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Exploring Oral Health Problems in Adult Hispanic Migrant Farmworkers: A Mixed-Methods Approach

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EXPLORING ORAL HEALTH PROBLEMS IN ADULT HISPANIC MIGRANT FARMWORKERS: A MIXED - METHODS APPROACH

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by

Claudia A. Serna

2014

To: Dean Michele Ciccazzo
R.Stempel College of Public Health and Social Work

This dissertation, written by Claudia A. Serna, and entitled Exploring Oral Health Problems in Adult Hispanic Migrant Farmworkers: A Mixed-Methods Approach, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Elena Bastida, Major Professor

Date of Defense: November 10, 2014

The dissertation of Claudia A. Serna is approved.

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Florida International University, 2014

DEDICATION

I dedicate this dissertation to my parents. Without their devoted and endless love, encouragement, understanding, and support, the completion of this work would not have been possible. They instilled in me the belief that—through hard work and dedication—I could achieve the pursuit of my life's goals. I will forever be grateful for all their love and what they have done for me.

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Last but not least, I would like to thank my parents for always encouraging me to do my best and for their unconditional love and support.

ABSTRACT OF THE DISSERTATION

EXPLORING ORAL HEALTH PROBLEMS IN ADULT HISPANIC MIGRANT FARMWORKERS: A MIXED - METHODS APPROACH

by

Claudia A. Serna

Florida International University, 2014

Miami, Florida

Professor Elena Bastida, Major Professor

This mixed-methods study explored patterns of dental health care utilization in adult Hispanic migrant farmworkers (AHMFW) with special emphasis on non-compliance with the American Dental Association (ADA) and the American Dental Hygienists Association (ADHA) recommendation of visiting the dentist at least once a year; while also examining the social and cultural construction of oral health.

A total of 278 participants took part in the quantitative arm of the study. Binary and hierarchical logistic regression analysis were employed in identifying predisposing, enabling, and needs factors associated with time since last dental visit (over a year or non-compliant). The qualitative arm consisted of conducting fourteen ethnographic interviews with survey participants who volunteered for this phase of the study.

Most farmworkers (79.5%) reported being non-compliant with the ADA and the ADHA recommendation. Binary logistic regression results indicated that AHMFW who reported need for dental treatment were compliant with the recommendation. While those who brushed their teeth more often, experienced oral health impact regular and most of the time, and reported poor perception of the condition of the mouth were non-compliant

with the recommendation. Hierarchical logistic regression results pointed to those who used floss and reported needing dental treatment as compliant with the recommendation. In contrast, AHMFW who reported poor perception of the condition of the mouth were non-compliant. Eight themes emerged from the qualitative analysis (understanding of the mouth, meaning of oral health, history of dental care; dental problems, barriers to dental care, taking care of the teeth/mouth, medications, oral health quality of life).

Farmworkers were knowledgeable of oral health, however, this knowledge, particularly the practice of brushing twice a day, made them less likely to seek regular dental care. Ultimately, a dental visit hinged on their limited finances, lack of dental insurance and family responsibilities. Together, these decreased access to preventive dental services and increased risk of experiencing oral health problems.

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CHAPTER I

INTRODUCTION

It is estimated that there are over one million farmworkers in the United States; despite their contributions to the U.S. economy, they are often ignored as they are among the most economically disadvantaged in the nation (Carroll, Georges, & Saltz, 2011; National Center for Farmworker Health, 2012b). Farmworkers support the United States' 28 billion dollar fruit and vegetable industry. Migrant farmworkers include individuals engaged in field and orchard agriculture, packing and sorting procedures in food processing; horticultural specialties (including nursery operations, greenhouse activities and crops grown under cover) and reforestation (Carroll et al., 2011; Hawkins, 2001; Kandel, 2008; National Center for Farmworker Health, 2012b).

Migrant farmworkers come from different countries; in general large numbers come from Mexico and Central America. Similar to other ethnic minorities in the U.S., migrant farmworkers suffer from adverse health conditions and inadequate access to quality health care services (Anthony, Martin, Avery, & Williams, 2010; Arcury & Quandt, 2007; Carroll et al., 2011; Connor, Rainer, Simcox, & Thomisee, 2007; Connor, Layne, & Thomisee, 2010; Frank, Liebman, Ryder, Weir, & Arcury, 2013; Hansen & Donohoe, 2003; Human Services, 2000; National Center for Farmworker Health, 2012b; Poss & Pierce, 2003; Villarejo et al., 2010). They are recognized as a medically underserved population because they suffer from chronic health conditions such as tuberculosis, diabetes, heart disease, hypertension, anemia, obesity, adverse pregnancy outcomes and

chronic oral infections. Furthermore, since many of them have not had a medical evaluation in the past, they are unaware of such conditions and many times these health problems aggravate and become severe. Also, access to care is often impacted by their poor living conditions, lack of transportation, long working hours, language, cultural barriers and low educational levels (Arcury & Quandt, 2007; Centers for Disease Control, 1992a; Connor et al., 2010; De Jesus Diaz-Perez, Farley, & Cabanis, 2004; Fallon, Schmalzried, & Earlie-Royer, 2012; Frank et al., 2013; Hansen & Donohoe, 2003; Hoerster, Beddawi, Peddecord, & Ayala, 2010; Hoerster et al., 2011; Holmes, 2012; National Center for Farmworker Health, 2012b; Price et al., 2013; Scott & Simile, 2005; Shehadeh & McCoy, 2013; Shehadeh, McCoy, Rubens, Batra, Renfrew, & Winter, 2012; Slesinger, 1992; Villarejo, 2003; Villarejo et al., 2010).

The majority of studies on migrant farmworkers have been quantitative in nature. These studies include assessing health status such as human immunodeficiency virus (HIV) risk behaviors, tuberculosis, cancer, mental, occupational health, nutrition and dental care (Finlayson, Gansky, Shain, & Weintraub, 2010; Lukes & Simon, 2006; Magana & Hovey, 2003; McCoy, Hlaing, Ergone-Rowe, Samuels, & Malow, 2009; Organista, Carrillo, & Ayala, 2004; Poss & Pierce, 2003; Rubens, McCoy, Shehadeh, 2013; Sánchez, De La Rosa, & Serna, 2013; Sánchez, Serna, & De La Rosa, 2012; Sanchez, Silva-Suarez, Serna, & De La Rosa, 2012). Though lesser in number, qualitative studies examine the health needs, services, nutrition and barriers. In addition, they have also explored oral health inequalities and barriers to oral health care (Bechtel, Shepherd, & Rogers, 1995; Carrion, Castañeda, Martinez-Tyson, & Kline, 2011; Cason, Snyder, &

Jensen, 2004; Castañeda, Carrion, Kline, & Tyson, 2010; Decker & Knight, 1990; Perilla, Wilson, & Wold, 1998).

The Health Resources and Services Administration (2011) and the National Center for Farmworker Health (2013) identify oral health problems as the most salient issue among migrant farmworkers. Oral disease is a neglected condition that can impact an individual's overall health, including their physical, mental and emotional well-being. Untreated caries, periodontal disease and missing or broken teeth are some of the most common problems presented by adult migrant farmworkers (Arcury & Quandt, 2007; National Center for Farmworker Health, 2009b, 2013; Villarejo, 2003). Despite the importance attributed to their oral health, ranked as one of the major health problems of this population, little information is available concerning dental health needs and access to dental care of migrant farmworkers (Arcury & Quandt, 2007; Call, Entwistle, and Swanson, 1987; Lukes & Simon, 2005, 2006; Nurko, Aponte-Merced, Bradley, & Fox, 1998; Quandt, Hiott, Grzywacz, Davis, & Arcury, 2007b; Woolfolk, Hamard, Bagramian, & Sgan-Cohen, 1984).

The majority of the literature on migrant farmworkers is concentrated on the oral health status and treatment of Hispanic migrant children. Research findings consistently report that farmworkers' children have better oral health than their parents because they receive more treatment. However, migrant children still experience more oral health problems than the general U.S. population; experiencing 150% to 300% more tooth decay than their peers (Koday, Rosenstein, & Lopez, 1990; Lukes & Simon, 2005; Nurko et al., 1998; Quandt, Clark, Rao, & Arcury, 2007a; Woolfolk et al., 1984; Woolfolk, Sgan-Cohen, Bagramian, & Gunn, 1985). Information on adult migrant farmworkers is

limited, the few studies available show high unmet needs for dental care among this population; and limited epidemiological data are available (Entwistle & Swanson, 1989; Finlayson et al., 2010; Lukes & Miller, 2002; Lukes & Simon, 2005; Villarejo et al., 2000). The few available studies indicate that low educational level, low income, and lack of dental insurance decrease their ability to access preventive services and this increases the risk of experiencing oral health problems (Arcury & Quandt, 2007; Entwistle & Swanson, 1989; Healthy People, 2013, 2020; Lukes & Miller, 2002; Lukes & Simon, 2005, 2006; National Center for Farmworkers Health, 2013; Seirawan, 2008).

Significance of the Study

Oral health is a significant component of overall health. Good oral health is essential for an individual's well-being. Oral diseases can affect the ability of individuals to carry out essential functions such as eating and speaking (Castañeda, Ruiz, Ramos-Gómez, & Ojeda, 2010 ; Kaiser Family Foundation, 2012; US Department of Health and Human Services, 2000; World Health Organization, 2012). Migrant farmworkers present a higher prevalence of oral diseases than the national average; and these oral diseases are among the top health problems for which migrant farmworkers are treated (Castañeda et al., 2010b; Frank et al., 2013; Luke & Miller, 2002; Quandt et al., 2007; US Department of Health and Human Services, 2000).

The interplay of characteristics such as cost, time, transportation and language barriers when combined with everyday concerns such as housing, food, and clothing, play an important role in prevalence of oral disease and utilization of dental services in this population (Arcury & Quandt, 2007; Entwistle & Swanson, 1989; Healthy People 2013, 2020; Lukes & Miller, 2002; Lukes & Simon, 2005, 2006; National Center for

Farm Workers Health, 2013; Seirawan, 2008). Based on the high prevalence of oral disease, migrant farmworkers' quality of life may be reduced as a result of pain and suffering, impairment of function and the interrelation between oral and general health (Arcury & Quandt, 2007; Centers for Disease Control and Prevention, 2013a; Entwistle & Swanson, 1989; Lukes & Miller, 2002; National Center for Farmworkers Health, 2009; Petersen, 2003; Poss & Pierce, 2003; Quandt et al., 2007).

The current mixed-methods study is well-positioned to make a contribution to the limited amount of research on adult Hispanic migrant farmworkers' oral health. Furthermore, this study also highlights the importance of assessing farmworkers' patterns of dental health care utilization while also examining the social and cultural construction of oral health. Prior studies (Entwistle & Swanson, 1989; Finlayson et al., 2010; Lukes & Miller, 2002; Lukes & Simon, 2006; Poss & Pierce, 2003; Quandt et al., 2007; Villarejo et al., 2000) indicate that a significant proportion of migrants farmworkers fail to follow the American Dental Association (ADA) and the American Dental Hygienists Association (ADHA) recommendation of visiting the dentist at least once a year to prevent oral health problems (American Dental Association, 2014; American Dental Hygienists Association, 2007; Doty, & Weech-Maldonado, 2003; Kuthy, Odom, Salsberry, Nickel, & Polivka,1998). A better understanding of migrant farmworkers' construction of oral health should expand knowledge regarding their reasons for not complying with the ADA and the ADHA recommendation and provide dental public health professionals with the necessary information to develop better prevention strategies.

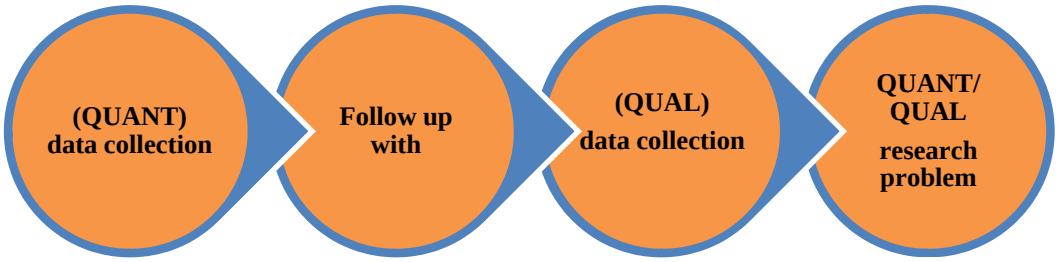
Purpose of the Study

The purpose of this mixed-methods study is to explore patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation of visiting the dentist at least once a year, while also examining the social and cultural construction of oral health (American Dental Association, 2014; American Dental Hygienists Association, 2007; Doty, & Weech-Maldonado, 2003; Kuthy, Odom, Salsberry, Nickel, & Polivka, 1998).

In order to investigate the questions of interest, a sequential mixed-methods explanatory design (Creswell, Plano Clark, Gutmann, & Hanson, 2003; Tashakkori & Teddlie, 1998) was identified following careful review of the research design literature. This method was found to provide procedures for generating data required to explore the questions vital to this investigation. Generally speaking, the mixed-methods sequential explanatory design proposes a sequential approach to data collection and analysis beginning with the quantitative phase of the data collection, followed by the collection of qualitative data (Creswell, 2005; Tashakkori & Teddlie, 2003) (see Figure 1). The rationale for mixing both types of methods (first quantitative and then qualitative) is based on the fact that qualitative findings should provide much needed insight into the participants' perspective on patterns of dental health care utilization while also examining the social and cultural construction of oral health. In addition, neither quantitative nor qualitative procedures are sufficient by themselves to generate the data necessary to capture the details of the research problem. In the past, several authors employed this methodology in social and behavioral sciences research (Creswell et al., 2003; Green &

Caracelli, 1997; Greene, Caracelli, & Graham, 1989; Miles & Huberman, 1994; Tashakkori & Teddlie, 1998).

Figure1. Mixed-methods sequential explanatory design



Data for this study were drawn from a population participating in a parent study "HIV Risk Reduction in High Risk Hispanic Migrant Workers in South Florida," housed at the Center for Research on U.S. Latino HIV/AIDS and Drug Abuse (CRUSADA), funded by the National Institute on Minority Health and Health Disparities (NIMHD) and conducted by Dr. Jesus Sanchez while at Florida International University (FIU). The oral health component, the main focus of the present study, was added at the nine-month follow-up of the parent study. The quantitative oral health phase of the present study consisted of a survey questionnaire framed within Andersen's Behavioral Model of Health Services Utilization (Andersen, 1968). This approach assesses the relationship between its major constructs: predisposing (e.g., age, gender, relationship status); enabling (e.g., acculturation, health insurance) and need factors (e.g., self-perceived need for care, disability, health symptoms), and health care-seeking behavior. Likewise, data for the oral health qualitative phase of this study came from the supplement of the parent

study and consisted of ethnographic interviews designed to further expand on responses to the closed ended quantitative questions. The mixed-methods analysis employed here should provide tools to explore patterns of dental health care utilization while also examining the social and cultural construction of oral health among this population.

Theoretical Perspective

This study draws extensively from Andersen's Behavioral Model, first proposed in 1968 to explain access to health services in the U.S. (Andersen, 1968). This model has been widely used as a framework to predict health care use since its inception (Andersen et al., 2000; Babitsch, Gohl, & von Lengerke, 2012; Baker, 2009; Feldman et al., 2009; Finlayson et al., 2010; Gelberg, Andersen, & Leake, 2000; Gilbert et al., 2002; Guendelman, 1991; Hoerster et al., 2010; Kaylor, Polivka, Chaudry, Salsberry, & Wee, 2010; Kim, Jang, Chiriboga, Ma, & Schonfeld, 2010; Phillips, Morrison, Andersen, & Aday, 1998). In one or another format, it has been applied to a broad range of health services sectors, racial and ethnic populations, and a variety of diseases, e.g., long-term care, nursing homes, HIV, mental health, skin disease and dental care. Additionally, it has been used in vulnerable populations such as migrant farmworkers in order to identify particular challenges they face in obtaining needed services (Andersen et al., 2000; Babitsch et al., 2012; Baker, 2009; Feldman et al., 2009; Finlayson et al., 2010; Gelberg et al., 2000; Gilbert et al., 2002; Guendelman, 1991; Hoerster, et al., 2010; Kaylor et al., 2010; Kim et al., 2010; Phillips et al., 1998).

This model views access to services as a result of decisions made by individuals, resulting from understandings that are constrained by their position in society and the

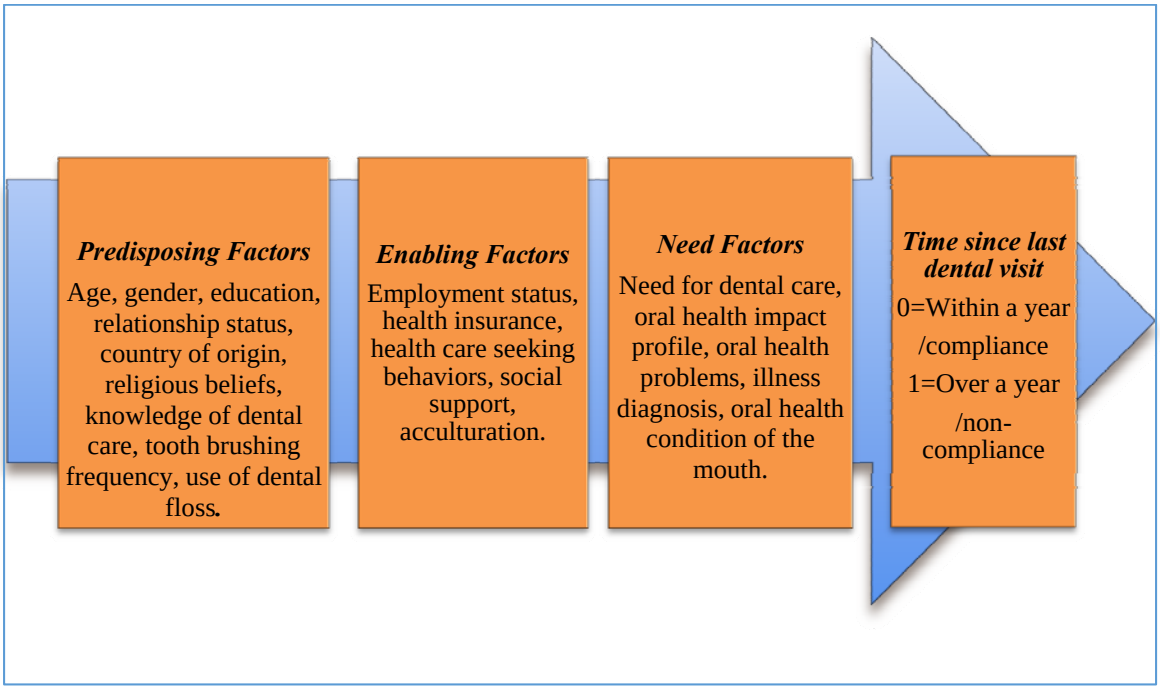
availability of health care services (Andersen & Newman, 1973; Babitsch et al., 2012). It focuses on the individual as the unit of analysis and measures the joint effect of factors in the perspective domain of the model. It also suggests that people's use of health services is a function of factors such as predisposing, enabling and need (Andersen & Newman, 2005; Babitsch et al., 2012). Moreover, the entire model can explain the process of health care utilization as well as each component: predisposing, enabling and need factors making an independent contribution to predict use (Andersen, 1995; Andersen et al., 2000; Bustamante et al., 2012; Gelberg et al., 2000; Hoerster et al., 2010).

The outcome of the original model (Andersen, 1968) is health service use, however measured. The purpose behind the model is to identify conditions that either facilitate or impede utilization of health services. The model hypothesize that predisposing, enabling and need factors would have the differential ability to explain use depending on what type of service was examined. For example, hospital services would be primarily explained by predisposing and need factors, while dental services would more likely be explained by predisposing and enabling factors (Andersen, 1995; Andersen & Newman, 2005; Babitsch et al., 2012; Gelberg et al., 2000).

As applied to oral health research (see Figure 2), predisposing factors are those that exist prior to the oral disease including age, sex, race, education, occupation, ethnicity, personal health beliefs and behaviors. Enabling factors refer to resources that affect an individual's ability to access dental health care services, including family and community resources (e.g., household income, dental insurance, access to a dental home). Furthermore, need refers to those factors that reflect oral health problems, illnesses and

perceived needs that require the use of dental services. Predisposing, enabling and need factors have been found to be determinants of dental care utilization (Andersen & Newman, 2005; Atchison, Davidson, & Nakazono, 1997; Babitsch et al., 2012; Baker, 2009; Finlayson et al., 2010; Gilbert et al., 2002; Nahouraii, Wasserman, Bender, & Rozier, 2008). In these studies (Guiney, Woods, Whelton, & Morgan, 2011; Kaylor et al., 2010; Finlayson et al., 2010) the outcome variable has been operationalized as dental utilization in the previous year (yes or no). The ADA and the ADHA recommend that healthy adults visit the dentist at least once a year to prevent oral health problems. Dental visit in the past 12 months is a common indicator of oral health utilization in the literature (American Dental Association, 2014; American Dental Hygienists Association, 2007; Doty, & Weech-Maldonado, 2003; Kuthy, Odom, Salsberry, Nickel, & Polivka, 1998).

