy days than people without diabetes (CDC, 2008).

Summary

In summary, limited published scientific studies were available for examination of Latino culture and beliefs and their influence on quality of life in diabetes. Much of the published literature examined the Mexican American population, who represent the largest ethnic minority in the U.S., but studies discussing the other three regions were lacking. As a result, the literature review included demographic makeup of the countries of origin of the four regions taken from papers presenting the history or geography of the regions.

In keeping with Madeline Leininger's theory of Culture Care Diversity, which formed the conceptual framework of this current study, it is helpful to understand the individual country demographics and the social, emotional, environmental, and political

conditions that contribute to the values and beliefs of the individuals whose origins were the Latin American regions discussed.

Measurement of quality of life is known to offer outcome data that examine an area of impact of illness and health that is not captured by the more common measures used, the lab values or biophysical data. To examine the impact of quality of life for Latinos, a secondary analysis of ADDQoL was used. The ADDQoL gives information on both the impact and the importance of diabetes related treatment and complications. The reliability and validity of the instrument have been studied and found excellent for conducting the current study.

Diabetes affects the lives of the individual, the family, and the community, and in some may have a larger impact than on others. Beliefs and values may influence how diabetes and its limitations on life are perceived by people from each of the geographic regions (Antshel, 2000). These experiences, perceived differently by Latinos from the various sub-groups, may impact the outcomes of care (CDC, 2008; Franklin et al., 2007; Hajat et al., 2000). Studies have clearly shown that race/ethnicity, culture, and the conditions that frame their environment and experiences once they relocate to the U.S. may influence quality of life of Latinos (Christensen, 1975; Cleghorn et al., 2004).

Providers, educators, and healthcare staff may provide more effective care by acknowledging the importance of the family, recognizing the country of origin, and learning the degree to which a Latino client is acculturated (Antshel, 2000). For these reasons, there is a need to understand how quality of life is manifested in Latino populations who are growing, contributing members of the culturally diverse population of the U.S. (Jack, 2003).

CHAPTER III

METHOD

The current study uses secondary data analysis to conduct a descriptive, comparative study of quality of life data. Project IDEAL participants were Latinos with type 2 diabetes living in one region of the U.S. Participants were grouped by one of the four geographic regions of Latin America: South America, Central America, Puerto Rico, or Mexico. The instrument used for quality of life measurement was the diabetes-specific ADDQoL.

Project IDEAL

Project IDEAL (Initiative for Diabetes Education Advancement for Latinos) was a two-year community collaborative, multimatrix, comparison study of Latino sub-ethnicities with diabetes. Subjects who were identified positive for diabetes or pre-diabetes were referred to Project IDEAL and were then screened to have diabetes education in either a group or individual setting. Diabetes education sessions followed the American Diabetes Association (ADA) Diabetes Self-Management Education recommendations (ADA, 2006). ADA recommendations and focus groups were used to develop the program of education and structure the outcomes reported.

Survey Instrument

The ADDQoL is an individualized instrument designed to measure individual perceptions of the impact of diabetes on quality of life (Bradley & Speight, 2002; Bradley et al., 1999). The ADDQoL has been translated into 20 languages and further linguistic validation work is still in progress (Bradley et al., 1999). Although it has been used extensively in England, across the U.S., in South America, and in Asia, its use with the Latino population in the U.S. has been very limited. One limitation noted by Watkins and Connell (2004) suggests further evidence is needed supporting the applicability of the instrument for different groups. According to the author of the instrument, the use of the ADDQoL in this study is the first use of the instrument with a diverse group of Latino-American subjects in the U.S.

The instrument was developed by researchers at the Royal Holloway University of London, Surrey, England, in the early 1990s first with 13-domain specific items, then later modified to include 6 additional domains in the ADDQoL-19. The 19-item instrument (see Appendix B) is a measure of patient perception of the importance and effect of diabetes on daily life. Development of the instrument included general and disease-specific measures, discussions with health professionals, and interviews of adults with diabetes.

The ADDQoL questions ask individuals how they would feel about the various domains if they did not have diabetes. Participants are told not to rate a domain if it is not applicable to them. They are then asked to rate the importance of each domain that is applicable (Bradley & Speight, 2002). Scoring of the instrument is complex and is based

on the mean of the applicable items. The survey takes approximately 15 minutes to complete.

The domains of the ADDQoL address specific areas of life that are impacted by the presence of diabetes. Each of the domains fits loosely within broader health elements of physical functioning, and social and psychological well-being as described by the patient-reported Health Instruments Group (see Appendix A) (Fitzpatrick et al., 2006). The domains of the ADDQoL, however, have not been examined statistically with these sub-domains.

Reliability and Validity of the ADDQoL

The 18-item version of the survey (an earlier version than the one used in the current study) was evaluated for reliability and validity at the Royal Holloway University of London in the United Kingdom as noted above and was found to be statistically reliable with a Cronbach's alpha of .92, indicating high reliability with the English speaking population (Bradley & Speight, 2002). Reliability is concerned with whether an instrument is internally consistent or reproducible. Reliability estimates are recommended to be 0.7 to 1.0 for instruments used for groups and individuals, respectively (Fitzpatrick, Davey, Buxton, & Jones, 1998). For instruments that are used to make decisions about patient care and treatment or for research, a reliability estimate of .9 to 1.0 is recommended (Nunnally & Bernstein, 1994). Validity is whether a measurement tool measures what it claims to measure (Jacobson, 1997). Construct validity of the ADDQoL was examined by Woodcock et al., (2001) with type 2 diabetes patients and compared an 11-item version of the ADDQoL with the SF-36. The study found the ADDQoL and the

SF-36 complementary. Internal consistency of the ADDQoL using an item-total correlation was 0.37-0.67 and a Cronbach's alpha of 0.84 (Garratt et al., 2002). Evaluated against clinical variables for criterion related validity, Bradley et al. (1999) found the scores of the ADDQoL-13 item version of the survey statistically, significantly correlated with perceptions of hypoglycemia ($r = .32$) and the number of reported complications ($r = 0.21$). The differences found were significant in 7 of the 13 dimensions of the instrument (Fitzpatrick et al., 2006).

Scoring the ADDQoL

Scoring the ADDQoL is complex, though the first 2 questions provide general quality of life responses and are scored individually from the 19 domain specific items. The first 2 overview questions of the ADDQoL, "In general my present quality of life is:" and, "If I did not have diabetes, my quality of life would be:" (see Appendix B) are scored individually. Scoring of the first overview question is from an *excellent* +3 to an *extremely bad* -3. The second overview question is scored with -3 *very much better* to a +1 *worse*.

In order to obtain an equivalent measure of QOL for the 19 diabetes-specific domains, the average weighted impact (AWI) of the ADDQoL was calculated. The impact score is the value chosen by the participant that best describes the impact of diabetes on the specific domain in question. Each domain was scored with an impact rating of -3 to +1. Importance ratings were the values assigned by the participant in how important a specific domain was to his or her life. The importance ratings were scored as a 0 to +3. A weighted impact score was then obtained by multiplying the importance

rating times the impact rating to obtain a weighted impact score of -9 (maximum negative impact of diabetes) to +3 (maximum positive impact of diabetes). Any non-applicable domains were not scored. From the weighted impact score, an average weighted impact (AWI) score was obtained. The AWI = sum of weighted ratings of applicable domains divided by the sample size of the applicable domains. Possible results of the AWI ADDQoL ranged from a score of -9 (maximum negative impact of diabetes) to a +3 (maximum positive impact of diabetes) (Bradley et al., 1999).

Variables

Variables for obtaining the demographic description of the participants were taken from surveys of participants from the original study. Demographic variables included age, gender, height, weight, BMI, country of origin, years in the U.S., years since diagnosis of diabetes, years of education, income, and occupation. Other variables were included in the original study, including co-morbid conditions that were felt important to this current study but are not included due to the narrowing of the sample size when included.

Dependent variables for research question 1 included: (1) present quality of life, (2) quality of life without diabetes, and (3) AWI ADDQoL. The independent variables identified were the four geographic regions and included Mexico, Central America, South America, and Puerto Rico.

For research question 2, the dependent variable for the first phase was the AWI ADDQoL scores, and the independent variables for the first phase included the four geographic regions. For the second phase, the dependent variable was the general Without Diabetes question of the ADDQoL, and the independent variables for the second phase

included the sub-domains of the ADDQoL identified through phase one of the research question.

Study Design

The current study is designed as a descriptive, comparative design using secondary analysis of 297 ADDQoL questionnaires. A descriptive design was chosen to provide information on the subjects. The decision to use descriptive was guided by the theoretical foundation (Leininger, 1991) for the study. The individual is part of a larger group and, to understand the individual, one must get to understand the group. A comparative design was chosen, as the design provides the ability to examine differences between Latinos from the different geographic regions.

The ADDQoL questionnaires were administered as a prescreening assessment during Project IDEAL. Follow-up surveys were administered to participants; however, only the baseline screening data were used for the purposes of this study to prevent the influence of the intervention. The ADDQoL survey was administered as a part of Project IDEAL, a community-based participatory study conducted from January 2004 to December 2006.

Subjects

The sample for the study were subjects participating in Project IDEAL. Inclusion criteria for Project IDEAL included having a diagnosis of type 2 diabetes, being able to consent to participate in the study, being of Hispanic/Latino origin, and being 18 or older. Participants were excluded if they had cognitive impairments, were under the age of 18,

and if they did not have a diagnosis of type 2 diabetes. The study population consisted of members of all of the four geographic regions considered in the current study. Subjects were from Central America, South America, Mexico, or Puerto Rico, and all lived in the U.S. at the time of the study. No information was collected about their resident status.

The ADDQoL was approved through the Human Subjects Institutional Review Board (HSIRB) at Kennesaw State University for the original study. In addition, HSIRB application for secondary data analysis for the current study was approved by Western Michigan University's HSIRB as an expedited review.

To assure confidentiality, subject information is maintained in a Microsoft Access database that is password protected and kept on a server at Kennesaw State University. Only the principal investigator and two other key individuals working on the current study have access to view the file. The original survey documents (hard copy forms) with participant names are kept in a locked file cabinet to protect the identity of the participants. Unique identifiers assigned at the time of beginning the program are used in data analysis to maintain confidentiality of the participants.

Procedure

The procedures published by the developers of the ADDQoL were followed in the administration of the instrument to Project IDEAL participants. The surveys were administered by two people who were trained in the use of the instrument. The two researchers who administered the instrument were a bilingual registered nurse faculty, and a native Spanish speaker, who was a physician trained in Colombia. In order to familiarize participants in Project IDEAL with the ADDQoL, the native Spanish speaker

explained the instrument to each participant before he or she received any education on diabetes self-management. It was assumed that participants completing the survey were all able to read and write in Spanish at the appropriate level for the ADDQoL.

Despite the diverse population of Project IDEAL, participants were able to complete the 19-item instrument in about 15 minutes or less. Once participants completed the questionnaire, each patient was assigned a unique identification number and the data were entered into a Microsoft Access database by that unique ID. The database was developed specifically for the study and the forms saved in the individual patient file in a secure, locked location, as noted above.

For the current study, the data from Project IDEAL were obtained from the Microsoft Access database that housed Project IDEAL data. The data were downloaded with the unique identification number of the database included in the download. No names or personal identification information was included. The data were then converted to SPSS data files and variables defined for use in the study. Only the researcher and her doctoral statistics advisor have access to the data for evaluation, which is password protected.

Method of Analyses

Univariate statistical analyses using Statistical Package for the Social Sciences (SPSS) Version 15.0 were used to provide demographic descriptions and frequencies of the key variables. Also included in analysis were the results of the two overview questions of the instrument and the AWI ADDQoL.