Figure 2. Andersen's Behavioral Model of Health Services Utilization (1968)



Finally, Andersen's model has been criticized because of lack of attention to environmental interactions as predictors of health care utilization (Scheppers, Van Dongen, Geertzen, & Dekker, 2006). While there are new versions of Andersen's model (Aday & Andersen, 1974; Andersen, 1995; Gelberg, Andersen, & Leake, 2000) that address these criticisms, these were not selected for this study because the focus here is on the individual determinants of health care utilization and not on measures of health care system, health services, consumer satisfaction or health outcomes. Additionally, the constructs selected from Andersen's model to guide the current investigation were purposefully chosen because of their earlier use in the limited work in this field (Andersen & Newman, 2005; Finlayson et al., 2010; Nahouraii et al., 2008; Lo & Fulda, 2008). Though major risk factors for poor oral health such as unhealthy diet, tobacco use, and frequent alcohol use (Centers for Disease Control and Prevention, 2013b; National Center for Farmworker Health, 2013) are very much recognized, they were not addressed here; nor were they entered in the model, as this study is not based on lifestyle behaviors. It is stressed here that the comparability of expected findings with those yielded by prior studies is of utmost relevance to this research, since it is expected that results from this study will assist in building a more complete epidemiological profile of the oral status health of this population.

Research Questions

Phase I Quantitative

Study variables were selected on the basis of Andersen's Behavioral Model (Andersen, 1968; Andersen, 1995). The model is composed of three constructs measured

by a set of variables: (1) predisposing factors (e.g., age, gender, relationship status), (2) enabling factors (e.g., acculturation, health insurance), and (3) need factors (e.g., self-perceived need for dental treatment, oral health impact prolife, oral health problems, and illnesses diagnosis). The purpose of this mixed-methods study is to explore patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation, while also examining the social and cultural construction of oral health. For the quantitative phase of the study, the outcome variable (time since last dental visit) was defined by the time elapsed since the participant's last dental visit prior to study enrollment, obtained by the following question: “How long has it been since your last visit for dental care?” For purposes of analysis, this variable was categorized as having last visited the dentist within a year (compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year) and over a year (non-compliance with the ADA and the ADHA recommendation) (see Table 1).

Quantitative Research Question

(Question 1). *To what extent are predisposing (e.g., age, gender, relationship status) enabling (e.g., acculturation, health insurance) and need factors (e.g., self-perceived need for dental treatment, oral health impact profile on a regular basis and most of the time, oral health problems, illness diagnosis) associated with adult Hispanic migrant farmworkers’ time since last dental visit?*

Table 1. Predisposing, enabling and need factors

Outcome Variable **(Time since last dental visit)**	Group	Predictor variables
0= Within a year (Compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year)	Predisposing	Age, gender, education, relationship status, country of origin, religious beliefs, knowledge of dental care, tooth brushing frequency, use of dental floss.
	Enabling	Employment status, health insurance, health care seeking behavior, social support, acculturation.
1= Over a year (Non-compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year)	Need	Self-perceived need for dental treatment, oral health impact profile on a regular basis, and most of the time, oral health problems, illness diagnosis, self-perceived oral health condition of the mouth.

Hypotheses

Based on the review of the literature, the following research hypotheses are posed in relation to the research question. Each hypothesis is composed of different factors. Each factor was addressed separately in the statistical analysis.

Hypothesis 1. All variables considered as part of Andersen's model under the three different domains, will be significantly associated with time since last dental visit. For testing this hypothesis a binary logistic regression analysis was used.

Hypothesis 2. Based on Andersen's Model, the following sets of predictors: (Model 1) predisposing factors, (Model 2) predisposing and enabling factors, and (Model 3) predisposing, enabling and need factors, will be significantly associated with time since last dental visit. A hierarchical logistic regression analysis is used to test the second hypothesis.

Phase II Qualitative

For purpose of this study, qualitative methods, as employed here, contributes toward expanding the understanding of farmworkers' patterns of dental health care utilization with special emphasis on those who did not comply with ADA and ADHA recommendation of visiting the dentist at least once a year, while also examining the social and cultural construction of oral health.

Qualitative Research Questions

(Question 2). *In particular, what is the social construction of "the mouth," as perceived by this sub-group of the Hispanic population?*

(Question 3). *What is the Hispanic migrant farmworker construction of oral health?*

(Question 4). *What are the cultural patterns of dental health utilization?*

(Question 5).*What is the shared social and cultural construction of oral health care among this group?*

(Question 6). What is the impact of oral health problems on the quality of life of farmworkers?

Mixed - Methods

The synergy from the interplay of both data sources (quantitative and qualitative) should provide a more in-depth exploration of farmworkers' patterns of dental health care utilization with special emphasis on those who did not comply with ADA and ADHA recommendation of visiting the dentist at least once a year, while also examining the social and cultural construction of oral health.

Mixed-Methods Research Question

(Question 7). *How does a mixed-methods approach, as employed here, expand current knowledge and overall perspective of the oral health of this underserved population? Furthermore, how does this synergistic approach broaden our understanding of the various aspects underlying the oral health of this group?*

Definitions

The following definitions are employed throughout the study:

- Hispanic or Latino is a member of an ethnic group that traces its roots to 20 Spanish-speaking nations from Latin America and Spain (Passel & Taylor, 2009).
- A migrant farmworker is defined as "an individual whose principal employment is in agriculture on a seasonal basis, and who has been employed within the last twenty-four months" (U.S. Code, Public Health Services Act, "Migrant Health," 2005).
- Mixed-methods sequential explanatory design implies collecting and analyzing first quantitative and then qualitative data in sequential phases (Creswell, 2005; Tashakkori & Teddlie, 2003).
- Access refers to the availability and utilization of health care by migrant farmworkers (Hunter et al., 2003).
- Health care is the primary care services available at doctor's offices, the public health department and the migrant health services clinics (Villarejo, 2003).
- Barriers are obstacles preventing the migrant farmworker from obtaining appropriate medical care (De Jesus Diaz-Perez et al., 2004).

- Ethnographic interview is a form of interviewing conducted in the context of a relationship with interviewees with whom the researcher has, through an ongoing presence, established relations of rapport and respect sufficient for a genuine 'meeting of minds' and that enable a mutual exploration of the meanings the interviewee applies to their social world (Heyl, 2001).
- Oral health is a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity. Risk factors for oral diseases include unhealthy diet, tobacco use, harmful alcohol use, and poor oral hygiene (World Health Organization., 2012).
- Compliance refers here to study participants who follow the ADA and the ADHA recommendation of visiting the dentist at least once a year to prevent oral health problems (American Dental Association, 2014; American Dental Hygienists Association, 2007; Doty, & Weech-Maldonado, 2003; Kuthy, Odom, Salsberry, Nickel, & Polivka, 1998).
- Non-compliance refers to study participants who do not follow the ADA and the ADHA recommendation of visiting the dentist at least once a year to prevent oral health problems (American Dental Association, 2014; American Dental Hygienists Association, 2007; Doty, & Weech-Maldonado, 2003; Kuthy, Odom, Salsberry, Nickel, & Polivka, 1998).

Summary

This study explores patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation, while also examining the social and cultural construction of oral health. Given the sparse information and research studies on the oral health of this population, it is anticipated that findings from this study, both quantitatively and qualitatively, will yield important and missing information relevant to the construction of an epidemiological profile of the oral health of adult Hispanic migrant farmworkers in South Florida. Moreover, it is expected that the synergy that results from the interplay of both data sources will make a novel contribution to the current understanding of Hispanic oral health and advance the current oral health research literature.

The next chapter will review past and current literature on adult Hispanic migrant farmworkers' health and oral health problems as discussed above in the research questions.

CHAPTER II

LITERATURE REVIEW

Hispanics in the United States

Demographics

There are 50.5 million Hispanics in the United States, 16.3% of the total population, making people of Hispanic origin the nation's largest ethnic minority (Daviglus et al., 2012). Among Hispanics, those of Mexican origin represent 71% of the total Hispanic population residing in the United States, followed by Puerto Ricans (9%), Cubans (3%), and the remaining (17%) were people of other Hispanic origins (U.S. Census Bureau, 2010).

Over half of the Hispanic population in the United States resides in just three states: California, Texas and Florida. Hispanics in Florida account for 4.2 million (8%) of the U.S. population (U.S. Census Bureau, 2010). There are 1.6 million Hispanics residing in Miami-Dade County (Ennis et al., 2011; Humes et al., 2011; Passel, Cohn, & Lopez, 2011). Hispanics compared with their non-Hispanic counterparts are less likely to finish high school and are more likely to be poor, unemployed and uninsured. In addition, approximately 22% of Hispanics live below the federal poverty line and those from Mexico and Central America have the lowest income (Mejia et al., 2008; Ramos-Gómez, Cruz, Watson, & Boneta, 2005; Vega, Rodriguez, & Gruskin, 2009).

Health Conditions

When discussing the health status of the U.S. population, members of ethnic minority groups and those of lower socio-economic status are those who experience the greatest disease burden. Consequently, Hispanic health status is often the result of cumulative factors such as language/cultural barriers, lack of access to preventive care and health insurance as well as degree of acculturation and duration of residency in the United States (Daviglus et al., 2012; Guendelmam, 1998; Office of Minority Health, 2012).

Hispanic adults have more chronic health conditions when compared to the U.S. adult population (Livingston, Minushkin, & D'Vera, 2008). Hispanics suffer from higher morbidity rates than non-Hispanics for diabetes, weight gain, and high blood pressure (American Diabetes Association, 2013; Daviglus et al., 2012; Schneiderman, 2013). In addition, other health conditions that significantly affect Hispanics include asthma, chronic obstructive pulmonary disease, HIV/AIDS, obesity and liver disease.

They are also more likely to have tuberculosis, allergies, stroke, sexually transmitted diseases and a slightly higher alcoholism rate (Centers for Disease Control, 2011). Finally, a recent and ongoing study funded by the National Institute of Health (NIH) which included 16,415 Hispanics found high prevalence of asthma and diabetes among Hispanic sub-groups (Schneiderman, 2013).

Access to Care

Specific underlying conditions play a significant role in Hispanic access to health care (Livingston et al., 2008). Language and low education may impair people's ability to navigate the complex health care delivery system, as well as to communicate with health care providers. Furthermore, low-income people are less able to afford out-of-pocket costs of care, even when they have health insurance coverage (Mejia et al., 2008).

Hispanics have the lowest rates of health insurance of all ethnic groups, 40% of Mexicans lacked health insurance in 2006. In addition, they were less likely to access and utilize health care compared to U.S. born non Mexican Hispanics (Bastida et al., 2008; Bustamante et al., 2012; Castañeda et al., 2010b; Vega et al., 2009). Moreover, Hispanics reported decreased odds of having a regular source of care such as visiting a physician, having a physical exam, a mammogram, or an influenza vaccination in the previous year (Escarce & Kapur, 2006; Fiscella, Franks, Doescher, & Saver, 2002; Livingston et al., 2008; Lo & Fulda, 2008; Treviño, 1991).

Hispanics Migrant Farmworkers in the United States

Demographics

More than three million migrant and seasonal farmworkers are estimated to be in the United States and approximately one million of those are farmworkers. Migrant farmworkers have a unique lifestyle that usually centers on agricultural work which includes fruits, vegetables, horticulture and field crops (Anthony et al., 2010; Carroll et

al., 2011; Gavaldon, Bagramian, & Inglehart, 2010; National Center for Farmworker Health, 2012b).

Among all farmworkers, 78% were born outside the United States: 75% were born in Mexico, 2% were from Central American countries, and 1% of the farmworkers were from elsewhere. Farmworkers in the United States have an average age of 36 with 76% of them being over 25 years old. In addition, 78% are male and 22% female. Fifty nine percent; report being married, 35% are single and 6% are divorced, separated, or widowed. On average, the highest grade of education completed is the 8th grade. Additionally, the annual income per farmworker ranges between $12,500 and $14,999. Spanish is the predominant language spoken by this population (Anthony et al., 2010; Carroll et al., 2011; National Center for Farmworker Health, 2012b; Villarejo et al., 2010).

Health Conditions

Migrant farmworkers are a vital component of the U.S. agricultural industry. Despite their important contributions, they are known to be a marginalized population who live in poverty and have poor health indicators (Anthony, Williams, & Avery, 2008; National Center for Farmworker Health, 2009a). As a result of working 12 or more hours a day, six days per week, many farmworkers are at a greater risk for many health conditions (Anthony, et al., 2008; Anthony et al., 2010; Hansen & Donohoe, 2003; Poss & Pierce, 2003). They also deal with unique health vulnerabilities such as occupational hazards that include pesticide exposure and traumatic injuries to the skin and eyes (Arcury & Quandt, 2007; Connor et al., 2007; Connor et al., 2010; Frank et al., 2013; Gavaldon et al., 2010).

In addition, they face poor nutrition, substandard living conditions, language and cultural barriers (Anthony et al., 2008; Arcury & Quandt, 2007; Frank et al., 2013; Hansen & Donohoe, 2003; Rothenburg, 1998; Rosenbaum & Shin, 2005; Sandhaus, 1998; Vallejos et al., 2011).

Previous studies conducted by Finch, Catalano, Novaco, Vega (2003),Grzywacz et al. (2006), Hovey & Magana (2000), and Magana & Hovey (2003) found that migrant farmworkers suffer from psychological stressors in addition to physical ones due to discrimination, long working hours, fear of unemployment and underemployment, separation from their families, and limited social support. Moreover, Fernandez, Collazo, Hernandez, Bowen, Varga (2004), Jones et al. (1991), and Organista & Organista (1997) reported that this population has predisposing risk factors associated with HIV/AIDS primarily among the young, single men in labor camps who face social isolation and have limited recreational facilities. Furthermore, they suffer from multiple conditions such as mental illnesses, substance abuse, tuberculosis, diabetes, heart disease, hypertension, anemia, obesity, adverse pregnancy outcomes, cancer and chronic oral infections (Anthony et al., 2008; Arcury & Quandt, 2007; Centers for Disease Control, 1992a; Connor et al., 2010; Coughlin & Wilson, 2002; Frank et al., 2013; Gavaldon et al., 2010; Hansen & Donohoe, 2003; Hoerster et al., 2011; Holmes, 2012; Poss,1999; Price et al., 2013; Scott & Simile, 2005; Slesinger, 1992; Villarejo et al., 2010).

Access to Care

Migrant farmworkers are among the most underserved populations in the United States due to a high prevalence of chronic diseases, yet they have limited access to health

care (Hoerster et al., 2011; Price et al., 2013). They experience the same difficulty in accessing health care as do most other U.S. Hispanics (Hansen & Donohoe, 2003; Poss & Pierce, 2003; Rothenburg, 1998; Scott & Ni, 2004).

Regarding barriers to care, Hansen & Donohoe (2003), Rosenbaum & Shin (2005), and Shenkin (1974) have listed many obstacles that limit migrant farmworkers access to health care, including dental care. Among these problems they found mobility, discrimination, unhealthy environment, and poverty. Additionally, they mentioned lack of transportation, cost, no sick leave, fear of job loss, communication problems (language), low literacy, cultural barriers, lack of time, and limited clinic hours (Anthony et al., 2008; Arcury & Quandt, 2007; De Jesus Diaz Perez et al., 2004; Fallon et al., 2012; Feldman et al., 2009; Frank et al.,2013; Gavaldon et al., 2010; Hansen & Donohoe, 2003; Hoerster et al., 2010; Hoerster et al., 2011; National Center for Farmworker Health, 2012b; New York State Department of Health, 2007; Petersen, 2003; Price et al., 2013; Rosenbaum & Shin, 2005; Scott & Simile, 2005; U.S. Department of Health and Human Services, 2000; Villarejo, 2003). Moreover, farmworkers do not receive paid time off for health care; hence they do not seek care until their illness becomes unbearable since utilizing health services interferes with their job. Furthermore, they are not likely to seek preventive care when no symptoms or problems exist (Arcury & Quandt, 2007; Slesinger, 1992). In addition, their cultural health beliefs affect their utilization of health services, choosing traditional remedies over prescription medicines when they present any health problem (Anthony et al., 2010; Arcury & Quandt, 2007; Connor et al., 2010; Feldman et al., 2009; Poss, Pierce, & Prieto, 2005). Finally, many farmworkers prefer to delay health

care until they return to their home countries as treatment there is cheaper (Brown, 2008; Seid, Castaneda, Mize, Zivkovic, & Varni, 2003).

In the United States, there are health clinics that provide primary care services to migrant and seasonal farmworkers through the Federal Health Center Program (Health and Resources Services Administration, 2011; Rosenbaum, & Shin, 2005). These clinics are required to provide certain medical, dental, pharmaceutical and mental health services (Frank et al., 2013). Although these clinics exist, many farmworkers do not take advantage of these services (Rosenbaum & Shin, 2005) as only 20% of migrant farmworkers have sought care in these institutions in previous years (Connor et al., 2010). Some of the known reasons to low utilization include lack of knowledge about services, undocumented status, cannot miss work, or lack of ability to afford minimal co-payments.

Most farmworkers do not have health insurance; many times they do not meet the eligibility criteria as their income may fluctuate from season to season, do not have proof of address or their employers do not report their wages (Frank et al., 2013; Hansen & Donohoe, 2003; Hoerster et al., 2011; Holmes, 2012; Poss & Pierce, 2003). A study conducted by Rosenbaum and Shin (2005) on a subsample of approximately 1,400 migrant farmworkers, found that 85% of farmworkers were uninsured and only 20% reported the use of any health care service in the preceding two years. Another study conducted by Hoerster et al. (2011) in which they analyzed the National Agricultural Workers Survey between 2006 and 2007 on a sample of 2,884 farmworkers found that approximately 55.3% have utilized health care services in the previous two years.

Hispanic Migrant Farmworkers in Florida

Demographics

There is an estimated 104,759 farmworkers in Florida as of 2011 (Shimberg Center for Affordable Housing, 2013). From this number, 37%, or 38,761, are estimated to be migrant farmworkers (United States Bureau of Labor Statistics, 2011). The counties with more than 2,500 farmworkers in the state are Hillsborough, Miami-Dade, Palm Beach, Manatee, Hendry, Collier, Orange, Indian River, Lee, Polk, Highlands, and Volusia. Combined, these counties contain 81% of the state's farmworkers. Miami-Dade County ranks second in the state with 16,258 migrant farmworkers with more than 85% or 13,819 being of Hispanic origin (Shimberg Center for Affordable Housing, 2013).

The average age of farmworkers in Florida is 31 years old. Overall, one quarter of farmworkers are women and approximately one-half of all farmworkers are married. Migrant farmworkers in Florida are almost exclusively of Hispanic origin with 86% being of Mexican descent and 83% declaring Spanish as their primary language. In addition, the average number of years of school completed by Florida farmworkers is almost eight. Statistically 66% of Florida farmworkers household are living at or below the poverty threshold with an individual income less than $10,000 per year (Abernathy, 2010). Additionally, regarding living conditions, Hispanic migrant farmworkers live in camps that encompass trailer parks, dormitory-style housing, apartment buildings, motels, duplexes and neighborhoods of single/duplex housing located within a 10-mile radius of the town closest to the area of work (Arrieta, Walker, & Mason, 1998; Carroll,

Samardick, & Scott Bernard, 2005; Flocks, Theis, Bagby, & Burns, 2002; Florida. Dept. of Agriculture & Consumer Services, 2005).

Health Conditions

Farmworkers in Florida present the same health conditions as other migrant farmworkers in the U.S. including: syphilis, tuberculosis, heart disease and hypertension. Farmworkers also suffer from high rate of toxic chemical injuries, skin disorders and respiratory illness (Bleiweis, Reynolds, Cohen, & Butler, 1977; Cameron et al., 2006; Centers for Disease Control, 1992a; Flocks, Monaghan, Albrecht, & Bahena, 2007; Kamel, 2003). Researchers have found that farmworkers in Florida are at a greater risk for HIV infection due to their lack of use of condoms which is a direct result of their low level of education (Fernandez et al., 2004; Fernandez et al., 2005; McCoy et al., 2009; Rubens et al., 2009; Sánchez et al., 2012a; Sanchez et al., 2012b; Sánchez et al., 2013).

Access to Care

Although in the state of Florida there are approximately 60 migrant health centers, many farmworkers do not take advantage of their services. Some of the reasons are lack of proper documentation, or in many cases, lack of knowledge about the existence of these clinics. Other obstacles that they encounter are waiting for an appointment, limited clinic hours, out-of-pocket expenses and inability to communicate with the clinic's staff (Dwyer, 2006; National Center for Farmworkers Health, 2012). In addition, Florida farmworkers prefer to practice in-home care with the use of traditional herbal medicine based on their cultural beliefs (Baer & Bustillo, 1998; Baer & Penzell, 1993).

Oral Health in the United States

Oral health is a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity (World Health Organization., 2012). Oral health disparities exist for many racial and ethnic groups as this result from low socioeconomic status, gender, age and geographic location. Of all ethnics groups in the United States Non-Hispanic Blacks, Hispanics, American Indians as well as Alaska Natives generally have the poorest oral health (Centers for Disease Control and Prevention, 2013a; National Center for Farmworker Health, 2013). About 1 in 4 adults in the U.S. have untreated tooth decay and nearly 47% have a form of periodontal disease (Centers for Disease Control and Prevention, 2012). Major risk factors for poor oral health in the U.S. include unhealthy diet, tobacco use, frequent alcohol use, poor access to dental services as well as lack of dental insurance (Centers for Disease Control and Prevention, 2013b; National Center for Farmworker Health, 2013).