For research question 1, the dependent variables were the value derived from scoring the overall quality of life questions posed at the start of the ADDQoL: (1) present quality of life, and (2) without diabetes quality of life. The third dependent variable was the AWI ADDQoL, the weighted score of the 19-domain specific questions and their importance ratings. These variables were examined against the independent variable, region of origin.

Mean values and standard deviations of the present QOL, without diabetes QOL, and the AWI of the four geographic regions were examined. Further analysis was then conducted to answer the first question of the study using a one-way between-subjects analysis of variance (ANOVA) to examine the differences in the mean question scores across the geographic regions. ANOVA was chosen because it allows for testing more than one comparison at a time using a *t* test (Field, 2005). A Tukey's post hoc test of honestly significant differences (HSD) was used to identify significance of the differences identified.

For research question 2, there were two parts to the analysis. The dependent variable for the first phase was the AWI ADDQoL scores, and the independent variables included the four geographic regions. For the second phase, the dependent variable was the general without diabetes question of the ADDQoL, and the independent variables for the second phase included the sub-domains of the ADDQoL identified through phase one of the research question.

For question 2, a factor analysis using principal component analysis (PCA) was conducted to reduce the 19 items of the ADDQoL to four components. The PCA was selected for its psychometric strength in data reduction (Field, 2005). A Varimax rotation

was selected due to its ability to load a smaller number of variables highly onto each factor. Through this ability of the Varimax rotation, the credibility of the clusters is strengthened (Field, 2005). A Kaiser normalization was used, giving each item an eigenvalue of 1 and allowing selection of the variables with an eigenvalue of 1 or greater to be chosen as a component (Field, 2005).

Four domains identified through PCA were calculated to obtain an AWI for each group and converted to standardized (z) scores. Each were then incorporated into the formula, along with the overall QOL from question II to obtain a prediction of the degree of contribution of each variable to overall QOL. A linear regression analysis ($y =$ psychological functioning + social functioning + physical functioning + freedom to drink) was used to obtain the prediction values for each of the four geographic regions. The regression analyses also took into consideration the confounding or interacting variables anticipated or present (gender, income, education, and years living in the U.S.) and controlled for them in the model.

Statistical Analysis Applied to the Research Questions and Hypotheses

Research Question 1: Are there differences in perceptions of quality of life of Latinos with type 2 diabetes across the four geographic regions using the Audit for Diabetes Dependent Quality of Life (ADDQoL)?

Hypothesis 1: Among Latinos who live in the U.S. and have diabetes, there are no significant differences in perceptions of quality of life across four geographic regions using the Audit for Diabetes Dependent Quality of Life (ADDQoL).

Analysis: To answer the first question concerning the difference between the overall quality of life using the ADDQoL (present QOL, without diabetes QOL, and the average weighted impact or AWI ADDQoL), mean scores were identified for the four geographic regions. A one-way between-subjects analysis of variance (ANOVA) was then conducted to compare the means of the three scores across geographic regions. A Tukey's post hoc test was used to correct for any type 1 areas that may have occurred in the significant findings.

Survey Questions: Questions I and II of the ADDQoL were used as the overall questions for QOL. Question I asked, "In general my present quality of life is:" with responses ranging from *excellent* to *extremely bad* using an 8-point Likert scale that ranged from +3 to -3 in value. Question II asked a similar question, but posed the question "If I did not have diabetes, my quality of life would be:" with responses ranging from *much better* to *worse*. The scores ranged from -3 to +1. The AWI ADDQoL scores, the results of scoring the 19 domain-specific items was also worded to understand how the respondent felt if he or she did not have diabetes. The AWI ADDQoL possible results ranged from -3 *much better* to 1 *worse*.

Research Question 2: Are there constructs or domains of the ADDQoL that predict quality of life in the Latino population and its sub-groups who are living in the United States and have type 2 diabetes?

Hypothesis 2: Among Latinos who live in the U.S. and have diabetes, there is no significant association between the constructs or domains of the ADDQoL that predict quality of life in the Latino population and its sub-groups.

Analysis: First, a factor analysis was conducted to determine the sub-domains of the 19-item ADDQoL. Once the sub-domains were identified, the four sub-domains were used to conduct the next step of RQ-2. Sub-domains were examined against the mean QOL of each of the groups for descriptive purposes. Next, a linear regression analysis using forced entry was used to determine if any of the sub-domains predicted quality of life with the ADDQoL for Latinos who have diabetes. The formula used for the regression analysis took into account the impact of each domain using $y = \text{sub-domain 1} + \text{sub-domain 2} + \text{sub-domain 3} + \text{sub-domain 4}$.

Survey Question: The questions that were used to answer the first part of this question were the average weighted impact score (AWI ADDQoL) for sub-domain identification. This first phase used the geographic regions as the independent variables. The second part of this research question included question II of the overall quality of life (without diabetes QOL) as the dependent variable. The independent variables are the four sub-domains identified through factor analysis, and a co-variable is geographic region of origin. Based on prior study of the Patient-Reported Outcome recommendations (2006), the broad sub-domains were thought to include physical functioning, psychological well-being, social well-being, and personal constructs (Fitzpatrick et al., 2006).

CHAPTER IV

RESULTS

For an understanding of the subjects who are included in the current study, the demographic characteristics are presented first. All participants who completed the survey did not provide responses to every demographic question asked, and the resulting data lists that which was provided by the respondents of the survey on a given question. The remaining are listed as missing data. Demographic data include the geographic region, age, gender, income levels, years of education, occupation, years living in the U.S., and years since diagnosed with diabetes.

To answer the first research question, the mean scores of the present quality of life, without diabetes quality of life questions, and the average weighted impact (AWI) of the ADDQoL were examined presented by the four geographic regions.

The four regions were (1) Mexican Americans, (2) Central Americans, (3) Puerto Ricans, and (4) South Americans. The second part of the first question was answered using an ANOVA to determine if there are differences in perception of quality of life using the ADDQoL questions I and II as above, and the AWI ADDQoL. The analysis included testing for type 1 error in the significant findings.

Next, to answer the second research question, a factor analysis using principal component analysis (PCA) was conducted to reduce the 19 domains of the ADDQoL into four sub-domains. The results of the PCA were then used to complete question 2 and

determine which of the four sub-domains most influenced the overall quality of life of Latinos in the study.

Demographic Characteristics of the Population

Using SPSS, Version 15.0, frequency distributions were conducted for the subjects who participated in the study. Age, sex, geographic region of origin, income levels, years of education, years in the U.S., and years since diagnosis of diabetes were included.

The sample, 297 participants, were individuals predominantly over the age of 40 with a mean age of 48. Ages of the subjects ranged from 24 to 76 and were significantly different by geographic region ($p < .001$) with Mexican Americans overall being the youngest and South Americans the oldest. The body mass index (BMI) calculation was obtained from the height and weight of the subjects to provide a standardized measure of weight status, whether normal, overweight, or obese. BMI ranged from 19 to 49 with a mean BMI for the group of 30.5. BMI for males was 29, while the mean BMI for females was 31 ($p < .03$). No significant differences were found in BMI across the four geographic regions ($p = .895$) (see Table 1).

Table 2 reports marital status of those who provided the information ($n = 131$). Approximately 75% were married and 12.2% were divorced or separated. The rest (12.8%) were single. Sample size was a limiting factor within groups to evaluate the differences across Central Americans and Puerto Ricans. Mexican Americans and South Americans were similar in marital status.

Table 1

Geographic Region, Age, Gender, and BMI

		Total Population	Mexican American	Central American	Puerto Rican	South American
Total Population <i>N</i>		297	209	21	9	58
Sex	Female	185/62%	133	14	5	33
	Male	112/38%	76	7	4	25
Mean Age (years)		48	46	50	49	53
Mean Weight (pounds)		173	172	166	161	176
Mean Height (inches)		63	63	61	62	65
Mean BMI	Female	31	31	29	30	31
	Male	29	30	31	27	28

Table 2

Marital Status

	Total Population <i>N</i> /%	Mexican American <i>N</i> /%	Central American <i>N</i> /%	Puerto Rican <i>N</i> /%	South American <i>N</i> /%
Married	97/32	71/57	7/70	1/50	18/75
Divorced/Separated	17/5	8/6	2/20	1/50	6/25
Single	7/2	6/5	1/10	-	-
Total	121/41	85/68	10/48	2/22	24/41
Missing data	176	124	11	7	34

Subjects from the four geographic regions varied in years of education (see Table 3). Of the 59% Mexican Americans reporting years of education, one-half (50%) had 1 to 3 years of formal education, while 15% had 10 or greater years of formal education. South Americans, in contrast, had 93% who reported completing 10 years or greater

formal education. Less than 1% of the South Americans reported having only an education of 1 to 3 years (see Table 3). Central Americans who completed the education question (47.6%) reported having 30% of their population with 10 or more years of formal education. About 10% of the Central Americans had only 1 to 3 years of formal education. The majority of the Central Americans (60%) fell into the middle range of education having between 4 to 9 years of formal education. The Puerto Rican group could not be considered in this analysis due to the high number who did not give information on their years of education.

Table 3

Years of Education

	Total Population <i>N/%</i>	Mexican American <i>N/%</i>	Central American <i>N/%</i>	Puerto Rican <i>N/%</i>	South American <i>N/%</i>
1-3 years	46/37	43/50	1/10	1/50	1/4
4-6 years	18/14	15/17	2/20	-	1/4
7-9 years	19/15	15/17	4/40	-	-
10-13 years	20/16	6/7	2/20	-	12/44
14 and greater years	22/18	7/8	1/10	1/50	13/48
Total	125	86/42	10/48	2/22	27/47
Missing	172	123	11	7	31

Participants in the study were more likely to provide areas of occupation than they were to divulge their education. Over 80% of the 297 participants provided information on the type of work they do. Mexican Americans, South Americans, and Central Americans were equally likely (30%) to have a job as a laborer or to be self-employed,

compared to Puerto Ricans, who had only one person who worked as a laborer/self-employed (14%). About 45% of Mexican Americans and 24% Central Americans worked as homemakers, while South Americans (17%) and Puerto Ricans (14%) were the lowest (see Table 4).

Table 4

Occupation

	Total Population <i>N</i> /%	Mexican American <i>N</i> /%	Central American <i>N</i> /%	Puerto Rican <i>N</i> /%	South American <i>N</i> /%
Sales, Clerical, Restaurant	17/8	9/6	2/13	1/14	5/10
Homemaker	89/41	74/45	5/31	1/14	9/17
Laborer/Self-employed	70/32	48/29	5/31	1/14	16/31
Professional/Technical	13/6	3/2	0	1/14	9/17
Retired/Other	18/8	9/6	1/6	1/14	7/13
Unemployed	32/15	20/12	4/29	2/29	6/12
Total	217/73	163/78	16/76	7/78	52/90
Missing	58	46	5	2	6

South Americans (17%) and Puerto Ricans (14%) were more likely to have professional or technical roles than the other two groups. Unemployment was fairly low in the total population but was highest in the Central Americans and Puerto Ricans.

Of the 49% ($n = 127$) who listed their income for the study, 89% had incomes in the 20,000 or under range and an additional 17% ($n = 22$) reported having no income. Over one-half of the Central Americans ($n = 6$) reported their income below 10,000 per year as did almost one-half ($n = 42$) of the Mexican Americans, making these two groups

the lowest income earners compared to the South Americans. Mexican Americans and Central Americans had more participants with no income (20%) compared to South Americans, who had about 7% in the category. Though only about one-half reported income, participants from all four geographic regions were equally likely to provide earnings information (see Table 5).