Utilization of Dental Services

In contrast to other health services such as medical care, the use of dental services is much lower for people with low income and limited resources (Andersen & Newman, 2005). In 2010, 69.9% of adults in the U.S. had a dental visit in the past year. One reason for this disparity is that for every adult without health insurance, an estimated of three lack dental insurance (Florida Charts, 2011; Healthy People 2013, 2020; Kaiser Family Foundation, 2012).In 2010, 66.4% of adults age 18 and older have had a dental visit

within the past year in the state of Florida. Amongst these 63% have had their teeth cleaned. In addition, 48% had at least one permanent tooth removed because of tooth decay or gum disease (Centers for Disease Control and Prevention, 2012, Florida Charts, 2011).

Hispanics Oral Health in the United States

Hispanics have become the largest minority group in the United States, resulting in an increase in oral health demands (Ennis et al., 2011; Humes et al., 2011; Ramos-Gómez et al., 2005). Periodontal disease occurs 10 times more frequently in Hispanics than in Whites (Mejia et al., 2008; Ramos-Gómez et al., 2005). In addition, Mexican Americans aged 35 to 44 experience untreated tooth decay nearly twice as much as their White, non-Hispanic counterparts (Barker & Horton, 2008; Centers for Disease Control and Prevention, 2013a). Furthermore, in a study conducted by the National Institutes of Health (NIH) consisting of 16,415 Central Americans, Cubans, Dominicans, Mexicans, Puerto Ricans, and South Americans, researchers found that Central Americans have the highest percentage of unfilled dental cavities with 35.4%, followed by Mexicans with 33.7%. They also reported that Cubans present the highest number of missing teeth with 66.3% compared to Mexicans at 49.4% (Schneiderman, 2013).

Hispanics Utilization of Dental Services

The percent of Hispanics adults who had at least one dental visit in the past year was 49.9% compare with 66.8% of non-Hispanic White adults. Additionally, Mexican Americans have the lowest utilization rate and poorest oral health status of all Hispanic sub-groups (Castañeda et al., 2010b; Scott & Smile, 2005).

Some of the barriers for not seeking needed dental care include cost of oral health, fear of the dentist, long waiting time, transportation difficulties, language barriers and lack of available facilities (Castañeda et al., 2010a; Entwistle & Swanson, 1989; Fallon et al., 2011; Lukes & Miller, 2002; Mueller, Schur, & Paramore, 1998; Scott & Smile, 2005; Vázquez & Swan, 2003). Some studies also have found that low acculturation and non-English proficiency were associated with low dental service utilization (Graham, Tomar, & Logan, 2005; Quandt et al., 2007; Ramos-Gómez et al., 2005; Riley et al., 2008; Scott & Smile, 2005).

Migrant Farmworkers Oral Health in the United States

Oral Health Problems

Migrant farmworkers in the United States of all ages have a level of oral health far worse than what is found in the general population, and present a higher prevalence of oral health problems such as caries and gum disease (Finlayson et al., 2010; Lukes & Miller, 2002; National Center for Farmworker Health, 2009b, 2013; Quandt et al., 2007; U.S. Department of Health and Human Services, 2000). Oral health has been ranked as one of the major health problems facing migrant farmworkers (Entwistle & Swanson, 1989; Frank et al., 2013; Gavaldon et al., 2010; Lukes & Simon, 2005; Quandt et al., 2007).

Despite the importance of their contribution to the U.S. economy, researches such as Anthony et al. (2008), Avery (1976), Entwistle & Swanson (1989), and Swanson (1985) have indicated in their studies that the life of adult Hispanic farmworkers is characterized

by poverty, inadequate housing, nutritional deficiencies, pesticide exposure and oral health deficiencies. Researchers such as Lombardi (2002), and Hansen & Donohoe (2003) observed that the lack of awareness and access to dental care are key factors in the level of dental disease among this population. All of these problems, in conjunction with poor oral hygiene habits put them at a higher risk for dental diseases (Avery, 1976; National Center for Farmworkers Health, 2009; Villarejo, 2003).

Migrant farmworkers use traditional remedies instead of prescription medicines when treating oral health problems. Examples of these are; placing salt, hydrogen peroxide and aspirin powder over the affected tooth. As a result, these homemade treatments delay their visits to the dentist and in many cases result in complications (Anthony et al., 2010; Arcury & Quandt, 2007; Connor, 2010; Entwistle & Swanson, 1989; Feldman et al., 2009, Poss et al., 2005).

Clinical studies as well as self-reported data on migrant farmworkers have found that the majority of the Hispanic farmworkers presented similar patterns of untreated caries, periodontal disease and missing or broken teeth. For example, Entwistle & Swanson (1989) found in their Colorado study, that of 231 adult Hispanic migrant farmworkers, 85% presented one or more decayed teeth and 66% had one or fewer filled teeth. In a study conducted in California with 971 farmworkers, Villarejo et al. (2000) established that 30% had decay, missing or broken teeth and 10% had gingivitis. In addition, two studies conducted in Illinois by Lukes & Miller (2002), and Lukes & Simon (2005) found that migrant farmworkers experienced bleeding gums (50%) and tooth loss (49%). In addition, 69% of adult farmworkers had one decayed tooth and more that 50%

had three or more decayed teeth. Likewise, Quandt et al. (2007) in their study of 151 Hispanic farmworkers in North Carolina identified caries as the most current functional oral health problem in this population with 52% affected, followed by 40% with gums disease, and 33% missing teeth. Additionally, Quandt et al. (2007) found in a second study of 220 adult Hispanic farmworkers in North Carolina and Virginia that 21% had bleeding gums and 25% had lost a permanent tooth. Also, Villarejo et al. (2010) reported a prevalence of dental caries at 36%, missing or broken teeth at 30%, and 18% gingivitis. Another study in California by Finlayson et al. (2010) found that 86% of surveyed agricultural farmworkers perceived having current oral health needs. Likewise, in Michigan of 120 adult migrant farmworkers, 19% had dental abscesses, 71% had untreated caries, and 43.8% had lost teeth because of caries (Gavaldon et al., 2010).

Utilization of Dental Services

Hispanic migrant farmworkers suffer from poor oral health as a consequence of lack of access to dental care (Castañeda et al., 2010a; Entwistle & Swanson, 1989; Hoerster et al., 2011; Lukes & Miller, 2002; National Center for Farmworker Health, 2012b; Villarejo et al., 2000). Studies have found that migrant farmworkers seek care only when an oral health emergency develops or when dental pain interferes with their regular habits such as eating, swallowing or talking. Migrant farmworkers usually do not visit dental facilities for preventive measures or for regular routine visits because they have to take time off from work and every hour away from the field means one less hour of pay (Arcury & Quandt, 2007; Centers for Disease Control and Prevention, 2013a; Connor et al., 2007; Doyle, Rager, Bates, & Cooper, 2006; Entwistle & Swanson, 1989; Finlayson

et al., 2010; Hansen & Donohoe, 2003; Healthy People 2020; Lombardi, 2002; Lukes & Miller, 2002; Lukes & Simon, 2005, 2006; National Center for Farm Workers Health 2009b, 2013; Perilla et al.,1998; Poss & Pierce, 2003; Quandt et al., 2007; Seirawan, 2008; Slesinger, 1992).

Approximately sixty federally funded migrant clinics operate in Florida; however, only a few provide dental services. Scarcity of resources, limited clinic hours, range of available services, number of oral health providers and bilingual personnel, contribute to the lower dental care utilization of this population (Betchel et al., 1995; Holmes, 2012; Lukes & Miller, 2002; Lukes & Simon 2005; National Center for Farm Workers Health 2009b, 2013; Perilla et al., 1998; Villarejo, 2003). Nevertheless, when clinics were able to provide comprehensive dental services, a positive health outcome regarding improvement in the overall oral health of farmworkers has been documented (Lombardi, 2002; Holmes, 2012; Koday et al., 1990).

In addition, lack of transportation, cost, no sick leave, fear of job loss, communication problems (language), low literacy, lack of dental insurance and cultural problems are contributing factors leading to lack of dental care (Anthony al et .,2008; Arcury & Quandt, 2007; De Jesus Diaz Perez et al.,2004; Fallon et al., 2012; Feldman et al., 2009; Frank et al.,2013; Gavaldon et al., 2010; Hansen & Donohoe, 2003; Hoerster et al., 2010; Hoerster et al., 2011; National Center for Farmworker Health, 2012a; New York State Department of Health, 2007; Petersen, 2003; Price et., 2013; Rosenbaum & Shin, 2005; Scott & Simile, 2005; U.S. Department of Health and Human Services, 2000; Villarejo, 2003).

Studies have continuously reported similar patterns of dental care utilization from migrant farmworkers across the U.S., with most receiving no dental care. For example, Avery (1976) found little use of dental services, except for tooth extractions in Florida. Entwistle & Swanson (1989) reported that 22% of migrant farmworkers in Colorado have never received dental care and 79% have not received regular dental care. Data from the California Agricultural Workers Health Survey indicated that 49.5% of male farmworkers and 44.4% of female farmworkers have never received dental care (Villarejo et al., 2000). Similarly, Lukes & Miller (2002) reported that among 119 migrant farmworkers living in Illinois, 51% had not sought dental care during the previous year. Poss & Pierce (2003) surveyed 150 migrants' farmworkers in West Texas and Southern New Mexico and found that 45% had never received regular dental care. Likewise, Lukes & Simon (2006) observed that from 81 farmworkers assessed, 44% sought care for acute problems such as pain, infection, and trauma, followed by 32% for restoration services, and 26% for preventive services. Finally, Quandt and colleagues in their 2007 study of 220 adult Hispanic farmworkers in North Carolina and Virginia found that only 20% reported dental services within the last year.

Theoretical model

Andersen's Behavioral Model

Andersen's Behavioral Model, was first proposed in 1968 to explain access to health services in the U.S. (Andersen, 1968). It focuses on the individual as the unit of analysis and measures the joint effect of factors in the perspective domain of the model. It also suggests that people's use of health services is a function of factors such as predisposing,

enabling and need (Andersen & Newman, 2005; Babitsch et al., 2012). Moreover, the entire model can explain the process of health care utilization as well as each component: predisposing, enabling and need factors making an independent contribution to predict use (Andersen, 1995; Andersen et al., 2000; Bustamante et al., 2012; Gelberg et al., 2000; Hoerster et al., 2010).

Predisposing factors refer to characteristics that exist prior to illness such as age, gender, marital status, family size, education, religion, ethnicity, occupation, attitudes, values and knowledge that people have concerning and towards the health care system. People with these characteristics are more likely to use health services even though these characteristics are not directly responsible for health service use. For example, people in different age groups have different types and amounts of illnesses and consequently different patterns of medical care use (Andersen, 1995; Andersen & Newman, 2005; Babitsch et al., 2012; Bustamante et al., 2012; Gelberg et al., 2000; Hoerster et al., 2010; Kim et al., 2010; Lo & Fulda, 2008). Enabling factors are conditions that make health service resources available to the individual. They refer to income, health insurance, regular source of care, travel and the extent and quality of social relationships (Andersen, 1995; Andersen & Newman, 2005; Babitsch et al., 2012; Bustamante et al., 2012; Gelberg et al., 2000; Hoerster et al., 2010; Kim et al., 2010; Lo & Fulda, 2008). Need factors refer to how people view their own health and functional status as well as how they experience symptoms of illness, pain, concerns about their health and whether or not they judge their problems to be of sufficient importance and magnitude to seek professional help. They are regarded as the most immediate cause of health service use

(Andersen, 1995; Andersen & Newman, 2005; Babitsch et al., 2012; Bustamante et al., 2012; Gelberg et al., 2000; Hoerster et al., 2010; Kim et al., 2010; Lo & Fulda, 2008).

Past studies have applied this model to examine patterns of dental utilization in several adult samples (Atchison, Der-Martirosian, & Gift, 1998; Finlayson et al., 2010; Gilbert et al., 1998; Pereyra et al., 2011). The literature suggests that despite differences in study populations, decisions to seek dental care depends each of Andersen's model domains. For instance, when predisposing and enabling domains favor dental care utilization, the decision to seek dental care, will only occur when the individual perceives a need for treatment (Atchison et al., 1993; Baker, 2009; Evashwick, Conrad, & Lee, 1982; Gilbert et al., 1998).

Summary

The above literature review brings attention to the current poor health of adult migrant farmworkers and points to their unique conditions and historically underserved status. As also noted this population exhibits many dental problems, unmet needs and barriers. Therefore, this mixed-methods study explores patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation, while also examining the social and cultural construction of oral health. The next chapter illustrates the methods used in both phases of the study (quantitative and qualitative) and their fit into the conceptual model proposed here.

CHAPTER III

METHODS

Research Design

This mixed-methods study explored patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation of visiting the dentist at least once a year, while also examining the social and cultural construction of oral health (American Dental Association, 2014; American Dental Hygienists Association, 2007; Doty, & Weech-Maldonado, 2003; Kuthy, Odom, Salsberry, Nickel, & Polivka, 1998). In order to investigate the questions of interest, a sequential mixed-methods explanatory design was employed. This entailed collecting and analyzing first quantitative and then qualitative data in sequential phases (Creswell et al., 2003; Tashakkori & Teddlie, 1998).

Phase I Quantitative

Data for the quantitative phase of this study came from the parent study "HIV Risk Reduction in Hispanic Migrant Workers in South Florida" which took place between June 2008 and June 2011. Its aim was to assess HIV-related health behaviors. The oral health component, the main focus of the present study, was added at the nine-month follow-up of the parent study. For purposes of this dissertation, the last data collection period of the parent study becomes the basis for the quantitative phase of the current study. Data collection took place from September to December 2010. Its aim was to

explore patterns of dental health care utilization with special emphasis on those who did not comply with the ADA and the ADHA recommendation.

Phase II Qualitative

Data for the qualitative phase of the present study relied on a supplement to the parent study. Fourteen participants, willing and available to participate in the ethnographic interviews, were recruited with purpose to further explore patterns of dental health care utilization as well as the social and cultural construction of oral health.

Participants Recruitment from the Parent Study

Recruitment for the sample took place in the Homestead-Florida City area from a total of 18,332 migrant farmworkers in Miami -Dade County, from which 16,000 were of Hispanic origin. Population estimates were established on the basis of the number of nurseries, their source of employment in the area. The smallest nurseries employ between 5 to 10 farmworkers; while the large ones employ 1,000 farmworkers (Larson, 2000). It was estimated that at least there were 6,000 farmworkers in the area from which approximately from 4,800 farmworkers were Hispanics. In collaboration with the Farmworker Association of Florida, their office site became the location for recruiting the sample. For active recruitment, potential participants were approached in a variety of non-institutional settings by recruitment staff from the project. Potential participants were given information about the nature of the study only in general terms without revealing any specifics of the requirements to participate or the time involved. Individuals who were willing to be screened were asked questions regarding eligibility criteria (see below)

in order to determine if they qualified for the study. In addition to recruiting participants actively, the study also used a passive recruitment strategy by screening potential participants referred to the study by participants already enrolled into the study and friends who heard about the study but were ineligible.

Inclusion and Exclusion Criteria form the Parent Study

Individuals eligible for the parent study were a) of Hispanic origin; b) 18 years of age or older; c) fluent in spoken English or Spanish; d) willing to be contacted for follow-up assessments; e) likely to live in the general geographic area for 6 months; f) able to understand and provide written informed consent; g) self-reported at least one episode of unprotected vaginal/anal/oral sex in the past 3 months (prior to entry into the study), and consumption of alcohol or drug use in the past 3 months; h) able to participate in intervention sessions; and i) had a "farm card" – given to all laborers by farm/nursery owners.

Sample Size of the Study

Phase I Quantitative

The parent study sample consisted of 290 participants from the Homestead/Florida City area in Miami-Dade County. At the time of the nine-month follow-up, the study retained 278 participants from whom oral health assessments were obtained.

Power analysis

The parent study used a conservative .187 effect size, an alpha level of .05 and a possible 12.5% attrition from intake to termination to determine power and sample size needed for the study. Given these estimates, the minimum required sample size was 60 at

intake and 44 at termination in order to achieve a power of .80. The parent study recruited 290 participants, at baseline and of these 278 were retained at the nine-month follow- up. Thus the sample size for the quantitative phase of the current study (n =278) sufficiently met power requirements.

Phase II Qualitative

In addition to the nine-month follow-up sample, which became the basis for the quantitative phase of the current study, the qualitative phase relied on a supplement to the parent study to recruit participants to this phase. The supplement recruited 83 participants from the nine-month follow up of the parent study to train community members in research. It was from this subsample of 83, that fourteen participants, willing and available to participate in the ethnographic interviews, were recruited for the qualitative phase of the current study. Although at the time, it was considered important to set criteria for recruitment to the qualitative sample (i.e., gender, nationality, age, time since last dental visit), when faced with several contextual challenges, recruitment became strictly on a voluntary basis and very much depended on the availability of participants during certain days and time when the interviewer was available. Pragmatic considerations, and no other study consideration, drove those who stayed away and brought in those who volunteered to participate. Despite the above considerations, the final sample of fourteen farmworkers was split exactly in half along the dependent variable of the quantitative analysis (time since last dental visit). That is, seven were compliant with the ADA and ADHA recommendation of visiting at least once a year and seven were not.

Data Collection

Phase I Quantitative

Surveys were conducted at one of the offices of the Farmworker Association of Florida. Each adult independently completed an Audio Computer-Assisted Self-Interview (ACASI) questionnaire in Spanish under the supervision of project staff. The ACASI questionnaire downloaded to the computer displayed the text of each question and its responses, while concurrently a prerecorded interviewer's voice, read questions and answers to the respondent. Participants listened privately through headphones and answered using the computer keyboard. Project staff members were available during interviews in case their help was required. At the end of each data collection session, self-reported answers were automatically saved in the computer. This program have been reported to work well even when respondents have limited computer and reading skills and is preferred when respondents need to report current behaviors or activities (i.e., drug use, victimization) that they might not report to an interviewer (O'Reilly, Hubbard, & Lessler,1994).

Questions for the quantitative arm of this study, such as age, gender, education, relationship status, country of origin, religious beliefs, employment status, health insurance, health seeking behavior, social support, acculturation and illness diagnosis were drawn from the parent study questionnaire HIV risk behaviors. The oral health component, the main focus of the present study, was added at the nine-month follow-up of the parent study. Based on an extensive review of the literature, 22 questions were purposely selected from validated measures and scales used in national data sets such as

the National Institute of Dental and Craniofacial Research (NIDCR) data resource center survey, National Health and Nutrition Examination Survey (NHANES), Behavioral Risk Factor Surveillance System (BRFSS) (Dental, Oral and Craniofacial Data Resource Center, (2010), and the Spanish Oral Health Impact Profile questionnaire (OHIP-14) (Slade, 1997). The reliability of the (OHIP-14) instrument was based on Cronbach's alpha, 0.70-0.83 and interclass correlation coefficient, 0.42-0.77 (Locker, Jokovic, & Clarke, 2004). The 22 questions selected for inclusion and validated in several earlier large and well known studies were translated and back translated by the researcher and further revised for content by one committee member and two members of the Farmworker Association of Florida. After consensus, the translated items in Spanish were pilot tested with 10 participants to establish their appropriateness to the target population, mainly examining the clarity of the questions, with emphasis on participants understanding. Accordingly, revisions were made based on results from the pilot test. The 22 questions included, were grouped in seven sections: (1) time since last dental visit; (2) dental insurance; (3) dental problems; (4) preventive care; (5) assessment of general oral health status; (6) self-perceived need for dental care; and (7) oral health-related quality of life (OHIP-14). Informed by the work conducted by Pereyra and others (2011), two binary summary measures from the (OHIP-14) items were created for purposes of analysis: 1) on a regular basis and 2) most of the time. Though questions on income and dental insurance were asked, responses to these items were not incorporated in the final analysis, since they did not present variability. Additionally, questions selected for investigation did not include major risk factors for poor oral health, e.g., unhealthy diet,

tobacco use, and frequent alcohol use (Centers for Disease Control and Prevention, 2013b; National Center for Farmworker Health, 2013).

Note that the purpose of this mixed-methods study was to explore patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation, while also examining the social and cultural construction of oral health. For the quantitative phase of the study, the outcome variable (time since last dental visit) was defined by the time elapsed since the participant's last dental visit prior to study enrollment, obtained by the following question: “How long has it been since your last visit for dental care?” For purposes of analysis, this variable was categorized as having last visited the dentist within a year (compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year) and over a year (non-compliance with the ADA and the ADHA recommendation). The analysis was based on non-compliers measured as (over a year). Dependent and independent variables as well as questionnaire items are shown in Table 2.

Table 2. Dependent and independent variables

Concept	**Variables**	**Indicators**	**Measures**
Predisposing factors (Independent)	Age (years)	What is your age?	2 = 18-29 3 = 30-39 4 = 40-49 5 = 50 and older
	Gender	Gender of respondent	0 = Male 1 = Female
	Education	What is the highest level of schooling you have completed?	1 = No formal education 2 = Less than high school 3 = High school or higher
	Relationship status	What it is your relationship status?	1 = No relationship 2 = Relationship 3 = Relationship but away

Predisposing factors (cont.) (Independent)	Country of origin	If Hispanic, what is your country of origin?	1 = Mexico 2 = Guatemala 3 = Honduras 4 = Other
	Religious beliefs	Do you consider yourself to be religious?	1 = Very religious 2 = Religious 3 = No very religious 4 = Not religious at all
	Knowledge of dental care	In your opinion, which one of these is the best method for preventing tooth decay?	1 = Limiting sugar/snacks 2 = Using fluoride water or dental products with fluoride 3 = Chewing sugarless gum 4 = Brushing and flossing teeth 5 = Visiting the dentist every 6 months 6 = Do not know
	Tooth brushing frequency	How many times a day do you usually brush your teeth?	0= Never 1 = Once a day 2 = Twice a day 3 = Three times a day
	Use of dental floss	Do you use dental floss?	0=No 1=Yes
Enabling Factors (Independent)	Employment status	Which one of the following best describes your work situation in the past 30 days?	1 = Full time 2 = Part time 3 = Seasonal 4 = Without employment
	Health insurance	Do you have medical insurance?	0=No 1=Yes
	Health care seeking behavior	When you are sick, where is the main place you go for medical care?	1= Community clinic 2 = Private doctor 3 =Other
	Social support	Do you have close relationships that provide you with a sense of emotional security and well-being?	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5= Strongly agree
	Acculturation (The bicultural questionnaire assesses use of English and Spanish as well as specific preferences for Hispanic and American activities independently from one another)	Bicultural Acculturation Scale –Aggregate score from all 20 items. (Cortes, Rogler, & Malgady,1994)	1 = Very strong 2 = Strong 3 = Moderate 4 = Week

Need factors (Independent)	Self-perceived need for dental treatment	Do you feel you are currently in need of dental treatment?	0=No 1=Yes
	Oral Health Impact Profile (Evaluate the influence of oral health on quality of life)	Oral Health Impact Profile-OHIP14 item questionnaire (Slade, 1997)	0=No 1=Yes
	Oral health problems	Are you currently presenting oral health problems?	0=No 1=Yes
	Illness diagnosis	Have you ever been diagnosed with any illnesses?	0=No 1=Yes
	Self-perceived oral health condition of the mouth	How would you describe the condition of your mouth and teeth?	1 = Very good 2 = Good 3 = Regular 4 = Poor
Dental care utilization (Dependent)	Time since last dental visit	How long has it been since your last visit for dental care?	**0= Within a year (compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year).** **1= Over a year (non-compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year).**

Phase II Qualitative

As noted previously, the second phase of the study employed qualitative analysis in order to expand and increase understanding of findings yielded by the quantitative survey data. The qualitative phase relied on a supplement to the parent study to recruit participants to this phase. The supplement recruited 83 participants from the nine-month follow up of the parent study. It was from this subsample of 83, that fourteen participants were recruited. The final sample size for the qualitative phase was determined based on

the work of Guest, Bunce, & Johnson (2006), and Onwuegbuzie & Collins (2007). They indicated that in non-probabilistic samples, saturation usually occurs within the first 12 interviews. The final sample of fourteen farmworkers was split exactly in half along the dependent variable of the quantitative analysis (time since last dental visit). That is, seven were compliant with the ADA and ADHA recommendation of visiting at least once a year and seven were not. Ethnographic interviews were conducted in a private room at the Farmworker Association of Florida and, on average, lasted one hour.

The oral health interview guideline consisted of a two-step process: 1) in the first step, the concepts of Andersen's model (1968) on dental health care utilization were employed to inform the oral health interview questions; 2) subsequently, consensus was reached between the investigator and two dissertation committee members on other relevant concepts based on a review of the literature on qualitative oral health among Hispanics (Carrion et al., 2011; Cristancho, Garces, Peters, & Mueller, 2008; Perilla, 1998). The resulting 16 open-ended questions (see Table 3) that constitute the oral health interview guideline were included to elicit and encourage detailed descriptions of the participants' patterns of dental heath utilization, along with the social and cultural construction of oral health.

Table 3. Oral health interview guideline

1. In your own words, what do you understand by the word "mouth"
2. What do you understand by the words "oral health"?
3. How important is taking care of your "mouth"?
4. Is your personal appearance important to you? Do you worry about your "mouth" image?
5. Have you received information regarding oral health?
6. Can you tell me what the most common "mouth" problems are?
7. Have you ever visited a dentist? What were the reasons for that visit?
8. What sort of transportation do you use to go to the dentist?

9. In which language would you feel more comfortable describing problems related to the health of your "mouth" and teeth?
10. What are the reasons why you have not visited the dentist?
11. Are you afraid of the dentist?
12. Can you please describe your current oral health care practices?
13. Have oral health problems affected your participation in other activities? (like work, social events, daily life).
14. Do you take medications when you have problems with your "mouth" and teeth?
15. Have you used any home remedies when you have "mouth" pain or tooth ache?
16. Do you think there is any relationship between problems in your "mouth" and conditions in other parts of your body?

Data Analysis

Phase I Quantitative

Descriptive statistics (e.g., percentage distributions, means, and standard deviation) were used for organizing and preparing the data for analysis. Binary logistic regression analysis was used to examine the relationship between each predictor variable and the outcome variable (time since last dental visit). Hierarchical logistic regression analysis was employed to test the predictability of the predictor variables within a group structure (predisposing, enabling, and need factors) and the outcome variable (time since last dental visit). For purposes of analysis, the outcome variable was categorized as having last visited the dentist within a year (compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year) and over a year (non-compliance with the ADA and the ADHA recommendation). The analysis was based on non-compliers measured as (over a year) (see Table 4).

Mathematically, and for the purpose of the data analysis, the overall research question follows the general model:

$$Y \text{ (Time since last dental visit)} = \beta 0 + \beta 1 \text{ Predisposing} + \beta 2 \text{ Enabling} + \beta 3 \text{ Need}$$

Table 4. Logistic regression analysis

Predictor Variables	Binary logistic regression equations	Hierarchical logistic regression equation	Description *
Predisposing (Age, gender, education, relationship status, country of origin, religious beliefs, knowledge of dental care, tooth brushing frequency, use of dental floss)	$y = \beta_0 + \beta_i\, Age$ ...	$y = \beta_0 + \beta_i * Predisposing$	i=1…9
Enabling (Employment status, health insurance, health care seeking behavior, social support, acculturation)	$y = \beta_0 + \beta_j\, Employment\ status$ ...	$y = \beta_0 + \beta_i * Predisposing + \beta_j * Enabling$	i=1…9; J=1…5
Need (Self-perceived need for dental treatment, oral health impact profile on a regular basis and most of the time, oral health problems, illness diagnosis, self-perceived oral health condition of the mouth)	$y = \beta_0 + \beta_k Self - perecived\ need\ for\ dental\ treatment...$	$y = \beta_0 + \beta_i * Predisposing + \beta_j * Enabling + \beta_k * Need$	i=1…9; J=1…5; k=1…6

Phase II Qualitative

Verbatim transcripts of the fourteen audio-taped interviews were transcribed in Spanish and translated into English. The transcripts and translations were verify for content by the investigators and two bilingual dissertation committee members. This verification included back translations of a minimum of 10% of all interview content, which was independently done by all three readers and later discussed among them. The resulting transcripts were coded using Atlas. ti software following a content analysis approach (Bernard, 2013). In analyzing the data, themes and trends were identified in

regards to patterns of dental health care utilization and the social and cultural construction of participants' oral health. The qualitative analysis first examined themes based on the interview questions (Ely et al., 1999), and then identified salient themes that cut across the entire interviews (Creswell, 1998).

Mixed Methods

The synergy resulting from the interplay of both data sources (quantitative and qualitative) became essential in exploring patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation of visiting the dentist at least once a year, while also examining the social and cultural construction of oral health (see Table 5).

Table 5. Mixed-methods sequential explanatory design

Phase	Procedure	Product
Quantitative data collection ↓	Survey 278 participants	Numeric data
Quantitative data analysis ↓	SPSS	Descriptive statistics Binary logistic regression analysis was used to examine the relationship between each predictor (predisposing, enabling, and need factors) and the dependent variable (time since last dental visit). Hierarchical logistic regression analysis: First: Predisposing factors (e.g., age, gender, education, relationship status, country of origin, religious beliefs, knowledge of dental care, tooth brushing frequency, use of dental floss) were entered in the model. Second: After controlling for predisposing factors, enabling factors (e.g., employment status, health insurance, health care seeking behavior,

		social support, and acculturation) were entered in the model. Third: After controlling for predisposing and enabling factors, the need set of factors (e.g., self-perceived need for dental treatment, oral health impact profile, oral health problems, illness diagnosis, self-perceived oral health condition of the mouth) were entered last in the model.
Connecting Quatitative and Qualitative phases ↓	Fourteen participants from the parent study's supplement	Interview protocol
Qualitative data collection ↓	Ethnographic interviews	Interview transcripts
Qualitative data analysis ↓	Analysis with Atlas ti.	Themes and Codes
Integration of Quantitative and Qualitative	Interpretation and explanation of quantitative and qualitative results.	Discussion

Human Subject Considerations

For purpose of the submitted IRB, the proposed study performed secondary data analysis from a National Institute on Minority Health and Health Disparities (NIMHD) funded study, "HIV Risk Reduction in Hispanic Migrant Workers in South Florida" (IRB approval # 082407-00) and its supplement, "Hispanic Migrant Worker HIV Prevention Program" (IRB approval #102010-01), conducted at FIU through the Center for Research on U.S. Latinos HIV/AIDS and Drug Abuse (CRUSADA). After submitting the study plan for this research to the Institutional Review Board (IRB) at Florida International

University, the study was deemed exempt. The IRB determined that de-identified data in use for secondary analysis did not require further review.

Summary

Several analytic approaches were incorporated into the proposed mixed-methods study to explore patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation, while also examining the social and cultural construction of oral health. Fist, descriptive statistics were performed for all variables to summarize data. Second, time since last dental visit and each of the predisposing, enabling, and need factors were included in a binary logistic regression analysis. Third, time since last dental visit was examined within a hierarchical logistic regression analysis. Four, ethnographic interviews were analyzed. Finally, by relying on both quantitative and qualitative methods, a synergistic approach was employed.

In the next chapter, results of all statistical analyses will be displayed and discussed in terms of statistical significance. In addition emergent themes and codes from fourteen adult Hispanic migrant farmworkers' ethnographic interviews are presented and explained. Further discussion and potential impact of results will be addressed in chapter V.

CHAPTER IV

RESULTS

This mixed-methods study explored patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation of visiting the dentist at least once a year, while also examining the social and cultural construction of oral health (American Dental Association, 2014; American Dental Hygienists Association, 2007; Doty, & Weech-Maldonado, 2003; Kuthy, Odom, Salsberry, Nickel, & Polivka, 1998). In order to answer the study's hypotheses and research questions, a sequential mixed-methods explanatory design previously described by Creswell and colleagues (2003) and Tashakkori & Teddlie (1998) was conducted.

This chapter is divided into sections addressing the research questions formulated for this mixed-methods study (see Table 6). First, demographic and dental health care utilization characteristics are described for 278 adult Hispanic migrant farmworkers. Second, relations between key variables derived from Andersen's model (quantitative analysis) are addressed based on research question 1. Finally, emergent themes and codes from fourteen adult Hispanic migrant workers' ethnographic interviews were explained based on research questions 2-6.

Table 6. Research questions and analysis method

RQ Number	Research Question (RQ)	Analysis Method
RQ 1	To what extent are predisposing (e.g., age, gender, relationship status) enabling (e.g., acculturation, health insurance) and need factors (e.g., self-perceived need for dental treatment, oral health impact profile on a regular basis and most of the time, oral health problems, illness diagnosis) associated with adult Hispanic migrant farmworkers' time since last dental visit? **Hypothesis 1.** All variables considered as part of Andersen's model under the three different domains, will be significantly associated with time since last dental visit. **Hypothesis 2.** Based on Andersen's Model, the following sets of predictors: (Model 1) predisposing factors, (Model 2) predisposing and enabling factors, and (Model 3) predisposing, enabling and need factors, will be significantly associated with time since last dental visit.	Binary logistic regression Hierarchical logistic regression
RQ 2	In particular, what is the social construction of "the mouth," as perceived by this sub-group of Hispanic population?	Semi-structured interview
RQ 3	What is the Hispanic migrant farmworker construction of oral health?	Semi-structured interview
RQ 4	What are the cultural patterns of dental health utilization?	Semi-structured interview
RQ 5	What is the shared social and cultural construction of oral health care among this group?	Semi-structured interview
RQ 6	Have oral health problems significantly impacted on the quality of life of farmworkers?	Semi-structured interview
RQ 7	How does a mixed-methods approach, as employed here, expand current knowledge and overall perspective of the oral health of this underserved population? Furthermore, how does this synergistic approach broaden our understanding of the various aspects underlying the oral health of this group?	Binary logistic regression Hierarchical logistic regression Semi-structured interview

Analysis

Phase I Quantitative Analysis

Data for the quantitative phase of this study came from the parent study "HIV Risk Reduction in Hispanic Migrant Workers in South Florida" which took place between June 2008 and June 2011. Prior to analysis, data were examined for accuracy of entry, missing values, and notable differences between respondents and non-respondents.

Descriptive Findings

The final sample size for the quantitative phase of the study consisted of 278 participants. The basic demographics from survey respondents are presented following the order of factors on the basis of Andersen's Behavioral Model (predisposing, enabling, and need factors) and the outcome variable (time since last dental visit). For purposes of analysis, this variable was categorized as having last visited the dentist within a year (compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year) and over a year (non-compliance with the ADA and the ADHA recommendation). The analysis was based on non-compliers measured as (over a year).

Predisposing Factors

Table 7 describes predisposing characteristics of the 278 participants in the sample. The mean age was 36.6 (ranging from 18 to 65, SD= 4.41years). Males constituted more than half (n=151) of the sample. In addition, more than two-thirds of study participants reported less than a high school education (n=191). Nearly half (n=120) stated being in a relationship. Mexicans represent the largest nationality in the sample (43.2%). A little

less than half (47.8%) of the sample consider themselves to be religious. Moreover, three quarters of the participants (n=202) described as part of their knowledge of dental care, brushing and flossing their teeth. However, only two thirds of the sample (n=186) responded that they brushed their teeth twice a day while 31.7% (n=88) reported using dental floss.

Table 7. Characteristics based on predisposing factors

Predisposing Variables	**Percent (%)**	**Frequency (n)**	**Within a year (compliance with the ADA and the ADHA recommendation) % (n)**	**Over a year (non-compliance with the ADA and the ADHA recommendation) % (n)**
Age (years)(mean = 36.6; s.d.=4.41)				
18-29	23	64	18.8 (12)	81.3 (52)
30-39	25.5	71	16.9 (12)	83.1 (59)
40-49	23.4	65	23.1 (15)	76.9 (50)
50 and older	28.1	78	23.1 (18)	76.9 (60)
Gender				
Male	54.3	151	20.5 (31)	79.5 (120)
Female	45.7	127	20.5 (26)	79.5 (101)
Education				
No formal education	27.7	77	18.2 (14)	81.8 (63)
Less than high school	68.7	191	22.0 (42)	78.0 (149)
High school or higher	3.6	10	10.0 (1)	90.0 (9)
Relationship status				
No relationship	36.3	101	22.8 (23)	77.2 (78)
Relationship	43.2	120	18.3 (22)	81.7 (98)
Relationship but away	20.5	57	21.1 (12)	78.9 (45)
Country of origin				
Mexico	43.2	120	22.5 (27)	77.5 (93)
Guatemala	20.1	56	17.9 (10)	82.1 (46)
Honduras	10.1	28	10.7 (3)	89.3 (25)
Other	26.6	74	23.0 (17)	77.0 (57)
Religious beliefs				

Very religious	7.2	20	25.0 (5)	75.0 (15)
Religious	47.8	133	21.1 (28)	78.9 (105)
No very religious	39.2	109	17.4 (19)	82.6 (90)
Not religious at all	5.8	16	31.3 (5)	68.8 (11)
Knowledge of dental care				
Limiting sugar/snacks	7.2	20	0 (0)	100 (20)
Using fluoride water and dental products with fluoride	13.3	37	27.0 (10)	73.0 (27)
Chewing sugarless gum	1.4	4	25.0 (1)	75.0 (3)
Brushing and flossing the teeth	72.7	202	21.8 (44)	78.2 (158)
Visiting the dentist every 6 months	2.5	7	28.6 (2)	71.4 (5)
Do not know	2.9	8	0 (0)	100 (8)
Tooth brushing frequency				
Never	4.7	13	0 (0)	100 (13)
Once a day	11.5	32	43.8 (14)	56.3 (18)
Twice a day	66.9	186	23.1 (43)	76.9 (143)
3 times a day	16.9	47	0 (0)	100 (47)
Use of dental floss				
No	68.3	190	20 (38)	80 (152)
Yes	31.7	88	21.6 (19)	78.4 (69)

Enabling Factors

Table 8 describes enabling characteristics of the sample. More than half of the study participants (n=152) had worked full time in agriculture in the past 30 days. A large majority of the participants (88.1%) did not have health insurance. Two thirds of the sample (n=188) had a regular source of care such as a community clinic. Regarding social support, more than a third (n= 99) perceived they did not have assistance from

other people in this country. More than a third of adult Hispanic migrant farmworkers (n=99) reported to be very highly oriented to Hispanic culture.

Table 8. Characteristics based on enabling factors

Enabling Variables	Percent (%)	Frequency (n)	Within a year (compliance with the ADA and the ADHA recommendation) % (n)	Over a year (non-compliance with the ADA and the ADHA recommendation) % (n)
Employment status				
Full time	54.7	152	23.0 (35)	77.0 (117)
Part time	13.7	38	0 (0)	100 (38)
Seasonal	7.9	22	45.5 (10)	54.5 (12)
Without employment	23.7	66	18.2 (12)	81.8 (54)
Health insurance				
No	88.1	245	21.2 (52)	78.8 (193)
Yes	11.9	33	15.2 (5)	84.8)(28)
Health care seeking behavior				
Community clinic	67.7	188	19.1 (36)	80.9 (152)
Private doctor	22.7	63	22.2 (14)	77.8 (49)
Other	9.7	27	25.9 (7)	74.1 (20)
Social support				
Strongly disagree	35.6	99	20.2 (20)	79.8 (79)
Disagree	28.8	80	28.8 (23)	71.3 (57)
Neutral	14.4	40	12.5 (5)	87.5 (35)
Agree	12.2	34	14.7 (5)	85.3 (29)
Strongly agree	9.0	25	16.0 (4)	84.0 (21)
Acculturation				
Very strong	34.2	95	18.9 (18)	81.1 (77)
Strong	35.6	99	21.2 (21)	78.8 (78)
Moderate	11.2	31	29.0 (9)	71.0 (22)
Week	19.1	53	17.0 (9)	83.0 (44)

Need Factors

Table 9 describes need characteristics of study participants. Over one-third of the sample (39.6%) was in need of dental treatment at the time of the survey. In terms of oral health quality of life, almost one-third (28.8%) of respondents reported at least one oral

health impact on a regular basis while about one-fifth (21.2%) of respondents reported at least one oral health impact most of the time. Less than half of respondents (41.4%) reported oral health problems. Regarding their health, two thirds (n=183) of respondents had been diagnosed with at least one illness. Slightly more than one-third of the sample (n=65) self-described the condition of their mouth as poor.

Table 9. Characteristics based on need factors

Need Factors	**Percent (%)**	**Frequency (n)**	**Within a year (compliance with the ADA and the ADHA recommendation) % (n)**	**Over a year (compliance with the ADA and the ADHA recommendation) % (n)**
Self-perceived need for dental treatment				
No	47.5	132	22.0 (29)	78.0 (103)
Yes	39.6	110	13.6 (15)	86.4 (95)
Do not know	12.9	36	36.1 (13)	63.9 (23)
Oral health impact on a regular basis				
No	71.2	198	28.3 (56)	71.7 (142)
Yes	28.8	80	1.3 (1)	98.8 (79)
Oral health impact most of the time				
No	78.8	219	25.6 (56)	74.4 (163)
Yes	21.2	59	1.7 (1)	98.3 (58)
Oral health problems				
No	58.6	163	22.1 (36)	77.9 (127)
Yes	41.4	115	18.3 (21)	81.7 (94)
Illness diagnosis				
No	34.2	95	16.8 (16)	83.2 (79)
Yes	65.8	183	22.4 (41)	77.6 (142)
Self-perceived oral health condition of the mouth				
Very good	7.9	22	100 (22)	0 (0)
Good	30.9	86	11.6 (10)	88.4 (76)
Regular	37.8	105	21.9 (23)	78.1 (82)
Poor	23.4	65	3.1 (2)	96.9 (63)

Outcome Variable

The purpose of this study was to explore patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation. The outcome variable (time since last dental visit) was defined by the time elapsed since the participant's last dental visit prior to study enrollment, obtained by the following question: "How long has it been since your last visit for dental care?" For purposes of analysis, this variable was categorized as having last visited the dentist within a year (compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year) and over a year (non-compliance with the ADA and the ADHA recommendation). The analysis was based on non-compliers measured as (over a year). As shown in Table 10, the majority of farmworkers (n=221) were non-compliant with the ADA and the ADHA recommendation, compared with one fifth of the sample (n=57) who were compliant with the ADA and the ADHA recommendation.