Table 5

Population Count by Income Levels

	Total Population N/%	Mexican American N/%	Central American N/%	Puerto Rican N/%	South American N/%
0 - 10,000	52/44	42/49	6/60	1/50	3/11
10,001 - 20,000	42/36	24/28	2/20	1/50	15/56
20,001 - 60,000	10/9	3 /4	-	-	7/26
Over 60,000	1/1	1/1	-	-	-
No income	22/19	18/21	2/20	-	2/7
Total	117/40	85/41	10/48	2/22	27/47
Missing	180	128	11	7	31

Participants were asked to list the number of years they have lived in the U.S. The resulting data were grouped into four categories and are reported in Table 6. The categories include (1) 1 year or less, (2) 2 to 5 years, (3) 6 to 10 years, and (4) 11 years and over. Less than 20% ($n = 42$) of the sample had lived in the U.S. for up to 1 year. Approximately 52% ($n = 112$) had lived in the U.S. for over 5 years, and the rest (24%) had resided in the country for 2 to 5 years. Slightly more than one-half of the Mexican

Americans and Central Americans had lived in the U.S. for over 6 years, whereas South Americans had a slightly larger number in the under 5 years groups.

Table 6

Years Living in the United States

	Total Population <i>N/%</i>	Mexican American <i>N/%</i>	Central American <i>N/%</i>	Puerto Rican <i>N/%</i>	South American <i>N/%</i>
1 or less	42/19	32/22	4/27	-	6/12
2 to 5	62/29	36/25	3/20	1/17	22/44
6 to 10	51/24	37/26	1/7	5/83	8/16
11 and over	61/28	40/28	7/47	-	14/28
Total	216/73	145/69	15/71	6/67	50/86
Missing data	81	64	6	3	8

Only 42% (see Table 7) of participants reported the number of years since diabetes diagnosis. Of those reporting years since diagnosis, over a third (37%) was newly diagnosed with diabetes in the year prior to Project IDEAL referral. Results indicate another 35% ($n = 44$) had known they had diabetes for over 5 years. A smaller percentage (7%) had diabetes over 10 years (see Table 7).

Table 7

Years Since Diagnosis with Diabetes

	Total Population N/%	Mexican American N/%	Central American N/%	Puerto Rican N/%	South American N/%
1 Year or Less	48/41	34/49	6/60	1/50	7/27
2 to 5 Years	25/21	16/23	2/20	-	7/27
6 to 10 Years	35/30	5/7	1/10	-	9/35
>10 Years	9/8	4/6	1/10	1/50	3/12
Total	117/40	69/33	10/48	2/22	26/45
Missing	180	140	11	7	32

Results Related to Research Question 1

Testing for Differences in Overall Quality of Life Across the Four Geographic Regions

Research Question 1: Are there differences in perceptions of quality of life of Latinos with type 2 diabetes across the four geographic regions using the Audit for Diabetes Dependent Quality of Life (ADDQoL)?

Hypothesis 1: Among Latinos who live in the U.S. and have diabetes, there are no significant differences in perceptions of quality of life across four geographic regions using the Audit for Diabetes Dependent Quality of Life (ADDQoL).

Prior to conducting the analysis of variance (ANOVA), a power analysis was performed to check the observed power of the samples. The observed power of the sample by geographic regions for present quality of life (question I) was .834, without diabetes quality of life (question II) was .387, and the AWI ADDQoL was .979, ($\alpha = .05$).

Before beginning the analysis, assumptions of the ANOVA were considered. Levene's statistic was used to examine the homogeneity of the variance for the AWI ADDQoL ($F(3, 297) = 1.497, p = .216$) indicating the assumption was met. Levene's statistic was also used to determine if the variance of question I—present quality of life ($F(3, 297) = 1.024, p = .382$) and question II—without diabetes quality of life ($F(3, 297) = .984, p = .401$) were significant or not. The results show no statistical significance in the variance of the three items indicating the homogeneity of variance assumption is assured for conducting the ANOVA.

To determine normality of distribution for the sample, a Kolmogorov-Smirnov (K-S) test was conducted on each of the three dependent variables by geographic distribution. Results of the K-S indicated overall quality of life measure, AWI ADDQoL was not significant in any of the four geographic groups: (1) Mexican Americans $S(209) = 0.57, p = .095$; (2) South Americans $S(58) = 0.102, p = .200$; Central Americans $S(21) = .133, p = 0.200$; and Puerto Ricans $S(9) = 0.143, p = .200$, providing evidence for normal distribution by group. K-S conducted with present quality of life and without diabetes quality of life revealed asymptotic significance ($p < .001$) and both are recognized as not normally distributed. In view of the power of the sample and the sample size, the decision was made to proceed with the analysis with the understanding that the size of the sample would compensate for the distribution variation in this sample.

The one-way analysis of variance was then conducted to evaluate the relationship between geographic region and the dependent variables, AWI ADDQoL, present QOL (question I) and without diabetes QOL (question II) responses of the ADDQoL. The independent variable was the geographic region where the participants who were

currently living in the U.S. and who had diabetes originated. Four groups, Mexican American, South American, Central American, and Puerto Rican, were used for the analysis. The present quality of life answers ranged from *excellent* (+3) to *extremely bad* (−3) and the without diabetes QOL and the AWI ADDQoL scores, which are also based on the perception of QOL without diabetes, ranged from (−3) *much better* to +1 *worse*. The maximum possible scored values ranged from −9 to +9 on the former, and −9 to +3 on the latter two questions.

For question I, the mean score of the present quality of life was much closer to the mid-point for the score in Central Americans (.6) than the other geographic regions. South Americans were more aligned with the Central Americans in their view of present quality of life than any of the other groups, indicating for these two groups that their present quality of life was slightly good, but not as notably good as Mexican Americans (1.7) or Puerto Ricans (1.0) felt about theirs. A wide standard deviation (11.7) was seen in the Mexican American group, and this was examined using a stem and leaf, and outliers were seen in the excellent range for present quality of life, which likely contributed to the higher score for the Mexican American population. For question II, without diabetes quality of life, the ANOVA results showed no significant differences; however, the similarities for the Central Americans and South Americans prevailed. The wide standard deviation (11.96) was again evident in the Mexican American population (see Table 8).

Next, the AWI ADDQoL (the overall value of the 19 domains of the ADDQoL) was examined against the same independent variables and statistical significance between the four groups ($F(3,297) = 7.02, p < .001$) was reached. Overall quality of life, the AWI

Table 8

ANOVA and Differences in Means of Present QOL, Without Diabetes QOL and AWI ADDQoL by Geographic Region

Region	N	Present QOL		Without Diabetes QOL		AWI*** ADDQoL	
		Mean*	SD	Mean**	SD	Mean**	SD
Mexico	214	1.7	11.7	-.5	11.96	-3.6	2.1
South America	58	.8	.97	-1.9	1.03	-2.6	2.0
Central America	21	.6	.97	-2.0	.97	-4.3	2.5
Puerto Rico	9	1.0	1.0	-1.2	1.2	-1.5	1.3
Total	297	1.5	9.8	-.9	10.1	-3.4	2.2
Between Groups Differences							
F		F = .202		F = .390		F = 7.021	
(df, n)		(3, 297)		(3, 297)		(3, 297)	
Sig.		p = .895		p = .760		p = .000	
<hr/>							
Mean* Scores on a scale of 3 = <i>excellent</i> to -3 <i>extremely bad</i> Mean** Scores on a scale of 1 = <i>worse</i> to -3 <i>very much better</i> AWI*** Average Weighted Impact of 19 domains of the ADDQoL							

ADDQoL is the key dependent variable for the first research question, present quality of life and without diabetes quality of life statistics will not be given further consideration in relation to research question 1 (RQ 1).

A Tukey's HSD post hoc test was conducted to control for type I error in the significant findings of the AWI ADDQoL. Results revealed a clarification of the relationships that influenced the significant findings. No significant differences in AWI ADDQoL between Mexico and Central America were present ($T(297) = -.7112, p =$

.457). Additionally, no significant differences were found between South America and Puerto Rico ($T(297) = -.0605, p = .500$). Significant findings were supported however between Mexico and South America ($T(297) = -1.0003, p < .01$), between South America and Central America ($T(297) = 1.7114, p < .01$) and between Puerto Rico and Central America ($T(297) = 2.7719, p < .01$).

Results Related to Research Question 2

Research Question 2: Are there constructs or domains of the ADDQoL that predict quality of life in the Latino population and its sub-groups who are living in the United States and have type 2 diabetes?

Hypothesis 2: Among Latinos who live in the U.S. and have diabetes, there is no significant association between the constructs or domains of the ADDQoL that predict quality of life in the Latino population and its sub-groups.

Research Question 2

The ADDQoL data from the 297 study participants was next examined by the 19 domains of the questionnaire. Each domain was one question and had characteristics that fit into the categories recommended by the PRO workgroup. To reduce the number of variables for analysis, the ADDQoL 19 dimensions taken from all Latinos in the study were analyzed using principal components analysis (PCA). A scree plot identified four components for the Varimax rotation procedure with Kaiser normalization. Convergence was achieved in six rotations. Once the four components were identified in the group of all Latinos, the PCA was conducted for each of the geographic regions. Due to small

sample sizes of the Puerto Rican and Central American groups, the use of the results of the principal components analysis is limited and is listed here for better understanding of the population. For determination of the sub-domains, the results of the PCA of all groups combined are used and compared to the recommended domains (see Appendix A) as described by Fitzpatrick et al. (1998).

ADDQoL Sub-Domains for Latinos Using Principal Component Analysis

With all Latinos grouped into one sample, the first component identified was responsible for 44% of the variance in the sample. The last three components added brought the percentage of variance to a total of 63%. Nine items loaded on the first component identified. Five of the items had a direct relationship to psychological functioning as defined by the PRO work group. The remaining four items were indirectly related to psychological well-being. For example, the heaviest loading weight (.77) (see Table 9) for Factor 1 did not seem associated with psychological well-being, although the psychological implications of unpredictable financial situations are appreciated. Hence, the nine items loading on Component 1 were categorized as Psychological Well-being. To show the assignment from the PRO work group recommendations for the four indirect items, headings of the PRO work group table (Appendix A) are listed in parentheses after the bolded primary heading.

Component 2 loaded seven items related to physical activity or function and was given the component title of Physical Function. Items loading in the broader sub-domain of physical function included working life, long distance journeys, holiday, and leisure activity. Also loading on physical function were items less likely to be considered a

Table 9

All Latinos-Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL N = 297

Sub-Domains	Principal Components	1	2	3	4
Psychological Well-being (Social Well-being, Role Activities and Personal Constructs)	Financial Situation	0.770065	0.252008	0.127123	-0.05757
	Feelings About Future	0.767444	0.145676	0.191056	0.033404
	Motivation	0.745135	0.36978	0.053458	0.052215
	Living Conditions	0.708444	0.27841	0.184411	0.00467
	Way People React to Me	0.657151	0.297322	-0.01134	0.032565
	Depend on Others	0.653335	0.335739	-0.0343	-0.13536
	Self Confidence	0.651781	0.426297	0.189243	0.067062
	Physical Appearance	0.59531	0.336257	0.293202	0.160192
	Freedom to Eat	0.510342	-0.00954	0.346061	0.05657
Physical Function (Social Well-being, and Role Activities)	Friendships and Social Life	0.474838	0.632434	0.203435	0.115631
	Family Life	0.41899	0.619621	0.206939	0.097194
	Physically Do More	0.397018	0.675417	0.183908	0.158264
	Leisure Activity	0.393068	0.628919	0.08177	0.00053
	Working Life	0.218453	0.646491	0.238371	-0.03222
	Holiday	0.205493	0.713748	0.153674	0.035617
	Long Distance Journeys	0.122005	0.795338	0.09234	-0.10687
Social Well-being	Close Personal Relationships	0.187972	0.36367	0.72844	0.071898
	Sex Life	0.135282	0.211371	0.843015	-0.10038
Freedom to Drink (Physical Function)	Freedom To Drink	0.019471	0.027946	-0.0271	0.963246
Principal Component Analysis with Varimax rotation and Kaiser normalization converged at six rotations 63% of the variance is seen in these first four components					

physical function but were recognized as having a relationship to it. For example, friendships and social life and family life did not seem likely candidates for the physical function, but considering the importance of the family to the Latino population, having limitations in physical activities with the family might severely limit how they would feel about their quality of life. Family life may be considered important especially if Latinos with diabetes think having diabetes limits their ability to provide and care for their family and the social obligations of their family, extended family, and friends. How the individual participant perceived long distant journeys and holidays would be if they did not have diabetes loaded the highest with .79 and .71, respectively, in the Physical Function component.