Table 10. Characteristics based on time since last dental visit

Outcome: ***Time since last dental visit***	**%(n)**
Within a year (Compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year).	20.5 (57)
Over a year (Non-compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year).	79.5 (221)

Characteristics of non-compliant

Table 7, 8, and 9 describe characteristics of non-compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year. The majority (n=120) were males, 77.5% (n=93) reported Mexico as their country of origin, 76.9 % (n=143) brushed their teeth twice a day, 78.4% (n=69) used dental floss, 78.8 (n=193) reported no having health insurance, 86.4% (n=95) self-perceived need for dental treatment, and 96.9% (n=63) self-perceived the condition of their mouth as poor.

Quantitative Research Question

(Question 1).*To what extent are predisposing (e.g., age, sex, marital status); enabling (e.g., acculturation, health insurance), and need factors (e.g., self-perceived need for dental treatment, oral health impact profile on a regular basis and most of the time, oral health problems, illness diagnosis) associated with Hispanic migrant farmworkers' time since last dental visit?*

Findings from the research question 1 and hypotheses 1 and 2 are presented below. A significance level of .05 was set for all statistical analyses.

Hypothesis 1. All variables considered as part of Andersen's model under the three different domains, will be significantly associated with time since last dental visit. For testing this hypothesis a binary logistic regression analysis was used.

Binary logistic regression was performed in order to estimate the association between the predisposing, enabling and need factors with the outcome variable (time since last dental visit) categorized as having last visited the dentist within a year

(compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year) and over a year (non-compliance with the ADA and the ADHA recommendation). The analysis was based on non-compliers measured as (over a year) (see table 11).

Table 11. Binary logistic regression

Predictor Variables	Binary logistic regression equations	Description *
Predisposing (Age, gender, education, relationship status, country of origin, religious beliefs, knowledge of dental care, tooth brushing frequency, use of dental floss)	$\boldsymbol{y = \beta_0 + \beta_i\, age}$ ...	i=1…9
Enabling (Employment status, health insurance, health care seeking behavior, social support, acculturation)	$\boldsymbol{y = \beta_0 + \beta_j Employment\ status...}$	J=1…5
Need (Self-perceived need for dental treatment, oral health impact profile on a regular basis and most of the time, oral health problems, illness diagnosis, self-perceived oral health condition of the mouth)	$\boldsymbol{y = \beta_0 + \beta_k\, Self - perceived\ need\ for\ dental\ teratment...}$	k=1…6

Predisposing Factors

As indicated in Table 12, among predisposing variables, tooth brushing frequency was statistically significant and positively associated with time since last dental visit (over a year) (odds ratio, or = 1.68, confidence interval, or 95% CI = 1.12 -2.53, P <.012). In other words, farmworkers who brushed their teeth more often were non-compliant with the ADA and the ADHA recommendation. However, other predisposing variables such as age, education, relationships status, country of origin, religious beliefs,

knowledge of dental care, and use of dental floss were not found to be statistically significant with time since last dental visit (over a year).

Table 12. Binary logistic regression- time since last dental visit and predisposing factors

Predisposing Variables	B	Sig.	Exp(B)	95% C.I.for EXP(B)	
				Lower	Upper
Age	-.11	.37	.88	.68	1.15
Gender	.00	.99	1.00	.55	1.80
Education	-.06	.82	.93	.52	1.67
Relationship status	.08	.69	1.08	.72	1.61
Country of origin	.02	.86	1.02	.80	1.29
Religious beliefs	.03	.86	1.03	.68	1.56
Knowledge of dental care	-.09	.52	.91	.69	1.20
Tooth brushing frequency	***.52***	***.012***	***1.68***	***1.12***	***2.53***
Use of dental floss	-.09	.76	.90	.48	1.68

Enabling Factors

As shown in Table 13, none of the five enabling variables (employment status, health insurance, health care seeking behavior, social support, and acculturation) were statistically significant with time since last dental visit (over a year).

Table 13. Binary logistic regression- time since last dental visit and enabling factors

Enabling Variables	B	Sig.	Exp(B)	95% C.I.for EXP(B)	
				Lower	Upper
Employment status	.02	.86	1.02	.80	1.28
Health insurance	.41	.42	1.50	.55	4.10
Health seeking behavior	-.04	.36	.95	.86	1.05
Social support	.13	.24	1.14	.90	1.45
Acculturation	-.00	.95	.99	.76	1.29

Need Factors

As shown in Table 14, among the need variables, self-perceived need for dental treatment (OR = 0.90, 95% CI = 0.83 - 0.99, P < 0.031) was statistically significant and negatively associated with time since last dental visit (over a year). Moreover, oral health impact on a regular basis (OR = 31.15, 95% CI = 4.23 – 229.38, P < 0.001), and most of the time (OR =19.92, 95% CI = 2.69 - 141.23, P < 0.003), as well as self-perceived oral health condition of the mouth (OR = 3.32, 95% CI = 2.22 - 4.98, P < 0.0001) were statistically significant and positively associated with time since last dental visit (over a year). In other words, farmworkers who reported needing dental treatment were compliant with the ADA and the ADHA recommendation of visiting the dentist at least once a year. However, farmworkers who experienced oral health impact on a regular basis and most of the time, as well as those who reported poor self-perception of the condition of the mouth were non-compliant with the ADA and the ADHA recommendation. Finally, oral health problems and previous diagnosis of an illness were not found to be statistically significant with time since last dental visit (over a year).

Table 14. Binary logistic regression- time since last dental visit and need factors

Need Variables	B	Sig.	Exp(B)	95% C.I.for EXP(B)	
				Lower	Upper
Self -perceived need for dental treatment	***-0.9***	***.031***	***.90***	***.83***	***.99***
Oral health impact on a regular basis	***3.43***	***.001***	***31.15***	***4.23***	***229.38***
Oral health impact most of the time	***2.99***	***.003***	***19.92***	***2.69***	***147.23***
Oral health problems	.23	.43	1.26	.69	2.31

Illness diagnosis	-.35	.27	.70	.37	1.33
Self-perceived oral health condition of the mouth	***1.2***	***.0001***	***3.32***	***2.22***	***4.98***

Hypothesis 2. Based on Andersen's Model, the following sets of predictors: (Model 1) predisposing factors, (Model 2) predisposing and enabling factors, and (Model 3) predisposing, enabling and need factors, will be significantly associated with time since last dental visit. A hierarchical logistic regression analysis was used to test the second hypothesis (see Table15).

Mathematically, and for the purpose of the data analysis, the overall research question follows the general model:

Y (Time since last dental visit) = β0 +β1 Predisposing +β2 Enabling +β3 Need

Table 15. Hierarchical logistic regression model

Predictor Variables	Equation	Description *
Predisposing (age, gender, education, relationship status, country of origin, religious beliefs, knowledge of dental care, tooth brushing frequency, use of dental floss)	$y = \beta_0 + \beta_i * Predisposing$	i=1…9
Enabling (employment status, health insurance, health care seeking behavior, social support, acculturation)	$y = \beta_0 + \beta_i * Predisposing + \beta_j * Enabling$	i=1…9; J=1…5
Need (self-perceived need for dental treatment, oral health impact on a regular basis, and most of the time, oral health problems, illness diagnosis, self-perceived oral health condition of the mouth)	$y = \beta_0 + \beta_i * Predisposing + \beta_j * Enabling + \beta_k * Need$	i=1…9; J=1…5; k=1…6

Hierarchical logistic regression analysis was employed to test the predictability of the predictor variables within a group structure (predisposing, enabling, and need factors) and the outcome variable (time since last dental visit). For purposes of analysis, the outcome variable was categorized as having last visited the dentist within a year (compliance with the ADA and the ADHA recommendation of visiting the dentist at least once a year) and over a year (non-compliance with the ADA and the ADHA recommendation). The analysis was based on non-compliers measured as (over a year).

Based on the health care utilization literature, Andersen's Model suggests that predisposing, enabling and need factors have a linear order (Andersen, 1968). First, predisposing variables were entered in model 1, since they are typically immutable and make the individual more or less inclined to use dental services. Second, enabling variables were added to predisposing variables in model 2, as these provide an estimate of the person's means and/or support for utilizing dental services. Third, need variables were added to predisposing and enabling variables in model 3, as they have been found to be important predictors of dental health care utilization. Each variable in the hierarchical analysis was included not only as a means of assessing its individual impact on time since last dental visit (over a year), but also as a potential confounding variable whose inclusion in the analysis was vital to reduce the possible bias on other variables.

Predisposing Factors

As shown in Table 16, when predisposing variables were entered together in model 1, tooth brushing frequency was statistically significant and positively associated with time since last dental visit (over a year) (OR = 1.75, 95% CI = 1.14-2.69, $P < 0.009$).

Nevertheless, the rest of the variables were not found to be statistically significant with time since last dental visit (over a year).

Table 16. Model 1- Hierarchical logistic regression -predisposing variables

Predisposing		B	Sig.	Exp(B)	95% C.I.for EXP(B)	
					Lower	Upper
	Age	-.16	.23	.85	.65	1.11
	Gender	.06	.83	1.06	.57	1.98
	Education	-.07	.80	.92	.51	1.68
	Relationship status	.03	.89	1.03	.66	1.60
	Country of origin	-.00	.96	.99	.78	1.26
	Religious beliefs	.02	.91	1.02	.64	1.63
	Knowledge of dental care	-.10	.47	.90	.67	1.19
	Tooth brushing frequency	***.56***	***.009***	***1.75***	***1.14***	***2.69***
	Use of dental floss	-.26	.44	.77	.39	1.50

Predisposing and Enabling Factors

As shown in Table 17, after controlling for predisposing variables, the enabling set of variables were entered in model 2 . Only tooth brushing frequency from predisposing variables remained statistically significant as well as positively associated with time since last dental visit (over a year) (OR = 1.96, 95% CI = 1.24 - 3.09, P < 0.004). The remaining predisposing variables were not found to be statistically significant with time since last dental visit (over a year). In addition, none of the enabling variables were found to be statistically significant with time since last dental visit (over a year).

Table 17. Model 2- Hierarchical logistic regression -predisposing and enabling variables

Predisposing + Enabling		B	Sig.	Exp(B)	95% C.I.for EXP(B)	
					Lower	Upper
Predisposing	Age	-.14	.29	.86	.65	1.13
	Gender	.07	.81	1.07	.57	2.01
	Education	-.13	.66	.87	.47	1.59
	Relationship status	.00	.98	1.00	.64	1.57
	Country of origin	-.00	.98	.99	.77	1.27
	Religious beliefs	-.01	.95	.98	.61	1.58
	Knowledge of dental care	-.13	.37	.87	.64	1.17
	Tooth brushing frequency	***.67***	***.004***	***1.96***	***1.24***	***3.09***
Enabling	Use of dental floss	-.24	.47	.78	.39	1.54
	Employment status	-.10	.42	.90	.69	1.16
	Health insurance	.47	.37	1.60	.56	4.55
	Health care seeking behavior	-.01	.72	.98	.88	1.09
	Social support	.21	.09	1.23	.96	1.58
	Acculturation	.00	.97	1.00	.76	1.32

Predisposing, Enabling and Need Factors

As shown in Table 18, after controlling for predisposing and enabling sets of variables, need variables were entered in model 3. Use of dental floss (OR = 0.35, 95% CI = 1.15 - 0.81, P < 0.015) and self-perceived need for dental treatment (OR = 0.81, 95% CI = 0.71 - 0.91, P < 0.001) were statistically significant and negatively associated with time since last dental visit (over a year). Moreover, self-perceived oral health condition of the mouth (OR = 4.42, 95% CI = 2.43 - 8.04, P < 0.0001) was statistically significant and positively associated with time since last dental visit (over a year). In other words, farmworkers who used floss and reported needing dental treatment were compliant with the ADA and the ADHA recommendation. However, farmworkers with poor self-perception of their oral health condition of the mouth were non-compliant with the recommendation. The remaining predisposing and need variables, as well as none of

enabling variables were found to be statistically significant with time since last year dental visit (over a year).

Table 18. Model 3- Hierarchical logistic regression predisposing, enabling and need factors

Predisposing +Enabling + Need		B	Sig.	Exp(B)	95% C.I.for EXP(B)	
					Lower	Upper
Predisposing	Age	.12	.50	1.13	.78	1.64
	Gender	-.10	.78	.90	.42	1.90
	Education	-.01	.97	.98	.48	2.02
	Relationship status	-.09	.72	.90	.53	1.54
	Country of origin	-.13	.36	.87	.64	1.17
	Religious beliefs	-.16	.57	.84	.47	1.50
	Knowledge of dental care	-.20	.21	.81	.58	1.13
	Tooth brushing frequency	.57	.08	1.78	.92	3.43
Enabling	***Use of dental floss***	***-1.04***	***.015***	***.35***	***.15***	***.81***
	Employment status	.13	.47	1.15	.78	1.67
	Health Insurance	.59	.34	1.80	.53	6.09
	Health care seeking behavior	-.06	.31	.93	.81	1.06
	Social support	.22	.13	1.25	.93	1.67
	Acculturation	.05	.77	1.05	.74	1.47
	Self-perceived need of dental treatment	***-.21***	***.001***	***.81***	***.715***	***.91***
Need	Oral health impact on a regular basis	2.50	.07	12.18	.74	198.39
	Oral health impact most of the time	.59	.69	1.81	.09	34.86
	Oral health problems	-.65	.14	.52	.21	1.24
	Illness diagnosis	-.35	.41	.70	.29	1.65
	Self-perceived oral health condition of the mouth	***1.48***	***.0001***	***4.42***	***2.43***	***8.04***

Phase II Qualitative Analysis

As illustrated under methods, the qualitative phase relied on a supplement to the parent study to recruit participants to this phase. The supplement recruited 83 participants from the nine -month follow up of the parent study. It was from this subsample of 83, that fourteen participants were recruited.

As Polit and Beck (2004) observe, qualitative data analysis concludes at the point in which themes and categories from the data become repetitive and redundant. Participants' narratives from ethnographic interviews were examined in response to research questions 2-6. In addition, patterns of dental health care utilization as well as their social and cultural constructions of oral health were explored for emergent themes.

Demographic characteristics of participants are described below; followed by themes that emerged during the interviews with excerpts from participant narratives.

Demographic

As shown in Table 19, the qualitative sample was composed of ten women (71.4%) and 4 men (28.5%). Age ranged from 27 to 58 years. Eleven participants (78%) were born in Mexico, while the other three reported Ecuador, Salvador, and Venezuela as their country of origin. Half of participants have lived in the US ten years or more, and half have worked in agriculture for ten years or more.

Table 19. Characteristics qualitative sample

	%	n
Age (years)		
18 to 29	7	1
30 to 39	50	7
40 to 49	14.2	2
50 and older	28.5	4
Gender		
Male	28.5	4
Female	71.4	10
Country of origin		
Mexico	78.00	11
Other	22.00	3
Living in the US		

1 to 9	7.1	1
10 to 19	50	7
20+	42.8	6
Years working in agriculture		
1 to 9	21.4	3
10 to 19	50	7
20+	28.5	4

Descriptive Findings

Ethnographic interviews offered a rich portrait of the poor oral health status and underutilization of dental care services among Hispanic migrant farmworkers in South Florida. Data analysis followed standard techniques for thematic identification and coding. Themes and codes were developed based on the narratives provided by participants responses to the 16 questions included in the oral health interview guideline. The abstraction of the narrative's latent meaning was achieved by the implementation of two key analytical techniques: word repetition and key-words-in-context (Graneheim & Lundman, 2004). Discussions between the investigator and two dissertation committee members yielded agreement on how to sort themes and codes. Eight major themes emerged that shed light on patterns of dental care utilization and the social and cultural construction of oral health among adult Hispanic farmworkers in South Florida. These themes were revised by all three readers to finalize codes. Research questions and the resulting themes are outlined in Table 20.

Table 20. Qualitative findings

Questions	Themes	Codes
What is the social construction of "the mouth," as perceived by this sub-group of the Hispanic population? (Question 2)	• Understanding of the mouth	✓ Part/function ✓ Connection
What is the Hispanic migrant farmworker construction of oral health? (Question 3)	• Meaning of oral health	✓ Socialization ✓ Attitude toward oral health
What are the cultural patterns of dental health utilization? (Question 4)	• History of dental care • Dental problems • Barriers to dental care	✓ Lack of financial resources and health/dental insurance ✓ Language barriers ✓ Fear of the dentist ✓ Transportation problems
What is the shared social and cultural construction of oral health care among this group? (Question 5)	• Taking care of the mouth/teeth • Medications	✓ Home remedies ✓ Over the counter/prescriptions
What is the impact of oral health problems on the quality of life of farmworkers? (Question 6)	• Oral health quality of life.	

In qualitative research, data may be displayed by selecting key quotes, building tables, or using diagrams to display theories that emerged from a qualitative study (Cohen & Crabtree, 2006; Corden & Sainsbury, 2006). Below, data were grouped and displayed in a set of tables that reflect major themes that emerged from the oral health interview guideline. In addition, selected respondents' quotes included under research questions illustrate important points of consensus. Even though participants' statements were translated to English, the translation maintained similar syntax, vocabulary and opinions,

as expressed by farmworkers in Spanish. It was important to provide the context and the "flavor," to the extent possible, in the translation. Text responses were given numbers preceding each comment to identify the particular participant source. Each participant was assigned the number corresponding to the order of the interview (e.g., interviews 1–14).

Qualitative Research Questions

(Question 2). *What is the social construction of "the mouth," as perceived by this sub-group of the Hispanic population?*

The theme that emerged from participants' responses was understanding of the mouth. The theme was then divided into two codes: part/function and connection (see Table 21). Interview participants described what their perception of the mouth was as well as the importance to their physical well-being.

Understanding of the mouth

Hispanic migrant farmworkers saw the mouth as an integral part of their bodies. In addition, they believed there is a mouth-body connection.

***Part/function*:** Hispanic migrant farmworkers knowledge and beliefs about the "mouth" included the mouth as a part of the body, an organ, and also an instrument that provides different function, such as the ability to chew food, laugh, and talk. For them, the mouth included teeth, gums, the tongue, lips, cheeks, glands among other supporting parts.

Participant 1 stated: "The mouth is an essential part of our body…the instrument you use to laugh, talk, and eat…has the teeth and all that it is inside like the tongue, cheeks, and gums."

Participant 4 responded: “Many people will say it is an organ, but for me is one of the most important parts of your body. You need it to eat every day, if not, you cannot live. You eat with your mouth…It is made out of the teeth, lips, and a tongue.”

Participant 10 mentioned: “Sometimes we forget about it and I think it should be the number one part of the body that everybody should pay attention to. In the mouth is where we find the sense of taste. We eat and we talk with the mouth…the mouth has glands, teeth, cheeks and a tongue.”

***Connection*:** Hispanic migrant farmworkers perceived oral health as a general component of health and well-being. Many considered that problems in the mouth affected other parts of the body. Some of them had little knowledge regarding oral health and the connection with systemic diseases such as diabetes and HIV. Others presented some myths and misconceptions related to oral health.

Participant 3 responded: “I did not know that when you are diabetic and because of your blood and your glucose, you are more susceptible to have problems in your mouth. I was surprised when I looked at that brochure at the clinic.”

Participant 8 voiced: “Everything is connected. If you have problems in your mouth, then you have problems with your stomach.”

Participant 11 expressed: “I know through the mouth a doctor can detect other illnesses such as diabetes, cancer or HIV…bacteria can get into your teeth and produce many infections. It is important, so the infections are not spread to other parts of our body.”

Table 21. Understanding of the mouth

Codes	Emergent theme: Understanding of the mouth
Part/ function In your own words, what do you understand by the word "mouth"?	*Farmworkers own words* **P 1:** "The mouth is an essential part of our body."; "The instrument you use to laugh, talk, and eat."; "Has the teeth and all that it is inside like the tongue, cheeks, and gums." **P 2:** "The mouth is a very special part of the body that we use to talk and eat. It is composed of teeth, the tongue, and lips." **P 3:** "The mouth can transmit a message, can educate and can also destroy a person." **P 4:** "Many people will say it is an organ, but for me is one of the most important parts of your body. You need to eat every day, if not, you cannot live. You eat with your mouth."; "It is made of the teeth, lips, and a tongue." **P 5:** "The mouth receives all the food, has the teeth, the gums, and the tongue." **P 6:** "The mouth sometimes gets us in trouble but it is very important. I know the mouth is made of the teeth, tongue, and it give us the taste." **P 7:** "The mouth consists of many things like the teeth, and you need to take care of them." **P 8:** "The mouth has teeth, gums, tongue, and a palate." **P 9:** "The mouth has teeth, gums and a tongue." **P 10:** "The mouth, it is an important part of our body. Sometimes we forget about it and I think it should be the number one part of the body that everybody should pay attention to. In the mouth is where we have the sense of taste. We eat and we talk with the mouth."; "The mouth has glands, teeth, cheeks and a tongue." **P 11:** "The mouth for me is the organ that helps us chew our food with the teeth. It consists of teeth, gums, arteries and a tongue."; "In the mouth you can have decay, and also infections." **P 12:** "The mouth is part of the body, has gums, teeth, and a tongue."; "If you have bad breath it means you have something bad in your mouth." **P 13:** "The mouth is a part of the body. It has teeth and gums and there are also cavities."
Connection Do you think there is any relationship between problems in your "mouth" and conditions in other parts of your body?	**P 3:** "I did not know that when you are diabetic and because of your blood and your glucose, you are more susceptible to have problems in your mouth. I was surprised when I looked at that brochure at the clinic." **P 4:** "Many people who have no teeth or dentures do not have a good digestion because they cannot chew their food well and have gastric problems." **P 5:** "I think that when you do not clean your teeth every day, then all that dirt that you have in your teeth is going to the stomach. All of this can cause diseases." **P 7:** "If you do not clean your teeth and your dentures, your stomach hurts. Cavities have viruses, and they can affect other parts of your body." **P 8:** "The mouth, we have to keep clean in order to have a healthy body. "Everything is connected. If you have problems in your mouth, then you have problems with your stomach." **P 9:** "If we do not take care of the mouth, you can get different illnesses through the mouth." **P 11:** "I think if we do not protect the mouth we can have problems in the rest of our body, as the mouth is one part of it. We must take care of our teeth with good hygiene. We also need to take care of our gums, so they do not bleed. I know through the mouth a doctor can detect other illnesses such as diabetes, cancer or HIV."; "Bacteria can get into your teeth and produce many infections. It is important that infections are not spread to other parts of our body." **P 14:** "Everything that you eat enters your body through the mouth. If you have big problems in your mouth you should go to the doctor for a checkup."