Component 3 loaded only two items which were both part of the PRO work group recommended nomenclature so was named Social Well-Being. Social Well-Being included close personal relationships (.73) and sex life (.84). The final Component 4 loaded only the remaining one item, Freedom to Drink, which carried the highest value (.96) above all other items in the analysis, though in analysis of variance it had the lowest sub-domain power (.079). No other factor achieved a level close to the last one item in the components. Listed along with the primary sub-domain (bolded font) are secondary sub-domains representing items discussed by Fitzpatrick et al (1998).

Principal Component Analysis for Examining the Individual Geographic Regions

Further analysis using PCA was conducted with each of the four geographic regions. Variations were seen across the results of the four geographic regions. The greatest differences occurred in the Central American, Puerto Rican, and South American

groups. Table 10 shows the principal components analysis of the Mexican American population with the broader sub-domain heading listed to the left.

Mexican Americans

Slight differences were seen in the PCA of the Mexican population compared to the combined groups shown in Table 9. Loading values of each item across the four components differed with each geographic region, although individual items in the Mexican American sample loaded almost identically to the combined Latino groups.

Central Americans

Central American (see Table 11) principal component analysis varied more from the combined group than the Mexican American group. Only seven items loaded on the psychological well-being component for Central Americans. The items included leisure activity, friendships, and social life. Holiday loaded in the psychological well-being sub-domain as opposed to the physical function sub-domain of the combined groups. The way people react to me carried the heaviest loading (.84) with holiday (.80) second. Physical appearance loaded on the psychological well-being as the lowest value, though it was numerically close to loading on the physical well-being and social well-being scales.

The final component had items that fit clearly into the social well-being component of the PRO work group recommendations, although component 2 items were also dominant for social well-being. For this present descriptive analysis using PCA, these two components are listed as social well-being 1 and 2. For the Central Americans, the sample size may have contributed to variations seen in the sub-domains.

Table 10

Mexican American Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL N = 209

Sub/Domains (PRO)	Principal Components	1	2	3	4
Psychological Well-being (Social Well-being, Role Activities, Personal Constructs, Physical function)	Feelings About Future	0.780014	0.183807	0.025573	0.058121
	Financial Situation	0.777131	0.236673	0.059784	0.034889
	Motivation	0.724742	0.417532	-0.02091	0.123583
	Living Conditions	0.711469	0.246629	0.191853	-0.05559
	Self Confidence	0.65935	0.416991	0.155248	0.108452
	Physical Appearance	0.6245	0.299463	0.343955	0.114233
	Depend on Others	0.622035	0.372808	0.03286	-0.10879
	Way People React to Me	0.594587	0.359241	0.087354	0.068534
	Freedom to Eat	0.558246	0.017119	0.208656	-0.23182
Physical Function (Social Well-being)	Friendships and Social Life	0.375188	0.696626	0.200365	0.083471
	Family Life	0.357216	0.693541	0.117553	0.084284
	Physically Do More	0.328928	0.709775	0.207996	0.15612
	Leisure Activity	0.320385	0.643568	0.119889	-0.08272
	Holiday	0.227562	0.698391	0.159512	-0.04159
	Working Life	0.210266	0.677892	0.078113	-0.0104
	Long Distance Journeys	0.105746	0.758956	0.119932	-0.10618
Social Well-being	Close Personal Relationships	0.156063	0.390973	0.709863	0.135383
	Sex Life	0.147639	0.147875	0.880428	-0.08395
Freedom to Drink (Physical Function)	Freedom to Drink	0.01684	-0.03071	0.022806	0.93675
Principal Component Analysis Varimax rotation with Kaiser normalization Rotations converged in 8 iterations 73 % of variation is seen in the first four components					

Table 11

Central American Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL N = 21

Sub-Domains	Principal Components	1	2	3	4
Psychological Well-being, (Social well-being, and Personal Constructs)	Way People React to Me	0.841232	0.24004	0.177665	-0.04045
	Holiday	0.802504	-0.1137	0.246774	-0.09492
	Friendships and Social Life	0.67309	0.196462	0.559022	0.248457
	Self Confidence	0.589015	0.376594	-0.00022	0.490014
	Motivation	0.57439	0.50558	0.143747	0.440356
	Leisure Activity	0.50742	0.530088	0.147854	0.415459
	Physical Appearance	0.501398	0.432111	0.456697	0.23282
Social Well-being (Physical function, Psychological well-being)	Depend on Others	-0.11356	0.841464	0.126007	0.01025
	Living Conditions	0.504158	0.655808	0.256714	0.110165
	Freedom to Drink	0.340451	0.469533	0.182092	-0.55461
	Financial Situation	0.308868	0.736212	0.207962	0.198803
	Feelings About Future	0.301693	0.567433	0.512485	0.428929
	Working Life	0.147549	0.560031	0.474322	0.198341
Physical Function (Social Well-being)	Physically Do More	0.448391	0.361112	0.589315	0.38592
	Freedom to Eat	0.246128	0.223718	0.741349	-0.04158
	Family Life	0.219791	0.410338	0.492146	0.220849
	Close Personal Relationships	0.102868	0.063615	0.881566	0.124706
Social Well-being-2	Long Distance Journeys	0.154604	0.145137	0.106107	0.756678
	Sex Life	-0.0566	0.190953	0.392425	0.750566
Principal Component Analysis Varimax rotation with Kaiser normalization Rotations converged in 8 iterations 73 % of variation is seen in the first four components					

Puerto Ricans

Table 12 presents principal component analysis of the Puerto Ricans in the study, but the sample size with this group, as in the Central Americans, is too small to be useful otherwise. It is provided to aid in understanding those in the study, but otherwise it is not useful. The item with the heaviest loading for Puerto Ricans in this sample was long distance journeys followed by friendships and social life then the way people react to me, depend on others, physical appearance, and freedom to drink.

Table 13 reports the findings of the South American study participants and is closer to the Mexican and Combined Latinos groups. Psychological well-being of the South American population loaded with nine items on Component 1.

These nine items are linked similarly with psychological functioning as occurred in the combined Latinos group. Component 1 loads heaviest with the way people react to me if I did not have diabetes, but diverges from the earlier groups and the combined group in feelings about the future, which loads in the psychological functioning for South Americans but loaded in the physical functioning for Central and Mexican Americans.

To answer the second part of research question 2, “Are there constructs of the ADDQoL that predict quality of life in the Latino population and its sub-groups who are living in the United States and have type 2 diabetes?” a linear regression was conducted. The four components identified in the first part of research question 2 are used as independent variables and are psychological well-being, physical function, social well-being, and freedom to drink (see Table 14). The AWI ADDQoL was the dependent variable for the analysis and the recommended dependent variable for prediction analysis

Table 12

Puerto Rican American Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL N = 9

Sub-Domains	Principal Components	1	2	3	4
Social Well-being (Physical Function)	Long Distance Journeys	0.967623	-0.07499	0.182897	-0.10364
	Friendships and Social Life	0.956663	0.138514	0.228081	-0.04132
	Sex Life	0.815159	0.476085	0.069633	0.21563
	Holiday	0.799157	0.014492	-0.123	0.000101
	Leisure Activity	0.755693	0.121679	-0.09287	0.356891
	Physically Do More	0.704147	0.474441	0.443375	0.188728
	Freedom to Eat	0.559745	-0.0032	-0.64468	0.462566
Role Activities (Physical Function)	Financial Situation	0.557855	0.766392	-0.05727	0.087383
	Working Life	0.54344	0.759859	0.280931	0.172395
	Motivation	0.375158	0.608908	0.307392	0.52532
	Living Conditions	0.363756	0.896277	0.060947	0.161233
	Freedom to Drink	0.122141	0.91748	0.229069	0.253452
	Feelings About Future	-0.36121	0.744565	-0.00183	-0.11547
Psychological Well-being (Social Well-being)	Family Life	0.328653	-0.59483	0.50288	0.367117
	Self-confidence	0.266348	0.173753	0.555945	0.52344
	Way People React to Me	0.064854	0.105539	0.950469	0.22788
	Depend on Others	0.051541	0.144895	0.934659	0.255337
Personal Constructs (Social Function)	Physical Appearance	-0.01882	0.008739	0.340952	0.929911
	Close Personal Relationships	-0.04124	0.607193	0.169089	0.734626
Principal Component Analysis Varimax rotation with Kaiser normalization Rotations converged in 7 iterations 89% of the variation is seen in the first four components					

Table 13

South American Variable Loading in Principal Components Analysis of 19 Variables of the ADDQoL N =58

Sub-Domains (PRO domains)	Principal Components	1	2	3	4
Psychological Well-being (Social Well-being, Role Activities, and Personal Constructs)	Way People React to Me	0.77421	-0.04956	-0.06306	0.060155
	Depend on Others	0.739066	0.3216	-0.08893	-0.1451
	Motivation	0.720301	0.173328	0.234638	0.040071
	Financial Situation	0.712147	0.417598	0.227391	-0.14897
	Friendships and Social Life	0.633547	0.45079	0.169025	0.375858
	Feelings About Future	0.626079	0.019796	0.496301	0.195091
	Living Conditions	0.606117	0.268292	0.281378	0.277859
	Self Confidence	0.517504	0.462095	0.418289	0.175654
	Physical Appearance	0.426205	0.37052	0.189726	0.412721
Physical Function (Social Well-being, Role Activities)	Physically Do More	0.438957	0.639764	0.039128	0.190628
	Leisure Activity	0.420204	0.602157	0.019073	0.185059
	Long Distance Journeys	0.140433	0.840443	0.228272	-0.0024
	Holiday	0.105954	0.722143	0.430108	0.073794
	Working Life	-0.02777	0.605614	0.601946	0.126802
Social Well-being	Family Life	0.43489	0.39455	0.525314	0.338323
	Sex Life	0.028718	0.185218	0.884983	0.038599
	Close Personal Relationships	0.174108	0.182647	0.829391	-0.04799
Freedom to Drink (Physical Function)	Freedom to Eat	0.293518	-0.08486	0.328911	0.649006
	Freedom to Drink	-0.19167	0.241802	-0.1908	0.776249
Rotations converged in 8 iterations Varimax rotation with Kaiser normalization 68% of variation is seen in first four components					

by the author (Bradley et al., 1999). After combining the average weighted index for each of the items on the ADDQoL, the items loading on each of the four sub-domains were grouped to make one variable each. Mean values of each group of sub-domains (see Table 14).

Table 14

Mean Values of Psychological Well-being, Physical Function, Social Well-being and Freedom to Drink for Latinos with Type 2 Diabetes by Geographic Region

	Psychological Well-being	Physical Function	Social Well- being	Freedom to Drink
All Latinos	-4.2110	-3.2525	-3.2342	-.3569
Mexican Americans	-4.4577	-3.4221	-3.4737	-.3301
South Americans	-3.2184	-2.5920	-2.3571	-.4655
Central Americans	-5.5873	-4.0582	-4.1020	-.4286
Puerto Rican Americans	-1.6667	-1.6914	-1.3016	-.1111

Scores with a negative value indicate QOL is viewed better without diabetes. A positive value indicates the QOL would be worse without diabetes.

A scatterplot was used to examine the data for linearity. Pearson correlation coefficients were then examined using the independent variables and demographic variables felt to be possible interaction or confounding risks. Each were tested against the dependent variable without diabetes my life would be ... question (Question II). Physical function (.516, $p < .001$), social well-being (.549, $p < .001$), and psychological well-being (.453, $p < .001$) were the only significant independent variable relationships to the dependent variable. Other groups included freedom to drink ($-.052$, $p = .185$), geographic region of origin (.050), education (.070), gender ($-.007$), and none reached significance.