(Question 3). *What is the Hispanic migrant farmworker construction of oral health?*

The theme that emerged from participants' responses dealt with the meaning of oral health. The theme was then divided into two codes: socialization and attitudes toward oral health (see Table 22).

Meaning of oral health

Oral health for adult Hispanic migrant farmworkers referred to the overall health of the teeth, gums, and other areas of the mouth. The value of oral health was constructed during their childhood mainly derived from family members, school messages and interactions with school staff. Over the years they have interpreted and assimilated these oral health messages and have implemented their own oral health practices.

Socialization: Adult Hispanic migrant farmworkers constructed the meaning of oral health through their early socialization experiences in their country of origin. In interactions with family members and in school, values related to oral health practices were transmitted to them. In addition, since coming to the United States, they have reinforced their early socialization learning with messages received in visits to the migrant community clinic.

Participant 4 recalled: "Since the first year of school, we were taught about the mouth and got our first free toothbrush…also, my mom taught me about oral health in Mexico."

Participant 5 stated: "When I was little, my dad and my mom taught me how to brush my teeth. Also, I was taught at school in Mexico...here at the community clinic, there is information about diabetes and oral health. The clinic has a television program

that shows information about the connection of diabetes and oral health, like with your gums."

Participant 14 commented: "In my country, when I was little. They taught me how to brush my teeth at the school."

Attitudes toward oral health: Adult Hispanic migrant farmworkers relied on their earlier socialization to construct the meaning of oral health. Based on their earlier exposures, for them oral health means mouth hygiene including gums, tongue and teeth. When asked what they knew about oral health, three participants responded:

Participant 2: "Oral health is having good hygiene in the mouth. You need to wash it, I mean, when you have cavities, you need to take care of them, and if you're missing teeth and have the money, you need to replace them."

Participant 4: "Oral health is the health of your mouth, tongue, gums, and teeth"

Participant 7: "Oral health means brushing your teeth at least one time. But it is better in the morning and evening. I think that oral health is part of your daily cleaning such as taking a shower; combing your hair, etc."

Table 22. Meaning of oral health

Codes	Emergent theme: Meaning of oral health
Socialization Have you received information regarding oral health?	*Farmworkers own words* **P 3:** "I learned about oral health in Mexico, when I went to school"; "Here in the U.S I have seen information for diabetes in the community clinic. The dentist and the hygienist have given me some information when I have been in their offices."; "When I was pregnant my gums were bleeding a lot. I had gestational diabetes. When you are pregnant you need to take care of your teeth." **P 4:** "Since the first year of school, we were taught about the mouth and got our first free toothbrush."; "My mom taught me about oral health in Mexico."; "The dentist and the hygienist here explained to me what they were going to do in my mouth. They also taught me how to floss my molars, and how to brush my teeth correctly." **P 5:** "When I was little, my dad and my mom taught me how to brush my teeth. Also, they taught me at school in Mexico. In addition, here at the community clinic, there is information about diabetes and oral health. The clinic has a television program that shows some information about the connection of diabetes and oral health, like with your

	gums." **P 6:** "My aunt who raised me taught me how to brush my teeth. They also gave me some oral health education at school." **P 8:** "What I learned was because of what my parents taught me in Mexico." **P 10:** "At home in Mexico and also at school I received oral health information." **P 11:** "In my country. My parents taught me how to take care of my teeth as well as in school."; "Here, they have different brochures at the entrance of the health clinic here. There is one brochure that is about diabetes and oral health." **P 12:** "In Mexico, when I was little my parents and then in school." **P 13:** "I learned about oral health in Mexico at my school." **P 14:** "In my country, when I was little. They taught me how to brush my teeth at the school."
Attitudes toward oral health What do you understand by the words "oral health"?	**P 2:** "Oral health is having good hygiene in the mouth. You need to wash it, I mean, when you have cavities, you need to take care of them, and if you're missing teeth and have the money, you need to replace them." **P 3:** "Oral health is hygiene, brushing your teeth, brush your tongue, maintaining good health on your gums"; **P 4:** "Oral health is the health of your mouth, tongue, gums, and teeth." **P 6:** "Oral health is hygiene, having your teeth with a beautiful smile, straight teeth with no problems." **P 7:** "Oral health means brushing your teeth at least one time. But it is better in the morning and evening. I think that oral health is part of your daily cleaning such as taking a shower; combing your hair, etc." **P 10:** "Oral health means taking care of your mouth every day. You need to brush your teeth and gums, and visit the dentist at least twice a year." **P 11:** "Oral health means that you need to brush your teeth, two or three times a day, every day" **P 12:** "Oral health is taking care of your mouth by brushing your teeth." **P 13:** "Oral health is taking good care of your mouth, getting in touch with your dentist, and protecting your teeth." **P 14:** "Oral health means taking care of your mouth. I rinse my teeth with Listerine so I do not have cavities."

(Question 4). *What are the cultural patterns of dental health utilization?*

Utilization of dental care and unmet dental needs were very similar among all participants regardless of country of origin (Mexican, Ecuatorian, Venezuelan, and Salvadorian) in this study. This question was answered with three themes that emerged from participants' responses (history of dental care, dental problems, and barriers to dental care). Four sub-codes emerged in supporting barriers to dental care. These were lack of financial resources and health/dental insurance, language barriers, fear of the dentist, and transportation problems. Participants agreed that they generally wait until

they were "in pain" before seeking dental services, at which time their visits become an emergency.

History of dental care

Participants indicated that most dental visits were related to emergencies, rather than preventative. Pain led most to treatment; while absence of pain was the primary reason for not seeking care on a regular basis. In addition, many visited the dentist while they were in their country of origin since it was available at much lower cost (see Table 23).

Participant 2 mentioned: "Recently they had to pull one tooth; I think the last one in the back. I had to have surgery; the tooth was in really bad condition, I had too much decay."

Participant 7 noted: "The last time I went to the dentist was about six months ago. I had to go for an emergency. They had to remove a tooth, it hurt so much and they could not save it."

Participant 8 shared her experience*:* "I think it was over a year ago. I had a bad toothache, and they gave me antibiotics. I was supposed to be back to get that tooth fixed, but after I finished the antibiotics the pain went away, so I decided not to go back to the dentist."

Table 23. History of dental care

	Emergent theme: History of dental care
Have you ever visited a dentist? What were the reasons for visiting	*Farmworkers own words* **P1: "**I would say I visited the dentist more than a year ago." **P 2:** "Recently they had to pull one tooth; I think the last one in the back. I had to have surgery; the tooth was in really bad condition, I had too much decay." **P 3:** "I have visited a dentist in Mexico and here too."; "I went to the dentist recently and they told me that I had an infection on a tooth and that they need to remove it. " **P 4:** "I went recently because I had caries." **P 5:** "I do not visit very often, I went two years ago. I usually go if I have a problem."; "I have gone because I needed a tooth to be fixed. They put anesthesia on the gum, but that

the dentist?	hurts a lot. Other times, you have to be there with your mouth open for so long that you cannot feel your jaw anymore." **P 6:** "Since I moved to the U.S 15 years ago, I have only been to the dentist twice. The last time like two years ago, they told me that they need to pull out all my teeth. But then he told me that he could not make me a denture. When he said that to me, I said to myself, I do not want to be without teeth. I think that is the reason why I do not want to go back again" **P 7:** "The last time I went to the dentist was about six months ago. I had to go for an emergency. They had to remove a tooth, it hurt so much and they could not save it.";" They made fake teeth for me, and upper and lower dentures." **P 8:** "I think it was over a year ago. I had a bad toothache, and they gave me antibiotics. I was supposed to be back to get that tooth fixed, but after I finished the antibiotics the pain went away, so I decided not to go back to the dentist." **P 9:** "Over a year ago, I had to go because one tooth hurt really badly, and they had to pull it, but it was In Mexico because over there it is cheaper. Before I used to go the rural clinic but now everything has changed." **P 10:** "The last time that I was in Mexico, I got all my teeth fixed because it is cheaper. When I was in Mexico, I always took care of my teeth, but since I have been here, seven years, I have not had the opportunity to visit a dentist to fix my teeth. I did it just one time for an emergency this year. It is very expensive, and I have other priorities that I need to fill in my life. I know, I need to go for a cleaning and also they need to take out some teeth." **P 11:** "I visited earlier this year. I had a problem with the wisdom tooth, so they had to remove it."; "I paid cash. I went to the Martin Luther King which is the rural clinic here in Homestead. If you work in the field, they put a low rating which is called "A" classification; this means that you pay less money for any of the procedures that you need. For example, I think they charged me $50 for a cleaning." **P 12:** "I visited the dentist more than a year ago when I went to Mexico. I had a cleaning done and they also fixed a tooth that was chipped." **P 13:** "I went like five years ago in Mexico and here I saw one like six months ago"; "I had a cavity in one of my teeth, and it was bothering me a lot. The dentist fixed it, and now I am fine." **P 14:** "I went more than a year ago because I had some cavities and they also did a cleaning."

Dental problems

Oral health problems were prevalent among migrant farmworkers. These problems included untreated caries, periodontal disease, and missing or broken teeth (see Table 24).

Participant 2 observed: "I have tons of decay…since I was in Mexico, I had a lot of problems. I think I lost teeth since I was 11 or 12 years old."

Participant 7 mentioned: "I lost many of my teeth…if you have bad teeth, and they hurt your face becomes swollen; you get a headache, your gums bleed."

Participant 10 commented: “I have been eating a lot of candies and I think I have a broken tooth...I had an abscess, it gave me bad odor in my mouth and it was very hard to eat.”

Table 24. Dental problems

	Emerging theme: Dental problems
Can you tell what problems you have/had in your “mouth”?	*Farmworkers own words* **P 2:** “I have tons of decay”; “Since I was in Mexico, I had a lot of problems. I think I lost teeth since I was 11 or 12 years old.” **P 3:** “I think I have tooth decay and gingivitis.”; “When I was pregnant my gums were bleeding a lot. I had gestational diabetes.” **P 4:** “The doctor explained that I have cavities because I drank too much coke, and I was also eating a lot of candies and was not brushing my teeth.” **P 5:** “I have red gums, crooked and chipped teeth.” **P 6:** “When I was little, the baby teeth did not fall out and then I had both the baby teeth and the permanent. “The last time, they told me that they need to pull out all my teeth. But then he told me that he could not make me a denture.” **P 7:** “I lost many of my teeth.”; “If you have bad teeth, and they hurt your face becomes swollen; you get a headache, your gums bleed.” **P 8:** “Cavities. They give you bad toothaches.” **P 9:** “I had to go because one tooth hurt really badly, and they had to pull it.” **P 10:** “I have been eating a lot of candies and I think I have a broken tooth.”; “I had an abscess, it gave me bad odor in my mouth and it was very hard to eat” **P 11:** “In my mouth, I have decay.”; “I had a problem with the wisdom tooth, so they had to remove it.” **P 12:** “I have bleeding gums and loose teeth.” **P 13:** “My teeth hurt, it is because I have decay in them.”

Barriers to dental care

Several codes contributed toward the construction of this theme. Participants cited several barriers to dental care such as lack of financial resources and health/dental insurance, language barriers, fear of the dentist and transportation problems. All of these barriers impacted their access to and use of dental health services (see Table 25).

Lack of financial resources and health/dental insurance: Participants expressed concerns regarding the high cost of health care services. Repeatedly throughout the interviews, farmworkers reported that visiting the dentist was very expensive. Moreover,

the vast majority of participants responded that they do not have either health or dental insurance. This was a major factor contributing to the limited access and use of dental health care services. Out of pocket was the most common form of payment for dental care services and lack of health insurance resulted in their unlikely use of the U.S. health care system. Usually, they delay dental care until visiting their home country, since it is available at much lower costs. This practice was reaffirmed by all interviewees. For example see below:

Participant 7: "I am waiting to go to my country, so I can go to the dentist. Here is very expensive, and I do not have money…right now I try to go every time I visit my country because I do not have dental insurance. Here they charge a lot of money for a cleaning and more to fix your teeth..."

Participant 8: "Sometimes we do not have time or money to take care of our mouth."; "Going to the dentist is very expensive."; "I do not have dental, or medical insurance."

Participant 9: "It is very expensive, and I do not have the money to pay…Over a year ago, I went to Mexico because over there it was cheaper. Before I used to go the rural clinic but now everything has changed. Even though you are a farmworker and the price is supposed to be cheaper, now it is about the same as going to a private dentist. They were giving us a card depending on our income, but now that card costs like $100 plus the treatment of your teeth. That is a lot of money, so I prefer to wait and go to Mexico."

Language barriers: All participants indicated concerns related to language which they observed was as a major barrier. Salient language problems included lack of English

skills, and the absence of health professionals fluent in Spanish. Specifically, participants with no or limited English proficiency indicated that these limitations had a negative impact on their ability to seek and access dental health care services.

Participant 7 voiced: “I feel much more comfortable with my dentist talking to me in Spanish. I do not speak English, and it is better to communicate your problems in your own words.”

Participant 9: “I could not understand him. They had to bring an interpreter to explain what he was telling me.”

Participant 11: “I prefer to speak in Spanish, but sometimes the staff and the dentist at the clinic only speaks English, so they have to get a translator. Most of the staff is African American and they speak English.”

Fear of the dentist: Participants expressed dislike, apprehension, or fear related to dental care and dental procedures. Hispanic migrant farmworkers reported that in the past they had bad experiences and now they are left with bad memories of dental care. This is why some wait until their pain becomes unbearable to go to the dentist to seek care.

Participant 5 pointed out: “I do not really like to go to the dentist. I have gone because I needed work on a tooth. They injected the gum, and that hurts a lot. Other times, you have to be there with your mouth open for so long that you cannot feel your jaw anymore. That is why sometimes I prefer not to go to the dentist, and just brush my teeth at home.”

Participant 8 voiced: “I am afraid of the dentist. I do not like the needles that they use. Also, I do not like the sound when they are cleaning the teeth.”

Participant 13 indicated: "I panic when I go the dentist…..the problem is that I am afraid of the dentist. I do not like to go…every time that I go it is because my teeth hurt, and when they are fixed, they hurt even more. The experience is not good."

Transportation problems: Many migrant farmworkers do not own a vehicle and must rely on other means of transportation, such as provided by family members, friends or public transportation, which many times is limited. For many, lack of transportation delayed and limited their access to dental health care services.

Participant 6 explained: "My husband took me; I do not drive a car."

Participant 7 commented: "I always go with my daughter, she takes me."

Participant 10 mentioned: "I always use the bus. I do not have a car."

Table 25. Barriers to dental care

Codes	Emerging theme: Barriers to dental care
Lack of financial resources and health/dental insurance What are the reasons why you have not visited the dentist?	*Farmworkers own words* **P 2:** "Here they are more interested in the money; good oral health this is your problem. They want you to pay the treatment and that is it."; "Going to the dentist is a luxury, and not a necessity. It costs a lot of money to take care of your teeth and to have them fixed." **P 3:** "It is expensive when you have a major problem." **P 4:** "Here in the United States it is very expensive. If you go every year it is like eighty dollars, or one hundred for a cleaning, but if you have cavities or other problems it is more expensive. For example, my sister went to Mexico to fix her teeth; over there it was much cheaper. For the price of one tooth here, she fixed all her mouth in Mexico."; "If they put anesthesia they charge you more money, so it is more expensive. I prefer without anesthesia because it was cheaper" **P 5:** "I should go for cleanings, but they are expensive."; "That is why I cannot afford to go to the dentist." **P 6:** "I want to go here, but it is very expensive."; "The doctor has advised me to go to the dentist, but here is too expensive. I am waiting to go to Mexico and probably try to go there." **P 7:** "I am waiting to go to my country, so I can go to the dentist. Here is very expensive, and I do not have money."; "Right now I try to go every time I visit my country because I do not have dental insurance. Here they charge a lot of money for a cleaning and more to fix your teeth. But if you have an emergency, you need to go despite the money."; "Here they charged me for cleaning and an extraction $550. It was a lot of money." **P 8:** "Sometimes we do not have time or money to take care of our mouth."; "Going to the dentist is very expensive."; "I do not have dental, or medical insurance." **P 9:** "It is very expensive, and I do not have the money to pay."; "Over a year ago, I

	went to Mexico because over there it was cheaper. Before I used to go the rural clinic but now everything has changed. Even though you are a farmworker and the price is supposed to be cheaper, now it is the about same as going to a private dentist. They were giving us a card depending on our income, but now that card costs like $100 plus the treatment of your teeth. That is a lot of money, so I prefer to wait and go to Mexico." **P 10:** "It is very expensive, and I have other priorities that I need to fill in my life. I know, I need to go for a cleaning and also they need to take out some teeth. The last time that I was at the doctor, he told me that I really need to visit a dentist, but when you are married, and have kids, they are always your priority, and then you forget about yourself. This happened to me in this country."; "When I went in they charged me $50 for the consultation and then I paid $75 on the day that they extracted the tooth. As a total I paid $125. This is a lot of money." **P 11:** "We currently do not have health insurance, and of course no dental."; "Economic reasons. Even though it is cheaper with the card, going to the dentist is still expensive." **P 12:** "Going to the dentist is very expensive."; "I do not have insurance."; "I prefer to wait and go to Mexico, it is cheaper over there." **P 13:** "When I go to the dentist, I pay in cash. Going to the dentist in the U.S is very expensive, which is why I prefer to go to Mexico." **P 14:** "The problem is that going to the dentist is very expensive, so you wait until something hurts to go and then they charge you a lot of money because they have to fix your whole mouth." "I do not have dental insurance. I always pay cash."
Language barriers In which language would you feel more comfortable describing problems related to the health of your "mouth and teeth	**P 6:** "In Spanish, my English is not very good." **P 7:** "I feel much comfortable with my dentist talking to me in Spanish. I do not speak English, and it is better to communicate your problems in your own words." **P 8:** "I prefer it when they talked to me in Spanish." **P 9:** "I could not understand him. They had to bring an interpreter to explain what he was telling me." **P 11:** "I prefer to speak in Spanish, but sometimes the staff and the dentist at the clinic only speak English, so they have to get a translator. Most of the staff is African American and hence they speak English." **P 12:** "Of course in Spanish. It is better to communicate in your own language." **P 13:** "Of course I like when they talked to me in Spanish!"
Fear of the dentist Are you afraid of the dentist?	**P 2:** "I have always been afraid of the dentist." **P 7:** "Every time they pull out a tooth the pain is horrible. After that, you do not want to go back to the dentist." **P 5:** "I do not really like to go to the dentist. I have gone because I needed work on a tooth. They injected the gum, and that hurts a lot. Others times, you have to be there with your mouth open for so long that you cannot feel your jaw anymore. That is why sometimes I prefer not to go to the dentist, and just brush my teeth at home." **P 6:** "I had a bad experience with the dentist in Mexico." "When I was little, they took me to the dentist in Mexico, and he pulled out all the baby teeth without anesthesia." **P 8:** "I am afraid of the dentist. I do not like the needles that they use. Also, I do not like the sound when they are cleaning the teeth." **P 9:** "I am afraid of the dentist. Every time that I go to the dentist they pull a tooth, and then I bleed a lot. That is why I do not like to go to the dentist." **P 11:** "Oh yeah, in our country they taught us this fear of the dentist because of the

	pain that it causes and all the weird noises that you hear at the office." **P 13:** "I panic when I go the dentist."; "The problem is that I am afraid of the dentist. I do not like to go."; "Every time that I go it is because my teeth hurt, and when they are fixed, they hurt even more. The experience is not nice."
Transportation problems What sort of transportation do you use to go to the dentist?	**P 6:** "My husband took me; I do not drive a car." **P 7:** "I always go with my daughter, she takes me. Here I'm afraid to drive. I'm very nervous." **P 8:** "The bus, we do not have a car." **P10:** "I always use the bus. I do not have a car." **P 14:** "I use the bus; I do not have a car."

(Question 5). *What is the shared social and cultural construction of oral health care among this group?*

Socio cultural patterns relevant to dental care were divided in two themes: taking care of the mouth/teeth, and medications.

Taking care of the mouth/teeth

For adult Hispanic migrant farmworkers oral health self-care practices such as brushing, flossing, and the use of mouthwash, defined their preventive oral health practices. And, they reported, adequately incorporating these practices in their daily routine. Tooth brushing was the most commonly described oral health practice with a frequency that ranged from once a day to three times per day. In order to maintain good oral health and prevent oral health problems, most noticed that the least they could do was to keep their teeth clean. Brushing their teeth at night was a common practice. They reasoned that since they use their mouths all day long, if they were not "to brush out all the germs and bacteria from their teeth, those germs will gradually destroy their teeth resulting in cavities" (see Table 26).

Two interview participants commented about their oral health care practices:

Participant 3: "I brush my teeth with toothpaste…twice a day, in the morning and in the evening...I like to brush my teeth at night because I have used my mouth for chewing all day long, so at night if I do not brush my teeth, I cannot sleep…I floss and I also use a mouthwash."

Participant 6: "I brush my teeth in the morning and at night. I also rinse my mouth with Listerine. There is not much I can do now for my teeth, but I try to keep them clean."

Participant 10: "I brush my teeth, floss, and I use a mouthwash every day...I brush my teeth in the morning and at night. I do not like my mouth to smell bad during the day, and at night I do not want all that bacteria to eat anyway my teeth."

Table 26. Taking care of the mouth/teeth

	Emerging theme: Taking care of the mouth/teeth
Can you please describe your current oral health care practices?	*Farmworkers own words* **P 1:** "Trying to brush my teeth after I eat."; "I brush my teeth every day in the morning and then before I go to bed." **P 2:** "Sometimes two times per day, once in the morning and at night." **P 3:** "I brush my teeth with toothpaste."; "Twice a day, in the morning and in the evening."; "I like to brush my teeth at night because I have used my mouth for chewing all day long, so at night if I do not brush my teeth, I cannot sleep."; "I floss and I also use a mouthwash." **P 4:** "I brush my teeth. I try to do it two and if I have more time, three times a day, at least once in the morning and once at night. For me brushing my teeth before going to sleep is very important because my mouth is going to be closed for eight or seven hours without rinsing." **P 5:** "I try to brush my teeth every day. I try to do it once in the morning and once at night."; "I try not to eat things that are very hard, acid, hot or cold. I brush my teeth and my tongue."; "I think that you really need to brush your teeth before you go to bed. It is when you've already eaten everything, and if you do not brush all the germs will work on your teeth while you are sleeping and they can produce cavities." **P 6:** "I brush my teeth in the morning and at night. I also rinse my mouth with Listerine. There is not much I can do now for my teeth, but I try to keep them clean."; "For me, it is important to brush at night because you have the remains of everything you have been eating during the day inside your mouth, and that produce cavities." **P 7:** "I brush my teeth in the morning and at night; I put my dentures in water with an effervescent pill while I 'm getting dressed. I also rinse them with Listerine. I also clean them at night before I go to bed."; "Brushing is important, in the morning if you go to

	work you are going to be talking to people and you should have good breath. Also, before going to sleep many viruses and bacteria will be in your mouth for a long time." **P 8:** "I brush my teeth every day. I tried to do it in the morning, and then at night before I go to sleep."; "When you get up, you mouth has been sitting there for so many hours, and a lot of bacteria has worked on your mouth, so it is important to take everything out with good brushing." **P 9:** "You must keep it clean by brushing your teeth at least twice a day. That way you do not get any illnesses."; "I brush and floss my teeth."; "You have been eating all day, your mouth is dirty, and if you are lazy and do not brush your teeth at night, you can get cavities. That is what happened to me. I was always lazy to brush my teeth." **P 10:** "I brush my teeth, floss, and I use a mouthwash every day."; "I brush my teeth in the morning and at night. I do not like my mouth to smell bad during the day, and at night I do not want all that bacteria to eat anyway my teeth." **P 11:** "I take care of my teeth by brushing and flossing. I avoid sweets; I brush in the morning and before I go to sleep." **P 12:** "I brush regularly every day one time in the morning, and then at night. I also use floss."; "It is better to brush at night because you have been eating all day, so you have a lot of residue in your mouth. If you do not take it out, then it will stay there all night for eight to ten hours, and that can damage your teeth." **P 13:** "I brush my teeth in the morning and at night." **P 14:** "I rinse my teeth with Listerine so I do not have cavities."; "Brushing is part of my daily routine. After I shower in the morning, I brush my teeth and also before I go to bed at night."

Medications

Adult Hispanic migrant farmworkers rely on self-care behavior therapies, to prevent or to treat oral health problems. Many of these therapies were not prescribed or recommended by a health-care professional. Commonly reported home methods to relieve toothache pain and swelling included home remedies (e.g., mint leaves, garlic, cinnamon clove) and over-the-counter pain medications such as Tylenol and Advil.

In addition, they use antibiotics prescribed at the clinic, or purchased without prescription, in their home country. Antibiotics are used as a means to arrest pain and inflammation in order to avoid preventive care once the problem subsides (see Table 27).

Home remedies: Migrant farmworkers first rely on traditional remedies, instead of prescription medicines when treating oral health problems. As a result, these homemade treatments delay their visit to the dentist. The list of home remedies included rinsing

mouth with salt and oxygenated water, tea with mint and soda, and pepper or rosemary water. In addition to placing on the affected area garlic with mint leaves, carbonate, or cinnamon clove.

Participant 6 indicated: “I used garlic directly where I felt the pain. I also used cinnamon cloves; I have rinsed with salt and oxygenated water, tea with mint and soda. In addition, I put mint leaves with carbonate on my lips when I have canker sores...You have to switch between all these remedies. Sometimes they work, and sometimes they do not. But if you cannot go to the dentist, you need something that takes away that horrible feeling and pain.”

Participant 8 expressed: “I have used garlic. I also rinse my mouth with salt and warm water. All of these have helped me a lot when I have been in pain.”

Participant 9 voiced: “I used garlic with lemon and salt, and put it where I had the pain, and this sometimes works because the pain goes away.”

Over the counter/prescriptions: Hispanic migrant farmworkers also use over the counter medications to avoid going to the dentist, wishing the pain will go away and hoping that they can save some money by delaying their dental treatment. Antibiotics fulfill a similar function as over the counter medications in these situations. Even when prescribed at the clinic, they were used as a means to arrest the pain and thus do not find necessary to return to the clinic for preventive care once the pain subsides. This practice was also repeated with the purpose of avoiding visiting the dentist in instances where they purchase the antibiotics, without prescription, in their home country.

Participant 2: “Orajel to calm the pain and some Tylenol…You need to chew an Anacin, and leave it there for a while.”

Participant 8 stated: "I take Advil, when I am in pain. One time I went to the clinic because I had an infection and they gave me antibiotics."

Participant 9 talked about: "When I had a toothache, I took Tylenol or Advil, like every four hours. Also, when I had inflammation on my face they gave me antibiotics."

Table 27. Medications

	Emerging theme: Medications
Home remedies Have you used any home remedies when you have "mouth." pain or tooth ache?	*Farmworkers own words* **P 3:** "I used cinnamon clove when I had the toothache. I also used mint leaves with carbonate when I had canker sores." **P 4:** "I put garlic with mint leaves and carbonate. I made like a paste to put over the tooth. This works and the pain goes away, of course for a while, but meanwhile you feel much better." **P 5:** "I crushed cinnamon clove, and put in on a cotton ball and put it on the tooth that hurts. It is like an anesthetic." **P 6:** "I used garlic directly where I felt pain. I also used cinnamon cloves, I have rinsed with salt water, oxygenated water, tea with mint and soda. In addition, I put mint leaves with carbonate on my lips when I have canker sores."; "You have to switch between all these remedies. Sometimes they work, and sometimes they do not. But if you cannot go to the dentist, you need something that takes away that horrible felling and pain." **P 7:** "I used pepper or put rosemary water on the teeth that hurts." **P 8:** "I have used garlic. I also rinse my mouth with salt and warm water. All of these have helped me a lot when I have been in pain." **P 9:** "I used garlic with lemon and salt, and put it where I had the pain, and this sometimes works because the pain goes away." **P 11:** "I used a cloth that had some mint over the area that was painful. It helped a little bit." **P 12:** "One time I used some cinnamon clove. I placed it over the tooth. The pain went away immediately." **P 13:** "I used Listerine with hydrogen peroxide. I also used some meant leaves on the area that hurts." **P 14:** "I use cinnamon cloves over the infected tooth to take out some of the pain."
Over the counter/prescriptions Do you take medications when you have problems with your "mouth." and teeth?	**P 2:** "Orajel to calm the pain and some Tylenol."; "You need to chew an Anacin, and leave it there for a while." **P 3:** "Antibiotics for the infection." **P 5:** "The antibiotic that they gave me when they pulled out my tooth." **P 6:** "I have taken ibuprofen to reduce inflammation and pain." **P 8:** "I take Advil, when I am in pain. One time I went to the clinic because I had an infection and they gave me antibiotics." **P 9:** "When I had a toothache, I took Tylenol or Advil, like every four hours. Also, when I had inflammation on my face they gave me antibiotics." **P 10:** "When I had a toothache, I took Tylenol 500. This is the only pill that I took." **P 11:** "I have taken antibiotics when I had a tooth infection." **P 12:** "I took Tylenol." **P 14:** "I used pain killers like Tylenol."

(Question 6). What is the impact of oral health problems on the quality of life of farmworkers?

The theme that emerged most frequently from participants' responses referred to oral health quality of life and to the extent to which oral problems disrupt an individual's normal functioning. Participants were able to articulate perceptions regarding their current oral health status through descriptions of the appearance of their teeth and related this to their sense of self-confidence and self-esteem. They reported the different problems they could face once their teeth decayed. For example, how the process of tooth loss was unpleasant and painful, and in the end inconvenient; also they mentioned the difficulties when wearing a denture.

Oral health quality of life

Hispanics migrant farmworkers have experienced enough oral health complications that have impacted their emotional state. They suffered pain and discomfort while eating and drinking. Participants perceived that their poor oral health status definitely had an effect on their enjoyment of life; even when these were minor, like smiling, laughing or talking to people. Most associated tooth lost with poor oral health quality of life which affected their appearance and self-esteem (see Table 28).

Participant 5 indicated: "I have crooked teeth and sometimes I do not want to smile…I had a broken tooth, it hurt so much. When I went to the dentist, they could not save it. They had to pull it. That makes me feel really bad. Apart from having the hole, there is the pain. I could not go out because of the sun. All of that makes me feel very uncomfortable."

Participant 6 mentioned: "When I am with someone and I remember that I have bad teeth, I cover my mouth…I have been suffering from toothaches since I was little. When toothaches were bothering me, I could not get out of bed. The pain was very hard. I did not want to go outside."

Participant 10 stated: "I am worried that if I go back to Mexico and the dentist decides that he needs to take out any teeth; I will be left with no teeth. This is the same as having a car and then you take out one of the wheels, then the car cannot move in the same way again…when you have a toothache your life is not the same. You just want that pain to go away. It is hard to work, to eat, and even to talk."

Table 28. Oral health quality of life

	Emerging theme: Oral health quality of life
Is your personal appearance important to you? Do you worry about your "mouth." image? Have oral health problems affected your participation in other activities? (Like work, social events, daily life).	*Farmworkers own words* **P 2:** "I try not to laugh a lot, or not open my mouth because I have too much decay."; "A toothache is the worse feeling in this world, it is really bad." **P 3:** "I went to the dentist and they told me that I had an infection and that they need to remove it. I felt so bad, because I really did not want to be without teeth." **P 4:** "If you do not take care of your teeth, despite giving you a bad aspect and bad breath, you are not able to eat. A toothache has been one of the strongest pains I have ever felt in my entire life."; "People look at your mouth, and if you have bad breath or bad teeth, people will notice that, and they can make you feel uncomfortable."; "The pain in my tooth was horrible. I could not do anything. I had to go and get it fixed otherwise it would have driven me crazy." **P 5:** "I have crooked teeth and sometimes I do not want to smile."; "I had a broken tooth, it hurt so much. When I went to the dentist, they could not save it. They had to pull it. That makes me feel really bad. Apart from having the hole, there is the pain. I could not go out because of the sun. All of that makes me feel very uncomfortable." **P 6:** "When I am with someone and I remember that I have bad teeth, I cover my mouth."; "I have been suffering from toothaches since I was little. When toothaches were bothering me, I could not get out of bed. The pain was very hard. I did not want to go outside." **P 7:** "I lost many of my teeth during my pregnancies. Every time I was pregnant, my teeth hurt a lot; I could not stand the pain, so I just wanted them out of my mouth. That is why I do not have many of my teeth. I still have some of them, but they are really bad."; "They made fake teeth for me, upper and lower dentures. It has been a challenge. It is very hard to get use to them, they hurt a lot when I have them in my mouth, but without them I look horrible."; "When I was studying many times I could not go because the pain was very hard, and I had to stay at home. I have also missed some days at work." **P 8:** "A toothache does not provide a warning sign, it just happens suddenly. When you have that kind of pain, you cannot do anything; you just want to be in bed." **P 9:** "If you have one missing or a cracked tooth, you feel very bad, you do not want to

	open your mouth or even laugh."; "I have suffered a lot with my teeth. Sometimes because of the pain I could not sleep, even though I was taking pain killers. The pain is so bad that not even pain killers could take it away. You cannot eat, talk, concentrate or go to work. Many times they give bad headaches." **P10:** "I am worried that if I go back to Mexico and the dentist decides that he needs to take out any teeth; I will be left with no teeth. This is the same as having a car and then you take out one of the wheels, then the car cannot move in the same way again."; "When you have a toothache your life is not the same. You just want that pain to go away. It is hard to work, to eat, and even to talk." **P 11:** "One time I did have a bad pain, a horrible toothache. I did not want to do anything; the pain was so intense that I just wanted to be in bed. I could not eat or drink anything." **P 12:** "If you have a missing tooth, you are self-conscience about it, you do not want to laugh." **P 13:** "People are looking at your mouth when you are talking to them, so you do not want to have a bad looking mouth."; "One time I ate a lot of sweets and one of my fillings came out. That day my tooth hurt so much that I could not eat anything. It was horrible." **P 14:** "When you have problems in your mouth, you feel uncomfortable because it is hard to eat or drink."

Summary

Phase I Quantitative

This study found that 79.5% adult Hispanic migrant farmworkers reported being non-compliant with the ADA and the ADHA recommendation of visiting the dentist at least once a year. Binary logistic regression results indicated that farmworkers who reported need dental treatment were compliant with the recommendation. While those who brushed their teeth more often, experienced oral health impact on a regular basis and most of the time and reported poor self- perception of the condition of the mouth were non-compliant with the recommendation. Hierarchical logistic regression results pointed to those who used floss and reported needing dental treatment were compliant with the recommendation. In contrast, farmworkers who reported poor self-perception of the condition of the mouth were non-compliant.

Phase II Qualitative

Eight themes emerged from the qualitative analysis. These were: 1) understanding of the mouth; 2) meaning of oral health; 3) history of dental care; 4) dental problems; 5) barriers to dental care; 6) taking care of the teeth/mouth; 7) medications; and 8) oral health quality of life.

In chapter V quantitative and qualitative results are discussed. Practical implications of findings and recommendations for future research are also elaborated.

CHAPTER V

DISCUSSION

A sequential mixed-methods explanatory design previously described by Creswell and colleagues (2003), and Tashakkori & Teddlie (1998) was conducted to analyze, compare, and integrate data generated by the survey questionnaire and the ethnographic interviews to answer the mixed-methods research question. This mixed-methods study explored patterns of dental health care utilization in adult Hispanic migrant farmworkers with special emphasis on those who did not comply with the ADA and the ADHA recommendation, while also examining the social and cultural construction of oral health (American Dental Association, 2014; American Dental Hygienists Association, 2007; Doty, & Weech-Maldonado, 2003; Kuthy, Odom, Salsberry, Nickel, & Polivka, 1998).

This chapter is divided into three sections: quantitative, qualitative, and mixed-methods discussion of findings. The first section discusses the quantitative findings related to research question 1. The second section discusses the qualitative findings related to research questions 2-6. The last section discusses mixed-methods findings related to research question 7, where results from both phases of the study were integrated and further contrasted with findings from previous studies. Finally, implications and recommendations for future research are provided.

Discussion of Findings

Phase I Quantitative Discussion of Findings

The literature on farmworkers in the United States report that the majority are males (78%), Mexicans (68%), with an average age of 36 years, and 8th grade as the highest school year completed (Anthony et al., 2010; Carroll et al., 2011; National Center for Farmworker Health, 2009a, 2012b, 2013; Villarejo et al., 2010). Consistent with the above, the majority of participants in the quantitative phase of this study were males (54.3%), with an average age of 36.6 years and an educational attainment of less than high school (68.7%). Contrary to the national trend only 43.2% were born in Mexico.

As already noted, the percent of Hispanics adults who had at least one dental visit in the past year was 49.9% compared with 66.8% of non-Hispanic White adults (Castañeda et al., 2010b). In addition, in a study conducted by Quandt and colleagues (2007) in North Carolina and Virginia, they found that only 20% of Hispanic farmworkers reported dental services within the last year. Despite the high prevalence of oral health problems, this study also found similar results to the above study, as only 20.5% of adults Hispanic migrant farmworkers in South Florida reported being compliant with the ADA and the ADHA recommendation of visiting the dentist at least once a year.

Quantitative Research Question

(Question 1). *"To what extent are predisposing (e.g., age, gender, relationship status) enabling (e.g., acculturation, health insurance) and need factors (e.g., self-perceived need for dental treatment, oral health impact profile on a regular basis and most of the*

time, oral health problems, illness diagnosis) associated with adult Hispanic migrant farmworkers' time since last dental visit?"

Findings presented here point to infrequent use of dental health services among this population, resulting mainly from barriers that limit access to care. Only predisposing and need factors from Andersen's model were associated with dental care utilization; hence results are somewhat different from Andersen's (1995) suggestion that predisposing and enabling factors explain dental health utilization.

Hypothesis 1: All variables considered as part of Andersen's model under the three different domains, will be significantly associated with time since last dental visit. Findings from the binary logistic regression analysis offered only partial support for hypothesis 1.

Predisposing Factors

This study found that farmworkers who brushed their teeth more often were non-compliant with the ADA and the ADHA recommendation of visiting the dentist at least once a year. This result differs from studies conducted with non-Hispanic populations, where tooth brushing frequency was found to be associated with having a recent dental visit (Guiney, Woods, Whelton, & Morgan, 2011; Suominen-Taipale, Widstrom, Alanen, & Uutela, 2000; Tennstedt, Brambilla, & McGuire, 1994). Here results point to how majority of farmworkers were cognitively aware of the benefits of oral health practices and the importance of brushing their teeth twice a day. This is consistent with studies conducted by Lukes & Miller (2002), and Poss & Pierce (2003).

Enabling Factors

Though the literature finds enabling factors important in making resources available to individuals (Andersen, 1995; Andersen et al., 2000; Bustamante et al., 2012; Gelberg et al., 2000; Hoerster et al., 2010), this study did not find enabling factors to be predictors of dental care utilization. This may be partially attributed to the homogeneity of the sample. For example, factors such as income and dental insurance were not incorporated to the analysis because they did not present variability. Above findings are different from those reported in a California study with adult Hispanic migrant farmworkers, where enabling factors, such higher income, larger household size, and a regular source of dental care were associated with prior dental visit; while lack of insurance was associated with delaying dental care (Finlayson et al., 2010).

Needs Factors

This study found that farmworkers who reported perceived dental need were compliant with the ADA and the ADHA recommendation. Of interest, this result contrasts with Gilbert, Duncan, & Vogel (1998) findings with diverse populations where participants who reported dental need were not seeking dental care. Regarding quality of life, studies conducted by Gilbert et al. (1998, 2000) in African Americans and Whites found that participants with oral health problems affecting their quality of life were more likely to seek dental care. In contrast, this study found that farmworkers who experienced oral health impact on a regular basis and most of the time were non-compliant with the ADA and the ADHA recommendation. Furthermore, this study also found that farmworkers who reported poor self-perception of the oral health condition of the mouth

were non-compliant with the ADA and the ADHA recommendation, which is similar to what Gilbert et al. (1998; 2002), and Vazquez & Swan (2003) found in their studies.

Hypothesis 2: Based on Andersen's Model, the following sets of predictors: (Model 1) predisposing factors, (Model 2) predisposing and enabling factors, and (Model 3) predisposing, enabling and need factors will be significantly associated with time since last dental visit. Findings from the hierarchical logistic regression analysis presented only partial support for hypothesis 2.

In model 1, (predisposing factors), and in model 2 (predisposing and enabling factors), farmworkers who brushed their teeth were non-compliant with the ADA and the ADHA recommendation of visiting the dentist at least once a year. Moreover, after controlling for predisposing, enabling and need factors, farmworkers who flossed their teeth were compliant with the ADA and the ADHA recommendation. Most farmworkers were aware of the benefits of oral health practices such as flossing. This is not surprising since flossing teeth has been reported as a tool for maintaining good oral hygiene in different populations (Gilbert, Duncan, Heft, & Coward,1997; Lukes & Miller,2002); Ronis, Lang, Antonakos, & Borgnakke,1998) and has also been associated with recent visit to the dentist (Tennstedt et al., 1994).