Regression analysis was conducted with the formula $y = \text{psychological well-being} + \text{physical well-being} + \text{social well-being} + \text{freedom to drink as I wish}$. Results are presented in Table 15 and show an $r^2 = .312$. Psychological well-being ($\beta = .019, p = .812$) was not a significant finding; however, social well-being, physical function, and freedom to drink were significant predictors of Question II. Freedom to drink showed the smallest and only negative effect ($\beta = -.106$) but was significant at the .05 level. The strongest predictor variable in the formula was social well-being ($\beta = .366$) and it reached the highest level of significance with $p < .001$.

Table 15

Regression Analysis of Physical Function, Psychological Well-being, Social Well-being, and Freedom to Drink on Without Diabetes Quality of Life (Question II)

Model 1 R Square (S.E.) .312 (.849)	SD	Parameter estimate (\pm SE)	Beta	C.I.	Significance
Social Well-being	2.41	.155(.041)	.366	.076 – .237	.000
Physical Function	2.05	.103(.050)	.207	.003 – .198	.038
Psychological Well-being	2.94	.007(.028)	.019	-.048 – .063	.812
Freedom to Drink	1.76	-.062(.029)	-.106	-.123 – .001	.031

CHAPTER V

DISCUSSION

This study documented that Latinos with type 2 diabetes who live in the United States differed significantly by geographic regions in how they perceived their quality of life. The significance of the difference was not seen across all Latino groups. Study findings suggested that Mexican Americans and Central Americans were more alike than different, and similarly, South Americans and Puerto Ricans were more alike than different. However, the study findings suggested that Mexican Americans and Central Americans as a group and South Americans and Puerto Ricans as a group were significantly different from each other in the way diabetes impacted their quality of life. The proximity of the two countries to one another in each case may contribute to the similarities of each of the countries; however, other factors may also contribute. A few possibilities include differences in levels of acculturation, education, years in the U.S., or family structure. There are others that might potentially influence the similarities of each of the two groups.

The study also found that the ADDQoL had sub-domains that largely followed the recommendations of the Patient Reported Outcomes work group. Psychological well-being, physical function, social well-being, and freedom to drink loaded each as one of the sub-domains. As predictors of quality of life, only the social domain had a level of significance ($< .001$) that suggested its ability to influence the overall quality of life using

the ADDQoL. Physical function and freedom to drink were also significant at the .05 level; however, psychological well-being was not a significant predictor of quality of life in this study.

Latinos with diabetes are not a homogeneous group. They vary in risk, as well as in culture, language, and how they perceive life quality. These variations may contribute to the effectiveness of education and treatment regimen on type 2 diabetes. Because of the growth in the Latino population in the United States and the barriers and risks they face, there is a need to understand this unique and diverse group and how diabetes affects them. Thus, the significance of the issues and concerns related to the subgroups and QOL, the growing population in the U.S., and the lack of appropriate, culturally-sensitive healthcare and health education lead to the important questions examined in this current study.

The study used a descriptive, comparative design with secondary data from the Audit of Diabetes Dependent Quality of Life gathered as a part of Project IDEAL from 2004 to 2006.

The study posed two research questions and hypotheses.

Research Question 1: Are there differences in perceptions of quality of life of Latinos with type 2 diabetes across the four geographic regions using the Audit for Diabetes Dependent Quality of Life (ADDQOL)?

Hypothesis 1: Among Latinos who live in the U.S. and have diabetes, there are no significant differences in perceptions of quality of life across four

geographic regions using the Audit for Diabetes Dependent Quality of Life (ADDQOL).

Research Question 2: Are there constructs or domains of the ADDQoL that predict quality of life in the Latino population and its sub-groups who are living in the United States and have type 2 diabetes?

Hypothesis 2: Among Latinos who live in the U.S. and have diabetes, there is no significant association between the constructs or domains of the ADDQoL that predict quality of life in the Latino population and its sub-groups.

Demographic Implications

Frequency data help researchers, providers, and educators better understand the population and, through a better understanding, it is the hope of this researcher that improved communications and outcomes may follow.

Project IDEAL, the study that provided quality of life assessment for Latinos in the current study, took place in a Southern city where large numbers of Mexican Americans live. As a result, a large part of the population in the study were Mexican Americans. The South American population is also has a growing presence in the metropolitan area surrounding the study location and, as a result, were the second largest population in the study. While the region of the country where the study took place had many Central Americans living nearby, few took part in Project IDEAL and the sample size was small. The size of the Puerto Rican sample makes it very difficult to use the information, although the number of Puerto Ricans in the region is large and the information is felt to be useful as descriptive, information for awareness.

Geographic Region of Origin, Age, Gender, and BMI

The study sample size was small in the Puerto Rican group and, as a result, the findings related to the group must be interpreted with caution. The study sample was an overall young group with a mean age of 47.5. The wide range of ages may be influenced by the number of years in the U.S. The participants in the original study who were younger had been in the U.S. fewer years and many were less comfortable with speaking English. All participants had type 2 diabetes, a condition that often afflicts individuals in the middle to late years and particularly among Latinas (Latin women) over 40 years of age (ADA, 2005). It was expected that few participants would be young and many would be female. Though type 2 diabetes occurs in adolescents at an increasing rate, no participants were under the age of 18, due to the exclusion criteria of the Project IDEAL study limiting participation to those over 18 years of age. Age varied little by geographic region, though the mean age of the South American group (53) was significantly higher than the Mexican American group and overall was the highest mean age of the four groups.

The population was largely female. Among the women who took part in the original study, they were clear to tell the researchers that they were the ones who had to look out for the health of the family. Additionally, women may have more time to participate in educational programs to learn healthy messages for their entire families and may be more likely to seek health care services for their children and therefore for themselves.

While the risk for diabetes is recognized as higher in Latinas, other factors may have contributed to the the lower percentage of males. Many of the men were the sole support of their families working in day laborer jobs, and these hours of work may have prevented them from seeking health care or spending time in educational programs. They also may have feared losing their jobs if they sought care for diabetes or if they had to leave a work assignment. Another consideration is that men may be less likely to recognize the need for education for health promotion. Each of the four geographic sub-groups had similar percentages of females to males.

Overweight and obesity are co-occurring conditions and risk factors for Type 2 diabetes (ADA, 2008b), so the fact there was a large percentage of the population overweight or obese was expected. Body mass index (BMI) was significantly different between men and women in the study, with women averaging a higher BMI (31) than men (29). Differences were also apparent among the four geographic regions, with Mexican American males and females having no statistical differences in BMI, whereas Central American males were more likely to be obese than females ($p < .0001$), and Puerto Rican and South American females more likely to be obese than males ($p < .001$). Differences in BMI may also have a direct relationship to the differences seen in the populations risk for diabetes and for the percent of women in the study. Those who work in construction jobs or are self-employed with lawn service work, for example, spend many hours of the day walking, climbing, and performing strenuous physical labor that may help to burn off more calories and keep the overall BMI down, as well as the rate of diabetes, in men. It is not clear why Central American men may have higher BMIs than

the Central American women in this study; however, the size of the sample limits interpretation.

Mexican Americans and South Americans were taller than the Puerto Ricans and Central Americans in the study. The differences in height may be related to the European influence on South Americans, but may also be related to poorer nutritional status or other environmental factors.

Education, Occupation, and Income

Not all participants in the study provided information on their educational level; however, of those who did, over one-half (see Table 3) had less than three years of education. Surprisingly, a sizable number of participants (15%) had 10 years or greater of formal education across all Latino groups. When examined by geographic region, differences are more evident. South Americans were more likely to have an equivalent of high school or college degrees and some had a professional degree compared to Central Americans and Mexican Americans, where about one-half had less than 6 years of education. South Americans who come to the U.S. may be more likely to come here to seek new positions and gain improved educational opportunities and hence may arrive with higher levels of education. Questions related to literacy levels of the subjects were not incorporated into this study and years of education may not equate with the ability to read or write. For the purpose of this study, however, those who completed the ADDQoL had to do so alone and completing it required the ability to read in Spanish.

Regardless of the educational level of the participants, few had employment that required a college education. Participants were asked to choose from a list of eight

employment categories ranging from unemployed to professional work. A category of laborer was also included but loosely defined as any job that did not require a college education or formal training and included self-employment. Occupational groupings included clerical, restaurant, and sales grouped together; professional and technical grouped together; and retired and other grouped together. Unemployed and homemaker were independent categories. Many of the Latinos living and working in the study area worked as day laborers or were self-employed with lawn care services or painting and construction companies.

Laborers and homemakers made up the two largest occupational groups within the study. The large number of homemakers may be due in part to having a higher number of female participants than males in the study and the fact that Latinas often fill traditional roles working in the home or in jobs that provide care or service in the homes of others. Latinas who participated in the Project IDEAL study reported working in homemaker roles, either cleaning or childcare for others (private or public organizations) or in their own homes. About 13 (5%) of the population listed their occupation as professional or technical. One was a physician, and one was recognized as the *curandero* (medicine man) for their community, while another worked in equipment repair.

Individual participants in the study may not have listed their current occupation but may have listed their occupation for which they were trained. For example, one participant stated she was a physician who could not practice in the U.S. due to the difficulty obtaining sponsorship for medical practice sites for foreign MDs. Another

participant had a degree in engineering from Colombia but could not find a job as an engineer in the U.S. and was working as a leaf blower for a lawn service.

Mexican Americans, South Americans, and Central Americans were equally likely to have a job as a laborer or to be self-employed, compared to Puerto Ricans, only one of which worked as a laborer. In the role of homemaker, Mexican Americans (40%) were much more likely than others to work as homemakers, followed by Central Americans (24%), while South Americans (17%) and Puerto Ricans were the least likely to work in the role. South Americans (17%) and Puerto Ricans were more likely to have professional or technical roles than the other two groups. These groups also had the highest number of years of education.

Unemployment was fairly low across all Latinos combined (about 15%) but was highest among the Central Americans (25%) and Puerto Ricans (30%). There may have been interpretational differences among the groups as they read the list, such as women who work in the home may have felt they were unemployed and did not list an occupation. Overall, occupation was one of the questions that was most consistently completed by the participants.

Project IDEAL referrals were largely from a clinic serving low SES populations. As a result, the income levels of the group in the current study were also low. Of those who listed their income for the study, most reported being in the \$20,000 or less range for their family. Education did not improve the income levels for participants in the study, as those from South America, who were the most highly educated with a mean of 12 years,

had incomes comparable to participants from the other three geographic regions of less than \$20,000 per year.

Central Americans were the lowest income earners in the population, followed by Mexican Americans. Over one-half of the Central Americans reported their income below \$10,000 per year as did almost one-half of the Mexican Americans. With the large percentage working as laborers or homemakers, the latter two groups are not surprisingly the lowest income levels.

Participants also may now have felt safe to reveal their income for lack of trust of the health care providers. At the time of completion of the ADDQoL, the participants had just met the researchers and may not have feared sharing the personal information.

Years Living in the United States

The study population were not all newcomers to the United States, although about a third lived in the U.S. for 5 years or less. Close to a half of the subjects in the study had lived in the U.S. for 6 years or longer, and of these, almost a third for over 10 years. Years in the U.S. were equivalent across all four geographic regions.

The researcher expected to see years in the U.S. as a contributor to higher levels of acculturation and perhaps influence quality of life perception. It was also anticipated that those who live in the U.S. longer might have higher numbers of health conditions and severity of diabetes. This did not prove true, however, as no significant relationship was found between quality of life and years in the U.S.

Diabetes Duration and Co-Morbidities

Study results revealed only about 42% of the population was able to identify the length of time since they were diagnosed with diabetes. Over a third (37%) of these participants in the study were newly diagnosed with diabetes in the year prior to Project IDEAL class and study referral. Surprisingly, however, an almost equal percentage (35%, $n = 44$) came to have diabetes education classes after being diagnosed for over 5 years and about 7% had been diagnosed over 10 years. This length of time since diagnosis may contribute to the number of participants who had co-morbid conditions in addition to their diabetes. According to the American Diabetes Association (ADA, 2005), individuals who are diagnosed in the U.S. often have had diabetes for 5 years or more at the time of their diagnosis and already have evidence of end organ disease.

Another point of interest in the years since diagnosis is the matter of how long since diagnosed without having access to diabetes education classes. Only about a third of the group was newly diagnosed, but of those who completed the ADDQoL, none had had diabetes education classes in the past. Diabetes education classes have been available in a local hospital, in numerous physician offices, and through a United Way Organization in a nearby city, and yet these individuals had lived with diabetes for years, knowing they had it, and not having access to education for self-management. A few had monitors given to them by their health providers, but use of the monitors was reportedly inconsistent due to the cost of the blood glucose strips. Having diabetes for over five years, as some of these participants have had, may have placed them at high risk for complications of diabetes and ultimately for poorer life quality.

Participants were asked to list other health conditions they had at the time of referral and ADDQoL completion. A list consisting of (1) musculoskeletal problems, (2) depression and anxiety, (3) heart disease, (4) hypertension, (5) low vision, (6) hearing loss, (7) stroke, (8) respiratory problems, and (9) kidney problems, etc., was included. For matters of the current research, the number of co-morbidities is included in the data presented here. Of those who listed other conditions from which they suffered (24% of the population), 34% (24) had more than three conditions that affected their health. Researchers considered that individuals who had more chronic health conditions might have poorer perceived quality of life. It is possible that conditions might have varying effects on the participants' view of their health and one condition might create a more negative sense of health outcomes than others. It was also assumed by the researcher that having depression or anxiety might increase the likelihood of having a poorer perception of life quality.

Demographic data reveal a diverse group of participants who also have many commonalities. The population faces a variety of factors that can impact the outcome of care and could influence their perception of quality of life, such as being overweight or obese, being less familiar with the surroundings or resources or having no resources available, and having various co-morbidities from living with diabetes unchecked for years. Despite these differences and challenges, Latinos are a largely homogeneous group when it relates to gender and age, family, marital status, and income, but are diverse in education and occupation.

Missing Data

The surveys for demographic data and quality of life were all completed upon assessment to enter the Project IDEAL classes. As a result, most of the participants did not know the researchers and educators for the program on the first day of meeting them and may have hesitated to divulge personal information. Some who did not give information on this baseline survey later provided more information about their income, marital status, and education. The data presented in results identify large segments of missing data in several of the questions posed. Some questions had more data missing than others. In examining study results, the missing data created limitations in generalizations particularly by sub-ethnicities. The number of missing cases are listed at the bottom of each demographic table.

No data are missing data from the ADDQoL responses. Only the cases where all aspects of the ADDQoL questionnaire were answered were used in the analysis of this current study.

Results of Research Question 1

The purpose of this study was to identify the differences in perceptions of quality of life of Latinos across four geographic regions using the Audit for Diabetes Dependent Quality of Life (ADDQoL). Understanding the differences is important, because Latinos are a diverse population and the country from which they originate may have cultures, beliefs, or practices that influence health outcomes. In summary, this research has several findings.

Research Question 1

The first research question asked if Latinos from the four geographic regions differ in the way they perceive their diabetes-related quality of life using the ADDQoL. In order to examine this question, first the means of the questions were analyzed. The result of the analysis for question 1 reveals noticeable differences in mean scores of the three ADDQoL questions used for the analysis. Present QOL, without diabetes QOL, and the AWI (average weighted impact) scores were used.

A look at some of the detail provides a framework for discussion, as the researcher anticipated that those who were from South America and Puerto Rico would perceive their quality of life better than those from Mexico or Central America. The study findings revealed this was not the case. Central Americans were more likely to view their present quality of life positively, though weakly, so South Americans (.6) were similar to Central Americans (.8) in their perception of their present quality of life. However, Mexican Americans and Puerto Ricans in the sample felt their quality of life was good. The same pattern was evident in without diabetes quality of life.

Any number of reasons may contribute to these findings, but one possibility is the incomes, while very low by U.S. standards, are much higher than the average annual income of far below \$10,000 per year for most Central Americans. Those who come to the U.S. to work earn the money and often take it back to their home country to support family there. Food is plentiful in the U.S. While the food the participants may be able to afford may be high in fat and in carbohydrates, having access to food may be an especially positive experience for those who are newer immigrants and who have been

accustomed to severe levels of poverty in their home countries. It is not clear as to why South Americans would have the lower scores on either question.

An analysis of variance was then conducted to examine the differences statistically among the three questions and across the four geographic regions. It was thought that differences would be seen both in present quality of life and in quality of life without diabetes. No significant differences, however, were found across the geographic regions for these first two questions. The findings of the analysis of variance (ANOVA) presented in Table 8 of the study reveals the statistical significance that was achieved ($p < .001$) across geographic regions when analyzing the differences in AWI ADDQoL scores across geographic regions. The AWI ADDQoL, was the one question that captured the essence of all of the 19 domain specific items of the instrument. The score for the question was the representation of the impact of diabetes treatment and complications on life quality and, as a result, offers more insight into the impact of the disease on subjects in this study.

With the results of the ANOVA significant at the .001 level, a pairwise comparison was conducted to examine the actual differences. Significant differences were found between Mexico and South America ($p < .01$), and between Mexico and Puerto Rico ($p < .03$). No significant differences were present between Mexico and Central America ($p = .457$), or between South America and Puerto Rico ($p = .500$). Geographically, South America and Puerto Rico are in proximity to each other. Many of the participants from South America and Puerto Rico had higher education levels. Central America and Mexico are also in close proximity geographically. It is not clear that

geographic proximity of the country or region of origin might impact quality of life alone, but some cultural values or beliefs may also be similar. More likely, however, is the fact that Mexican Americans and Central Americans were more likely to work in similar areas and have fewer years of education. Other factors may also contribute that are not possible with this current study.

The fact that significant findings were present in the AWI ADDQoL led the researcher to reject the null hypothesis. There are differences in quality of life of Latinos with diabetes from the different geographic regions of Latin America. Similarities are seen between South American and Puerto Rico and similarities are present between Central America and Mexico. Significant differences were present between the two groups.

Research Question 2

The second question sought to identify the sub-domains of the ADDQoL and determine if there were predictors of quality of life among the findings. Since the ADDQoL has never been broken down into sub-domains, identifying sub-domains and delving into the differences across the domains was needed. It was thought that the physical domains of quality of life might have a greater impact on perceptions of quality of life since numerous restrictions for activities of daily living are impacted by having type 2 diabetes. It was also believed that the psychological or emotional factors might impact overall quality of life since people who were more confident or more motivated or more hopeful about their future might have a higher level of quality of life. It was also

believed that how Latinos perceive their quality of life might offer insight for providers and educators who work with Latinos in health education or care settings.

Factor Analysis of the ADDQoL

The first part of research question 2 required that a factor analysis be conducted. Results of the ADDQoL principal component (factor) analysis clarified four major categories or sub-domains of the instrument. For determining the groups, all Latinos were included to identify the sub-domains of the instrument's 19 items. The sub-domains identified were Psychological Well-being, Social-Well-being, Physical Function, and Freedom to Drink. Three of these sub-domains (social, psychological, and physical) have similar item loadings as those recommended by the Patient Reported Health Instruments Group at the University of Oxford, England (Fitzpatrick et al., 2006). The fourth, Freedom to Drink, stands alone as a sub-domain with only one item loading. The Freedom to Drink sub-domain loaded with the highest loading weight (.96) of all the items in the questionnaire.

The recommendations of the PRO work group (Appendix A) were clearly stated for which construct or item should fit in each of the categories. However, upon completion of the factor/principal component analysis, the item distributions overall among the domains of the ADDQoL was not as clear. Items such as physical appearance that fell within the personal construct domain for the PRO group, loaded onto the psychological well-being of the ADDQoL with the current sample of Latinos. Having the freedom to eat, identified by the PRO group as a physical function, loaded as a psychological function with the Latinos completing the ADDQoL. Being free to eat may

have more implications psychologically for the Latinos with type 2 diabetes, than the generic instrument recommendations of the PRO group.

The fact that the freedom to drink question asked if you did not have diabetes would it impact your freedom to drink (fruit juices, alcohol, cold or hot sweet drinks) loaded as an independent component suggests that the limitation on beverage options for Latinos with type 2 diabetes may be independent of all other components. The carbohydrate restrictions of type 2 diabetes diet leaves little room for fruit juices and beverages that normally have high sugar content. Latinos from all regions who were in the Project IDEAL study reported drinking tropical and citrus juices with every meal. Rather than a cola beverage or milk, juice was preferable. Additionally, with most of the Latino countries having a tropical climate and access to low-cost tropical fruits, giving up this part of their past or even limiting it may make the item on the ADDQoL a significant component by itself.

Puerto Ricans who took part in a focus group conducted prior to the Project IDEAL intervention phase also suggested being able to drink alcohol was important. They reported that for Puerto Ricans a sign of good etiquette is to bring out the “good bottle of rum” for esteemed guests. While no reference to misuse of the substance was included in the questions for the participants, the knowledge of its limitation in the diet may make its perceived value greater.

An interesting observation is noted when examining the importance of freedom to drink domain of the ADDQoL. Latinos in the study rated freedom to drink the least important of all of the 19 domains. With a score of 0 indicating *not important at all* and 1

indicating *a little important*, the mean importance score for freedom to drink was only .31. With the information of the importance value, it may be considered the only domain and component of the ADDQoL that has no importance to the population compared to other more critical items, and as the lowest stands alone as a component. It is not surprising then that this component, which is the only item loading in component 4, has almost all of the scores for that component loaded onto the one item. Further study in the area of freedom to drink would be helpful.

The principal component analysis was then conducted on each of the four geographic regions to determine how these components would fare by region. The Mexican group, having the largest population of all four regions, had identical responses to the overall Latino groups used for the analysis. Puerto Ricans, Central Americans and South Americans varied in a few of the components.

The Puerto Rican group results may be limited for interpretation due to the sample size, but those participants in the group felt their physical appearance would be much better if they did not have diabetes (.93) and close personal relationships was a closely related item for this component that had two items only. Among Puerto Ricans in the study, there were more overlaps across the psychological and physical domains such as financial situation grouped with physical functioning, whereas it loaded in the psychological well-being sub-domain for the Mexican and South American groups.

Financial concerns also loaded in physical functioning for Central Americans in the study. Central Americans differed from other groups in that their feelings about the

future if they did not have diabetes were related for them to their physical functioning but to psychological well-being for all other groups.

The primary message that can be taken from this discussion of the differences across the region may be limited to our conclusions about whether one item or another should be part of physical functioning, psychological well-being, social well-being, or not, but that there are differences and those differences may contribute to how individual groups respond in health care settings. The discussion provides only a small amount of information that needs further defining and refining for a complete understanding, and this researcher hopes that future research will provide more clarification of the meaning of some of these differences.

On all items of the ADDQoL, responses indicate that Latinos across all regions felt their life quality would be better if they did not have diabetes. Across geographic regions, whether each item related to their social, psychological, physical function, or freedom to drink varied. Results suggest that individuals from different regions perceived the impact of some items greater psychologically and others physically.

Research Question 2, Part B

The second part of research question 2 addressed the ability of each of the sub-domains identified in research question 2A to predict quality of life. For the analysis, using the without diabetes question asked at the opening of the survey, the social well-being, physical function, psychological well-being, and freedom to drink sub-domains were used in a linear regression analysis. A forced entry method was used to determine if

any of the sub-domains were predictive of quality of life in Latinos with diabetes. Results of the testing revealed significance at the .03 level, $\alpha = .05$.