Phase II Qualitative Discussion of Findings

Qualitative studies examining reasons underlying oral health behaviors among migrant farmworkers have been rare. An extensive literature review yielded one qualitative study conducted by Carrion et al. (2011) with migrant workers' families in Central Florida. This study that was useful in terms of establishing some basis for

comparison. Researchers found that, 77% of participants were female and born in Mexico and the range of years worked in agriculture was from 3 months to 12 years. Similarly, in the present study, 71.4% (n=10) were females and most born in Mexico. The range of years worked in agriculture, however, was much higher for the Homestead/Florida City area, since it ranged from 7 to 30 years.

Qualitative Research Questions

Qualitative findings provided rich descriptions of participants' patterns of dental health care utilization as well as their social and cultural construction of oral health. It is noted that narrative data of the type collected here would not be generalizable under any condition, even if qualitative participants had been randomly drawn from respondents in the earlier quantitative phase, since the purpose of qualitative data is not statistical inference. But rather, the emphasis lies on discovering properties and qualities that pertain to the questions under investigation. Qualitative data collected during this phase of the study afforded the opportunity to expand current knowledge on oral health in general and farmworkers in particular through the eight themes that emerged: 1) understanding of the mouth; 2) meaning of oral health; 3) history of dental care; 4) dental problems; 5) barriers to dental care; 6) taking care of the teeth/mouth; 7) medications; and 8) oral health quality of life.

(Question 2). *In particular, what is the social construction of "the mouth," as perceived by this sub-group of the Hispanic population?*

Farmworkers who participated in this study were knowledgeable about the mouth as an organ and part of the body. They also spoke of the mouth as an instrument that

performs different functions, such as chewing their food, laughing and talking. In contrast, in their narratives they expressed limited knowledge regarding the association between oral health and systemic diseases. These findings contribute to the existing literature on Hispanics, and especially farmworkers with chronic diseases, who fail to realize the complications resulting from these diseases. Hence, they do not seek oral health care in response to their condition, mainly because of unawareness of the systemic connections and other myths and misconceptions (Arcury & Quandt, 2007; Graham et al. 2005; Pérez-Escamilla, Garcia, & Song, 2010; Quandt et al. 2007; Riley et al. 2008; Yuen et al., 2009).

(Question 3). *What is the Hispanic migrant farmworker construction of oral health?*

Similar to previous studies conducted with farmworkers (Carrion et al., 2011 Woolfolk et al., 1995), and in contrast with a study conducted by Castañeda and colleagues (2010a), low literacy does not apply to this population. Findings yielded here found farmworkers to be knowledgeable and educated on oral health care. In their narratives they talked about the difference between healthy and unhealthy teeth. They associated oral health hygiene practices to good oral health of their teeth, gums, and other areas of their mouths. Repeatedly throughout the interviews and consistent with the literature, they spoke about advice received from elders in their families during their early childhood. These words and advice from respected family members exercised a major influence in shaping their oral health practices (Butani, Weintraub, & Barker, 2008; Lukes & Miller, 2002). They also described how teachers and visiting health professionals at school instructed them on the importance of dental health (formal

socialization) thus supplementing information they had received from parents, family members and friends (informal socialization). Based on their previous socialization and new information received since moving to the U.S. through friends, television commercials, and their new surroundings, they established their own oral health practices and routines. These findings further support the literature on farmworkers that reported peer pressure (what friends and family do and use) and television commercials as major sources of influence in their oral hygiene patterns (Entwistle & Swanson 1989; Woolfolk et al., 1995).

(Question 4). *What are the cultural patterns of dental health utilization?*

Migrant farmworkers in the United States of all ages have worse oral health status than the general population with a higher prevalence of caries and gum disease (Finlayson et al., 2010; Lukes & Miller, 2002; National Center for Farmworker Health, 2009b, 2013; Quandt et al., 2007; U.S. Department of Health and Human Services, 2000). As a result, oral health has been ranked as one of the major health problems facing migrant farmworkers (Entwistle & Swanson, 1989; Frank et al., 2013; Gavaldon et al., 2010; Lukes & Simon, 2005; Quandt et al., 2007). As reported here, oral health problems were also prevalent among the adult migrant farmworker population in South Florida with oral conditions that included untreated caries, periodontal disease, and missing or broken teeth. However serious these conditions, the qualitative analysis revealed that in general, farmworkers did not view them as a priority. Farmworkers further noted that they did not visit dental facilities for preventive measures or for regular routine visits; rather they observed that they sought dental care only if they had problems

or if they were in pain. In the absence of pain, they did not deem dental visits necessary, since they were taking care of their mouth by brushing their teeth twice a day. The urgency of pain in seeking dental care, as observed here, further confirms findings from the published literature that report that pain served as the major driver in seeking dental care among Hispanic migrant farmworkers (Butani et al.,2008; National Center for Farmworker Health, 2009b, 2013; Lukes & Miller,2002; Lukes & Simon, 2005; Villarejo, 2003).

Similar to results from other studies, narratives collected here revealed that low dental utilization rates were related to barriers such as cost, lack of dental insurance, language, and transportation problems (Anthony al et., 2008; Arcury & Quandt, 2007; Goertz, Calderón, & Goodwin, 2007, National Center for Farmworker Health, 2012b; Price et., 2013; Rosenbaum & Shin, 2005; Scott & Simile, 2005; U.S. Department of Health and Human Services, 2000; Villarejo et al., 2000; Villarejo, 2003; Woolfolk et al., 1995). Respondents highlighted their preferences for dental care in their country of origin because of lower fees and perceptions of simpler procedures required to address a problem. Most agreed that dental fees in the U.S. for an extraction are equivalent of what they pay in their native country for a full mouth work. Lack of dental insurance coverage was identified as one of the biggest barriers in dental care utilization. As a result, migrant farmworkers must pay out of pocket for a service that they estimate to be very costly.

Language is also often reported as a common barrier to accessing health services among Hispanics. The majority of all farmworkers in the U.S. are Hispanics and non-English speaking which limit their communication when interacting with primary

English-speaking providers (Feldman et al., 2009; Price et al., 2013). Adult Hispanic migrant farmworkers in South Florida are no different from the larger universe; they too reported language to be a major barrier for dental utilization, as previously reported in the literature (Magana & Hovey, 2003; National Center for Farmworker Health, 2009b; Villarejo, 2000, 2003). In their narratives, participants claimed limited ability in communicating with health care providers regarding their oral health problems and medical history. Often participants depended on others, e.g. relatives and friends, to act as translators, which frequently, they noted, led to frustration.

Transportation was also cited as a barrier to access dental care, consistent with studies by Fallon et al. (2012), Frank et al. (2013), Gavaldon et al. (2010), National Center for Farmworker Health (2012b), and Price et al. (2013). Most migrant farmworkers participating in this study did not own a vehicle and reported relying on relatives, friends or public transportation to access services, this further contributed to limit their opportunities to receive dental care.

In the end, the above cited barriers, as explained by the farmworkers, when added to their everyday family demands of caring for their children and spouses further limit their accessibility to dental care. Their inability to access dental care becomes a major contributor to the prevalence of oral diseases in this population, as previous findings suggest (Arcury & Quandt, 2007; Entwistle & Swanson 1989; Lukes & Miller 2002; Lukes & Simon 2005, 2006; National Center for Farm Workers Health, 2013).

(Question 5). *What is the shared social and cultural construction of oral health care among this group?*

As noted in the literature, cultural beliefs and practices may influence the condition of the teeth and mouth through self–care practices and use of home remedies (Anthony et al., 2010; Arcury & Quandt, 2007; Butani et al., 2008; Connor, 2010; Entwistle & Swanson, 1989; Feldman et al., 2009, Poss et al., 2005; Woolfolk et al., 1995). These practices and beliefs facilitate or act as barriers to accessing health care services. This study found that for adult Hispanic migrant farmworkers, oral health self-care practices, such as brushing and flossing when practiced daily, were perceived as adequate preventive oral health measures. These findings were supported by the literature (Lukes & Miller, 2002; Nurko et al., 1998; Woolfolk et al., 1995). This study further explored Cohen and colleagues' (2007) findings on how low-income minorities manage their oral health problems without seeking professional care. Narratives from Hispanic migrant farmworkers in South Florida suggest that they engaged in a variety of self-care behaviors to manage pain and face swelling resulting from dental conditions, instead of accessing the dental care delivery system. They reported relying on practices, such as traditional home remedies (e.g., mint leaves, cinnamon clove, carbonate, salt and oxygenated water, tea with mint and soda, pepper, rosemary) and self-medication with over-the-counter analgesics (e.g. Oraljel, Tylenol, , Advil). According to interview texts, they did not seek definitive treatment for an oral health problem until their return to their country of origin. When combined these self- management practices resulted in underutilization of dental care services. Similarly, results obtained by Baer & Bustillo

(1998), and Baer & Penzell (1993) found that Florida farmworkers chose to practice in-home care with the use of traditional herbal medicine for palliative care.

(Question 6). *What is the impact of oral health problems on the quality of life of farmworkers?*

The oral health literature suggests that oral diseases, such as dental caries, are highly prevalent in the migrant farmworker population and its consequences are not only physical, but social and psychological, as previously suggested by Naito et al. (2006). Findings yielded by qualitative narratives strongly suggest that farmworkers were cognitively aware of their oral health status; which in their own words, they referred as the condition of their "mouths." They not only demonstrated concern, but understood how the oral health condition of their "mouth" affected their lives. When they knew that their mouth appearance was poor, they became self- conscious and would cover their mouths and teeth while talking, smiling or laughing. They also commented on feeling uncomfortable while eating and drinking. Previous studies among farmworkers and other populations have found similar results for the impact or oral health conditions on their lives, especially when essential functions of the mouth were impaired by the condition, such as eating and speaking (Allen, 2003; Castañeda et al., 2010a; Kaiser Family Foundation, 2012; Slade, 1997US Department of Health and Human Services, 2000; World Health Organization, 2012).

Mixed Methods Discussion of Findings

In order to investigate the questions of interest, a sequential mixed-methods explanatory design (Creswell, Plano Clark, Gutmann, & Hanson, 2003; Tashakkori &

Teddlie, 1998) was employed. The mixed-methods sequential explanatory design consisted of analyzing, comparing, and integrating data generated by the survey questionnaire and the ethnographic interviews to answer the mixed-methods research question (Creswell, 2005; Tashakkori & Teddlie, 2003). The goal when examining the interplay of these two arms of the study was to further explore patterns of dental health utilization with special emphasis on those who did not comply with the ADA and the ADHA recommendation; while also interpreting the social and cultural construction of oral health care among this population.

Mixed Methods Research Question

(Question 7). *How does a mixed methods approach, as employed here, expand current knowledge and overall perspective of the oral health of this underserved population? More importantly, how does this synergistic approach broaden our understanding of the various aspects underlying the oral health of this group?*

The rationale for proposing to mix both types of methods (first quantitative and then qualitative) was based on the theoretical assumption that qualitative findings would provide a much needed insight into participants' patterns of dental care utilization and the social and cultural construction of oral health. As anticipated, the interplay of quantitative and qualitative data brought synergy to findings from each phase and contributed a much needed holistic approach to the overall understanding of results. Below, data are combined to include patterns of dental health care utilization, based on the conceptual model (Andersen, 1968) and generated by the quantitative survey, and the social and cultural construction of oral health obtained from ethnographic interviews (see table 29).

Farmworkers who brush their teeth more often were non- compliant with the ADA and ADHA recommendation, and therefore, took longer to visit the dentist. Moreover, data from the ethnographic interviews revealed that Hispanic migrant farmworkers considered brushing their teeth to be a fundamental aspect of their oral health care. That is, in their comments, they emphasized that they, "are taking good care of their mouth when brushing twice daily." They also emphasized when talking about this practice that "daily brushing is the least that they can do for their teeth." Qualitative data provided a rich description of their oral health self-care practices, supporting the association yielded by the quantitative analysis. This was reinforced through most of their narratives where it became evident that, although they believed in the importance of taking good care of their teeth by brushing, participants did not associate a dental visit as necessarily a preventive measure.

Moreover, survey results indicated that farmworkers who experienced oral health impact regularly and most of the time were non-compliant with the ADA and the ADHA recommendation. And yet and despite this loss of quality of life, still they had not visited a dentist within a year. Ethnographic interviews shed important additional information that further helped to understand this result. When indicating the secondary effects of their dental condition on performing routine activities, such as eating, smiling or laughing, they explained that limited financial resources and higher order priorities delayed their dental visits. Many preferred to wait to their return to their home countries to address their dental problems. They noted that cost in their home countries for dental health was considerably lower.

Despite their poor oral health condition, they would delay regular care because of financial, social, and cultural factors. As their narratives revealed, “rather than visit the dentist,” they chose to rely on home remedies in substitution of treatment. This view is clearly stated by participant 6 when she comments: “You have to switch among all these different remedies, sometimes they work and sometimes not; but if you cannot go to the dentist, then you need something to take away that horrible feeling and pain.” Also, strong family norms, embedded in both social and cultural structures, were found to dictate that family needs occupy a higher order of priorities than individual needs. As participant 10 observed: “When you are married and have kids, they are always your priorities and then you forget about yourself.” When it came to choosing housing, feeding their families or visiting the dentist, they chose the former rather than the latter, not necessarily an ignorant or arbitrary decision on their part; but rather a well embedded and expected cultural response. Other less impactful reasons were offered for non-compliance, such as language, lack of dental insurance, and transportation problems with when combined with the above further contributed to obstacles that prevented or delayed their utilization of dental services among this population of adult Hispanic migrant workers in South Florida.

Finally, farmworkers who reported need for dental treatment and used of dental floss were compliant with the ADA and the ADHA recommendation. Farmworkers indicated that most dental visits were related to emergencies, rather than preventative. Pain drove most individuals to obtain treatment. In addition, during the ethnographic interviews they expressed the use of dental floss as a preventive measure for ensuring

good oral health. Those who flossed their teeth learned this practice while visiting the dentist for preventive care.

Table 29. Mixed – methods analysis

Quantitative Data	Qualitative Data
This study found that 79.5% of adults' Hispanic migrant farmworkers reported being non-compliant with the ADA and the ADHA recommendation of visiting the dentist at least once a year.	Findings in this study indicated that they will seek care only if they have an oral health emergency.
Non-compliance with the ADA and ADHA recommendation (time since last dental visit – over a year)	
Tooth brushing frequency	⟺ They reported brushing their teeth at least once a day as a method of taking care of their mouth and being the least that they can do for their teeth. Many of them felt that dental visits were not necessary, if they did not have any pain because they were taking care of their mouth by brushing their teeth.
Oral health impact on a regular basis and Oral health impact most of the time	⟺ Adult Hispanic farmworkers' perceptions of their mouth concerned them and affected many aspects of their lives. The appearance of their mouth made them self- conscious leading them to cover their mouth and teeth while talking, smiling or laughing. They also reported feeling uncomfortable while eating and drinking. But because of financial reasons and family priorities, they delayed their dental visits.
Self-perceived oral health condition of the mouth	⟺ Although they perceived the overall condition of their mouths as poor, they preferred to delay regular care due to different barriers such as financial reasons, lack of dental insurance coverage, language barriers, and transportation problems. For them dental care was viewed not as a priority and preferred to spend their money in housing, food, and their family/children rather than at the dentist.
Compliance with the ADA and the ADHA recommendation (time since last dental visit – within a year)	
Self-perceived need for dental treatment	⟺ They reported that when they need dental treatment due to an excruciating pain; they will not wait and go to the dentist.
Use of dental floss	⟺ Those who floss their teeth learned this practice while visiting the dentist for preventive care.

Contribution of the qualitative phase of the study to the quantitative phase

The mixed-methods analysis resulted in a synergy between quantitative and qualitative findings. More specifically, qualitative data helped fill existing gaps from the quantitative analysis. For example, the quantitative survey did not explore the reasons for their last visit to the dentist (e.g., last dental visit due to preventive vs. therapeutic) whereas the qualitative analysis further explored this question and obtained their reasons. Participants noted in the ethnographic interviews that they did not visit dental facilities for preventive measures or for regular routine visits; rather they observed that they sought dental care only if they had problems or if they were in pain. This finding, as generated by their narratives, is important in shedding light on the quantitative finding relevant to compliance and non- compliance. From these narratives it is learned that among those who reported visiting the dentist within a year, many do so not necessarily because they were compliant with the ADA and ADHA recommendation, but rather because of the urgency of pain.

In addition, both quantitative and qualitative analyses addressed the issue of barriers to dental care utilization. However, the qualitative analysis provided a richer understanding of such barriers and how participants manage them. For instance, through the ethnographic interviews, participants revealed the utilization of home remedies as an alternative to formal dental care. They also expressed a preference to receive dental care back in their country of origin.

Finally, quantitative and qualitative findings complemented each other regarding the interplay among dental care utilization, oral health knowledge and hygiene practices. In

addressing their lack of health care utilization, participants revealed a cultural orientation that prioritizes family responsibilities over individual needs. The latter reaffirms the extensive literature on Hispanic culture that underscores the value of the family or group over the individual.

Conclusions

The mixed-methods study design employed here provided valuable methodological and feasibility data that proved critical in identifying, understanding and explaining the questions explored in this dissertation. The limitations imposed by one or another method in uncovering relevant facts of interest to the research were avoided. Findings yielded by both approaches point to complex reasons underlying non- compliance, including social, economic, and cultural factors. For instance, from the quantitative survey and corresponding analysis, it was learned that 79.5% of adult's Hispanic migrant farmworkers reported being non-compliant with the ADA and the ADHA recommendation. From the qualitative ethnographic interviews, it was learned that they delayed regular care due to different barriers such as financial reasons, lack of dental insurance coverage, language barriers, and transportation problems. For them dental care was viewed not as a priority; rather they preferred to spend their money in housing, food, and their family/children and not at the dentist.

In addition, adult migrant farmworkers were cognitively aware of the importance of oral health. Their oral hygiene stressed the practice of brushing twice a day as a preventive measure; however, when this behavior was practiced on a daily basis, they believed that it made it unnecessary to seek regular dental care. Their beliefs about oral

health made for a strange predicament since on the one hand, the more they adhered to the norm of brushing twice daily, the less, they believed, it was necessary to visit the dentist on a regular basis.

Migrant farmworkers are an essential part of the U.S agricultural industry and, therefore, given their importance to the economy, it is imperative that this population remains healthy and preserves their quality of life into their later years. The above underlie the purpose of this study and why it sought to make what it deemed to be a valuable and significant contribution to the existing body of knowledge on the oral health of farmworkers and their low dental care utilization.

Limitations

Results presented here must be interpreted in light of their limitations. First, participants were recruited from a specific geographic area: Homestead-Florida City (FL). Second, participants from the nine months parent study follow up were also those who at baseline met the inclusion criteria of at least one episode of unprotected vaginal/anal/oral sex and consumption of alcohol or drug use in the past 3 months (prior to entering the study). Therefore, results are not generalizable to the Hispanic migrant farmworker population because there are many in this group who do not engage in risky behaviors. Third, data were collected through self-reports and were not confirmed by clinical exams; therefore, dental needs, symptoms and perception of their oral health, as described by respondents, could be different from what an oral health care provider would determine. While self-reported data are valuable in assessing needs among adults, self- reports cannot replace clinical assessments. Fourth, oral health data were collected

only at one point using a cross-sectional design, which limits the analyses of differences over time, thus, causality cannot be established. Fifth, enabling factors such as income and dental insurance were not incorporated to the analysis because they did not present variability. The present study included many factors drawn from Andersen's model; however some constructs were not included that could possibly increase its explanatory power. Sixth, specific information pertaining to the timing and nature of last dental visit (e.g., preventive versus therapeutic), were not captured on the survey questionnaire. Seventh, non –compliance, the outcome variable, was measured as time since last dental visit (over a year); hence, farmworkers may not have remembered when last they used dental health services. Eight, though major risk factors for poor oral health also include unhealthy diets, tobacco use, and frequent alcohol use, these factors were not addressed by the model chosen for investigation. Nine, although rich narrative data were collected in the qualitative phase of the study, no generalizations can be drawn. Finally, the study is limited by the focus of the parent study on HIV and not oral health. Despite limitations, the mixed-methods employed here allowed for explaining the meaning underlying non-compliance which it is considered to be one of the major and most important contributions of this research, and also provided a valuable insight into the oral health problems and experiences of adult Hispanic migrant farmworkers in South Florida.

Recommendations

Fundamental to the health status and quality of life of migrant farmworkers is the understanding of the socio-cultural factors and every-day circumstances that underlie their behaviors. An important component of their health and quality of life, as emphasized throughout this dissertation, is their oral health. The latter, of course, has

been the central thrust of this work. While some barriers to dental care have been almost universally identified, there is evidence that for particular groups, such as migrant farmworkers, other important impediments remain unidentified and may present significant obstacles to the improvement of dental health care. While on the one hand, there are complex barriers that may need greater consideration and increased time and effort, other more practical concerns, if responded to, have the potential to dramatically improve their oral health status. For example, migrant community clinics can make a significant difference by including or improving culturally competent services, expanding operations hours, and employing dental professionals who speak Spanish.

Finally, it is suggested that in order to make meaningful improvements in oral health status and oral health access in this population, it is also important to not only understand the farmworkers community as a whole (beliefs, values, norms, cultural differences), but also the dental care providers' perspectives. Utilizing community-based approaches, such as employing health lay workers could make a positive impact and increase utilization of preventive services among this population. Education on the importance of oral health and preventive dental visits should result in an increase in the dental utilization services and thus reduce the development of more serious problems in this population, hence reducing the need for costly treatments.

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