Hypothesis testing of the null indicated a $p < .001$, $\alpha = .05$. Hence, the null was rejected. In the presence of a significant probability for the ANOVA's F statistic in testing the null hypothesis, the likelihood of having at least one of the predictor variables different from zero was high. Approximately 31% ($r^2 = .312$) of the variability in the dependent variable, without diabetes quality of life, could be explained by the three significant variables: (1) social well-being, (2) physical function, and (3) freedom to drink.

Of the four sub-domains identified for the ADDQoL, social well-being ($\beta = .366$) carried the highest beta score and was the most significant ($p < .001$, $\alpha = .05$). When the alpha was set at .01, the score remained the highest in significance and all three coefficients were significant at the .05 level or lower. The results of the regression analysis suggested that for every 2.41 change in social well-being of the ADDQoL, the perceptions of what QOL would be without diabetes changed by about a third of a point (.366). What this means is that as social well-being improved, an overall improvement in quality of life was seen, and those who felt their close personal relationships and sex life were negatively impacted by diabetes and its complications also were more likely to say that their overall quality of life was impacted negatively by diabetes. Attention to patients who have concerns related to their close personal relationships, such as counseling if needed, or related to their sex life, such as medications for the erectile dysfunction that occurs with diabetes over time, improvements in quality of life may also be possible.

Using the social function as a predictor of quality of life or screening mechanism to identify areas where intervention might prevent further deterioration could be useful in a clinical and in an educational setting.

Physical function was also a predictor of QOL without diabetes. For every 2.05 change in physical function, a corresponding change of .207 ($p < .05$) in QOL without diabetes was present. As Latinos with diabetes in this study improved in their physical function, items such as being able to participate in leisure activities, to work, to go on holidays, and to physically do more, their overall quality of life improved.

The final significant predictor of QOL for Latinos was found in freedom to drink, the individual domain of the ADDQoL that grouped as a separate sub-domain. For every 1.76 improvement in perceptions of freedom to drink, a decrease in the QOL without diabetes ($\beta = -.105$, $p < .05$) occurred. When examining the same variable under the pairwise correlations of the test, freedom to drink had a weak negative relationship with the dependent variable (without diabetes QOL) and the correlation was not significant ($p = .185$). This level of significance also supports the importance values of the ADDQoL with freedom to drink question having the lowest score (.31) of all importance questions of the instrument.

In view of the correlations and regression findings, it is difficult to draw conclusions about the freedom to drink variable. Some of the difficulty may lie within the fact that only one item of the ADDQoL contributes to the sub-domain, whereas other sub-domains have multiple items included. Being able to drink is an important function for Latinos, but the view of the life quality and perception of how their life would be without

diabetes carries lesser importance over other factors such as social well-being that includes family and work, which are ultimately very important in Latino life.

The lack of significance in the psychological well-being sub-domain of the ADDQoL also bears further study in Latino populations. The regression analysis indicates it is not a significant predictor of quality of life. The view of the significant relationship that was seen between psychological well-being and quality of life makes this researcher wonder if it could be predicted by, rather than a predictor of quality of life.

Comparison with Previous Research

The impact of family, close personal relationships, and ability to work and take part in physical activities emerged as principal factors valued by Latinos as they perceive their quality of life. While the questions were posed to identify the negative impact of diabetes on the individual perceptions of life quality related to each of the four sub-domains, the data painted a picture depicting a population who values family and personal relationships. A study conducted by Rinderle and Montoya (2008) suggested familism would play a role as an important predictor of identity in the Latino population; however, their study, conducted with Latinos in New Mexico, showed no significant impact of familism on this aspect of their own identity labels.

Examining the demographics of the current study also suggests difficulty in defining social class once in the U.S. when individuals with high levels of education are working in low-paying laborer roles or are unemployed. This change in role may level the class differential somewhat until individuals are able to recover their social standing or find improved work status.

According to Huang et al. (2007), Latinos who have diabetes are more likely to have negative perceptions of quality of life than are non-Latinos, and these feelings may reflect beliefs about health, illness, and treatment that may impede their willingness to engage in treatments or medication regimen. Another study found that Latinas in the study felt that not having a chronic disease was being healthy, but within the same group they also described one could have a chronic disease and still feel happy (Hartweg & Isabelli-Garcia, 2007). While the intent of the current study was not to compare across racial/ethnic groups, the study reinforced the finding of Huang et al.(2007) and Hartweg & Isabelli-Garcia (2007) in that Latinos in this study viewed their quality of life with diabetes negatively. It is therefore important to understand Latino values and beliefs as they relate to health.

Across the geographic regions of the study, the psychological impact of diabetes was evident among all Latinos. The impact on the psychological well-being of the subjects from Mexico, Puerto Rico, and South America was clear and was recognized as significant in its relationship to quality of life. As a predictor of quality of life, psychological well-being fell short of reaching significance to impact quality of life. This study suggests that being able to work and provide for the family, and to take part in family activities and social functions with families carries more value to Latinos.

This study supports Silen's earlier research (1971) in that the family has great importance for all Latinos and in particular Puerto Ricans. The large families, the compadrazgo (godparent) relationship and social life of the Puerto Ricans, as well as the hospitality of the group is common and is not lost in groups living in the U.S. for years

(Silen, 1971). Findings of the current study support the value of family through the responses to the physical function and social well-being sub-domains.

Clear differences in quality of life were seen in the current study between South Americans and Puerto Ricans as a group and Central Americans and Mexicans as a group. Central Americans and Mexicans are from countries with much lower levels of income per capita and may have brought lower levels of social capital on immigration (Casteneda & Manz, 2002; Gimenez, 1989; Hyman, 1966; World Atlas, 2008). This fact may have influenced the responses of the Central Americans in the study.

Central Americans were more likely to have a negative view of their quality of life than were any of the other groups. This seems to contradict the findings of Michel et al. (2007) who found that the Mayan beliefs placed the well-being of a person on the concept that man can prevent physical or psychological illness by having a balance of intrinsically controlled factors. An imbalance of these components according to Michel et al. causes physical or psychological illness. One might conclude that having the power to control well-being would decrease the worry, yet the Mayans are a part of the Central Americans who have the lowest perceptions of their life quality.

The current study showed significant differences in the QOL responses across the four geographic regions, though many similarities were evident in the demographic examination, and similarities that could be related to social class and culture were present. Gimenez (1989) reported that it is important to go beyond cultural explanations of aggregates, because doing so might reveal more similarities than differences by social class. This study confirmed Gimenez' finding that the differences seen in the population

studied were more similar than different in income and occupation, both closely related to social class. Findings of the current study also suggest that quality of life is not statistically affected by the income or occupation of the Latinos in the study. The study did find a significant predictor of quality of life among factors related to social well-being and physical functioning.

The literature databases are replete with the growing body of knowledge about the Latino population from the various Latin countries. The studies offer an understanding of where Latinos originate and provide insight and a foundation for understanding and impacting treatment options. The knowledge of the past is important, but inadequate alone. Examining the impact of the time in the U.S. and the impact of the American culture on Latinos is helpful, too. Time in the U.S. alone, however, is not a measure of acculturation and cannot be used to determine quality of life. A few key points emerge from this study:

1. Latinos are different and cannot be educated or treated effectively as a “one size fits all.”
2. Latino differences by geographic region are limited by geographic regions in proximity, with Central Americans and Mexican Americans significantly different in quality of life from South American and Puerto Rican participants in this study.
3. Factors that contribute to social well-being and physical functioning may be one way to aid in improving quality of life in Latinos with type 2 diabetes.

Limitations

There were many cases of missing data among the demographic variables, which the researcher recognizes as a limitation for making generalizations, as the sample size varied. It is possible some of the study participants had more trouble reading the Spanish forms or perhaps understanding them. The process of answering questionnaires may be foreign to some participants. The terms used on the questionnaires were derived from other documents that were used in larger studies of Latinos, but may have been confusing to this group. Not having the forms completed by a trusted health care provider or educator may have posed a limitation that set the stage for sizable missing data. For many of the study participants, the day of forms completion was their first or second time to meet the researchers. Some participants were referred from community screenings where the researchers were also present; others were referred by the local free clinic or their own private providers and had never met the researchers. Still others may not have responded to some questions because they felt they were personal or too probing. Others may have been fearful about giving out too much information for fear of deportation, for example, if others knew what a short time they were living in the U.S. or perhaps how much money they earned.

Another limitation of the study is the small size of the Puerto Rican sub-group limited the ability to make inferences from the population findings. Additionally, study subjects were largely of lower socioeconomic status, as they were either referred from a clinic that served uninsured or underinsured or were self-referred. As a result, this convenience sample also limits the generalizability of the findings.

Implications for Provider Practice

This study has several implications for providers and educators who work with Latinos with diabetes. Conducting this study provided an opportunity to increase understanding of Latinos who live in the U.S. and how they perceive diabetes to impact their life quality. The study also provided an opportunity to examine differences in perceptions of quality of life across geographic regions and across social, physical, and psychological domains of life quality. Knowing that social and physical function have high influence over the overall quality of life may lead some educators and providers to focus their attention toward these constructs. From a clinical standpoint, social or physical domain scores might be used to identify areas where interventions are needed, such as referral to counseling for scores that suggest quality of life is decreased secondary to social functioning, or considering the use of medications to assist patients in erectile dysfunction when they are less likely to mention it directly. Having such information prior to education classes for diabetes might guide educators in teaching strategies that incorporate the value of being able to work or to take trips or spend time with family as motivators for behavior changes.

Disease-specific quality of life measurements such as the ADDQoL are important as predictors of health outcomes and may be predictive of subsequent mortality (Idler & Benyamini, 1997). Establishing a functional, reliable, and valid instrument to measure not only disease-specific overall quality of life in Latinos with diabetes, but also provide the specific breakdown by sub-domains for potential refinement of specific interventional strategies could aid in reducing mortality.

Suggestions for Future Research

Studies are needed to continue to examine the relationships among Latinos and their health care providers and educators, and, in particular, among Latinos who have diabetes. A generic, broad stroke assessment of quality of life may not be adequate to capture the specific nuances of the treatment regimen for diabetes on individuals and families. There is much to learn regarding teaching strategies that are more effective in diverse populations such as Latinos. Further research is needed in the area of Latino health as it relates to how they perceive quality of life in general and specifically across physical and social domains. While psychological impact on QOL in the current study was minimal, studies that examined the individual items within the ADDQoL with psychological references would be helpful. Further research is also needed in examining the sub-groupings of the ADDQoL. Another study with a broader scale recruitment and using multiple sites might provide better generalizability to a larger segment of the population.

Summary

In summary, this research presented several important findings. First, this study documents that there are significant differences in quality of life results for Latinos from the four geographic regions, so the null hypothesis of the study was rejected for research question 1. The second question of the study examined predictions by social, psychological, and physical function. Significance was reached indicating predictors in both the social and physical function sub-domains; however, the psychological sub-

domain was not found to be a predictor. More research is needed to determine if there are other variables that may be contributing to these findings. Studies are needed to continue to examine the relationships among Latinos and their health care providers and educators, and, in particular, among Latinos who have diabetes. A generic, broad-stroke assessment of quality of life may not be adequate to capture the specific nuances of the treatment regimen for diabetes on individuals and families. There is much to learn regarding teaching strategies that are more effective in diverse populations such as Latinos. Further research is needed in the area of Latino health as it relates to how they perceive quality of life in general and specifically across physical and social domains. Further research is needed in examining the quality of life of Latino sub-groups who have diabetes. Further analysis of the sub-groupings of the ADDQoL would aid in confirming the findings of this study.

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Appendix A

Comparison of Domains of Health Between Patient-Reported Health Instrument Recommendations and the ADDQoL

Patient-reported Health Instruments Group, Fitzpatrick et al., 2006, p. 20. Based on “Domains of health most commonly assessed in patient-reported health instruments”	ADDQoL- Factor Analysis Results and the questions that fell into each category
Physical Function Mobility, physical activity Activities of daily living: ability to eat	Physical Function Leisure activity, working life, long distance journeys, holiday, physically do more, family life, friendships and social life
Psychological well-being self-esteem	Psychological Well-being Self-confidence, motivation, way people react to me, feelings about future, financial situation, depend on others, living conditions.
Social well-being Family and intimate relations Social contact, integration, and social opportunities Leisure activities Sexual activity and satisfaction	Social Well-being Close personal relationships, Sex life
Role activities Employment Financial concerns	
Personal constructs Satisfaction with bodily appearance	
	Freedom to Drink

Appendix B

ADDQoL

ADDQoL

This questionnaire asks about your quality of life – in other words how good or bad you feel your life to be.

Please put an "X" in the box that best indicates your response for each item.

What we would like to know is how you feel about your life now.

I) In general, my present quality of life is:

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
excellent	very good	good	neither good nor bad	bad	very bad	extremely bad

Now we would like to know how your quality of life is affected by your diabetes, its management and any complications you may have.

II) If I did not have diabetes, my quality of life would be:

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
very much better	much better	a little better	the same	worse

Please respond to the more specific questions on the following pages. For each aspect of life described:

For Part (a): put an "X" in one box to show how diabetes affects this aspect of your life;
For Part (b): put an "X" in one box to show how important this aspect of your life is to your quality of life.

1 (a)	If I did <u>not</u> have diabetes, I would enjoy my leisure activities:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	very much more	much more	a little more	the same	less
(b)	My leisure activities are:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	very important	important	somewhat important	not at all important	

2	Are you currently working, looking for work or would you like to work?				
	Yes <input type="checkbox"/> If yes , complete (a) and (b).				
	No <input type="checkbox"/> If no , go straight to Question 3.				
(a)	If I did <u>not</u> have diabetes, my working life would be:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	very much better	much better	a little better	the same	worse
(b)	For me, having a working life is:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	very important	important	somewhat important	not at all important	

3 (a)	If I did <u>not</u> have diabetes, local or long distance journeys would be:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	very much easier	much easier	a little easier	the same	more difficult
(b)	For me, local or long distance journeys are:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	very important	important	somewhat important	not at all important	

4	Do you ever go on holiday or want to go on holiday? Yes <input type="checkbox"/> If yes , complete (a) and (b). No <input type="checkbox"/> If no , go straight to Question 5.
(a)	If I did <u>not</u> have diabetes, my holidays would be: <input type="checkbox"/> very much better <input type="checkbox"/> much better <input type="checkbox"/> a little better <input type="checkbox"/> the same <input type="checkbox"/> worse
(b)	For me, holidays are: <input type="checkbox"/> very important <input type="checkbox"/> important <input type="checkbox"/> somewhat important <input type="checkbox"/> not at all important

5 (a)	If I did <u>not</u> have diabetes, physically I could do: <input type="checkbox"/> very much more <input type="checkbox"/> much more <input type="checkbox"/> a little more <input checked="" type="checkbox"/> the same <input type="checkbox"/> less
(b)	For me, how much I can do physically is: <input type="checkbox"/> very important <input type="checkbox"/> important <input type="checkbox"/> somewhat important <input type="checkbox"/> not at all important

6	Do you have family / relatives? Yes <input type="checkbox"/> If yes , complete (a) and (b). No <input type="checkbox"/> If no , go straight to Question 7.
(a)	If I did <u>not</u> have diabetes, my family life would be: <input type="checkbox"/> very much better <input type="checkbox"/> much better <input type="checkbox"/> a little better <input type="checkbox"/> the same <input type="checkbox"/> worse
(b)	My family life is: <input type="checkbox"/> very important <input type="checkbox"/> important <input type="checkbox"/> somewhat important <input type="checkbox"/> not at all important

7 (a)	If I did <u>not</u> have diabetes, my friendships and social life would be: <input type="checkbox"/> very much better <input type="checkbox"/> much better <input type="checkbox"/> a little better <input type="checkbox"/> the same <input type="checkbox"/> worse
(b)	My friendships and social life are: <input type="checkbox"/> very important <input type="checkbox"/> important <input type="checkbox"/> somewhat important <input type="checkbox"/> not at all important

8	Do you have or would you like to have a close personal relationship? Yes <input type="checkbox"/> If yes , complete (a) and (b). No <input type="checkbox"/> If no , go straight to Question 9.
(a)	If I did <u>not</u> have diabetes, my closest personal relationship would be: <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very much better <input type="checkbox"/> much better <input type="checkbox"/> a little better <input type="checkbox"/> the same <input type="checkbox"/> worse </div>
(b)	For me, having a close personal relationship is: <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very important <input type="checkbox"/> important <input type="checkbox"/> somewhat important <input type="checkbox"/> not at all important </div>

9	Do you have or would you like to have a sex life? Yes <input type="checkbox"/> If yes , complete (a) and (b). No <input type="checkbox"/> If no , go straight to Question 10.
(a)	If I did <u>not</u> have diabetes, my sex life would be: <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very much better <input type="checkbox"/> much better <input type="checkbox"/> a little better <input type="checkbox"/> the same <input type="checkbox"/> worse </div>
(b)	For me, having a sex life is: <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very important <input type="checkbox"/> important <input type="checkbox"/> somewhat important <input type="checkbox"/> not at all important </div>

10 (a)	If I did <u>not</u> have diabetes, my physical appearance would be: <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very much better <input type="checkbox"/> much better <input type="checkbox"/> a little better <input type="checkbox"/> the same <input type="checkbox"/> worse </div>
(b)	My physical appearance is: <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very important <input type="checkbox"/> important <input type="checkbox"/> somewhat important <input type="checkbox"/> not at all important </div>

11 (a)	If I did <u>not</u> have diabetes, my self-confidence would be: <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very much greater <input type="checkbox"/> much greater <input type="checkbox"/> a little greater <input type="checkbox"/> the same <input type="checkbox"/> less </div>
(b)	My self-confidence is: <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> very important <input type="checkbox"/> important <input type="checkbox"/> somewhat important <input type="checkbox"/> not at all important </div>

12 (a)	If I did <u>not</u> have diabetes, my motivation would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much greater	much greater	a little greater	the same	less
(b)	My motivation is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

13 (a)	If I did <u>not</u> have diabetes, the way people in general react to me would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	The way people in general react to me is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

14 (a)	If I did <u>not</u> have diabetes, my feelings about the future (e.g. worries, hopes) would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	My feelings about the future are:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

15 (a)	If I did <u>not</u> have diabetes, my financial situation would be:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much better	much better	a little better	the same	worse
(b)	My financial situation is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

16 (a)	If I did <u>not</u> have diabetes, I would have to depend on others when I do not want to:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		very much less	much less	a little less	the same	more
(b)	For me, not having to depend on others is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		very important	important	somewhat important	not at all important	

17 (a)	If I did <u>not</u> have diabetes, my living conditions would be:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	very much better	much better	a little better	the same	worse
(b)	My living conditions are:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	very important	important	somewhat important	not at all important	

18 (a)	If I did <u>not</u> have diabetes, my freedom to eat as I wish would be:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	very much greater	much greater	a little greater	the same	less
(b)	My freedom to eat as I wish is:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	very important	important	somewhat important	not at all important	

19 (a)	If I did <u>not</u> have diabetes, my freedom to drink as I wish (e.g. fruit juice, alcohol, sweetened hot and cold drinks) would be:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	very much greater	much greater	a little greater	the same	less
(b)	My freedom to drink as I wish is:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	very important	important	somewhat important	not at all important	

If there are any other ways in which diabetes, its management and any complications affect your quality of life, please say what they are below:

--

Thank you for completing this questionnaire.

Appendix C

Map of South/Central American, Mexico and Puerto Rico,
and Study Population from Each



Appendix D

Human Subjects Institutional Review Board Letter of Approval

WESTERN MICHIGAN UNIVERSITY



Human Subjects Institutional Review Board

Date: April 14, 2008

To: Kieran Fogarty, Principal Investigator
Janice Long, Student Investigator

From: Amy Naugle, Ph.D., Chair

A handwritten signature in cursive script, appearing to read "Amy Naugle".

Re: HSIIRB Project Number: 08-04-07

This letter will serve as confirmation that your research project entitled "Perceptions of Quality of Life of Latinos and Diabetes Living in the U.S.: Variations by Geographic Region of Origin" has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: April 14, 2009

Appendix E
Permission Letters

Dear Janice

It would be better to use the actual first page of the questionnaire to show the first two items with the correct layout (your layout has unequal distances between the response options) and the copyright information which must accompany any such illustration. You might also include the second page or even the whole questionnaire. However it is essential that you have a 'for information only' banner across any part of the actual questionnaire used and make it absolutely clear that copyright is vested in me, a licence to use the questionnaire was obtained from me and others wishing to use the questionnaire should contact me for permission and information about the latest version. As it stands it is not clear what is reproduction of parts of the questionnaire and what is a summary of the items. There is at least one error in the summary of items (sex life has a NA option but is not shown as such in your attachment). There doesn't appear to be any information about copyright in your attachment and that needs to be corrected. The simplest approach would be to include a 'for information only' version of the questionnaire. Janet will be able to supply this.

I would be glad if you would send us a final version of the information you include about the ADDQoL19 including copyright information and instructions on how to obtain permission to use the questionnaire.

I wish you well with your dissertation and look forward to hearing the outcome.

All best

Clare

Clare Bradley, PhD
 Professor of Health Psychology,
 Department of Psychology,
 Royal Holloway, University of London,
 Egham Hill, Egham, Surrey,
 TW20 0EX, UK
 Tel: +44 1784 443708 (direct) 443714 (admin)
 Fax: +44 1784 471168
 email: c.bradley@rhul.ac.uk
 -----Original Message-----
 From: Janice Long [mailto:jlong@ken.nesaw.edu]
 Sent: 28 July 2008 19:37
 To: Bradley C
 Subject:

Dr. Bradley,

I am finalizing my dissertation and have to turn it in on August 1, this week. I just learned that I will need something in writing before I can use the list of items on the ADDQoL in my dissertation. I am attaching the copy of the document I would like to include as an appendix.

Thank you,

Janice Long

Janice M. Long RN, PhD
Assistant Professor of Nursing
Kennesaw State University
School of Nursing
Office 770 423 6671
Fax 770 423 6627

No virus found in this incoming message.
Checked by AVG - <http://www.avg.com>
Version: 8.0.138 / Virus Database: 270.5.6/1577 - Release Date:
28/07/2008 06:55

From: John Moen
To: 'Janice Long'
Sent: Saturday, July 12, 2008 12:38 AM
Subject: RE: outline map of Latin America

Janice,

Thanks for asking and by all means use the map as stated.

Ciao from Rome!

John O. Moen
Graphic Maps and World Atlas
Via Del Politeama, 33
00153 Rome, Italy
(worldwide) VOIP phone line: 1.409.209.0080
Rome, Italy (map desk) (39) 349.728.1580
jm@graphicmaps.com
<http://graphicmaps.com/custmaps.htm>
<http://worldatlas.com/aatlas/world.htm>

From: Janice Long [mailto:janicelong07@comcast.net]
Sent: Saturday, July 12, 2008 3:57 AM
To: jm@graphicmaps.com
Subject: outline map of Latin America

I am working on my dissertation about Mexico, South America, Puerto Rico and Central America and I wondered if I am permitted to use a copy of your outline map to put in my dissertation to show where the subjects for my study are from. I will not be selling copies. The dissertation will be placed in the library at my university and I will have a copy but I need it to graduate.

Thank you

Janice Long

Cartersville Georgia