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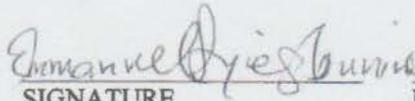
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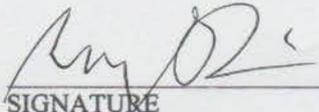
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**Utilization of Oral Health Services among Hispanics in California: A Systematic  
Literature Review**

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**Abstract**

According to the Surgeon General of the United States, many Americans do not understand the importance of good dental hygiene, causing an overwhelming amount of disparities in oral health, especially in Hispanics. In general, Hispanics have the poorest dental hygiene care when compared to other racial and ethnic groups in the United States. Currently, there are little or no published research specifically on Hispanics living in California and their utilization of oral health services. The aim of this study is to conduct a systematic review of existing literature based on in-depth analysis of peer-reviewed published articles with a goal to review utilization of oral health care services by Hispanics living in California. The study reviewed how levels of educational attainment, levels of acculturation, levels of household incomes, gender, and age are associated with dental health utilization among California Hispanics. The results show that although California Hispanics require oral health services, limited resources such as finances, proper knowledge, and access to care makes this population at higher risk towards preventative oral care.

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## **Chapter One**

### **Introduction**

According to the United States Census Bureau (2011), the term Hispanics refers to those persons who are descendants from Mexico, Puerto Rico, Cuba, South or Central America, and other Spanish or Latino culture or origins. Data from the 2010 Census showed that there were 308.7 million people living in the United States, and of that number, 50.5 million, 16% were of Hispanic origin. There was an increase of 15.2 million Hispanics from the 2000 Census to the 2010 Census, and this represented a 43% population growth within a ten-year span. In California, Hispanics accounted for 14 million people, 28%, of the state's population; an increase of 27.8% since the 2000 Census was conducted. Additionally, the U.S. Census Bureau projects that Hispanics will account for 28% of the entire U.S. population by the year 2060. As a growing population with a history of health disparities, examining the existing research on Hispanics in Americans can offer insight on their status of oral health status.

A report in 2000 by the Surgeon General of the United States noted that many Americans do not understand the importance of good dental hygiene as well as the fact that oral health plays an integral role with a person's general health (United States Health and Human Services, 2000). A major goal of the Surgeon General is to improve the population's quality of life and advance the general health of all Americans through partnerships and programs that educate and promote oral health and prevent diseases. Good oral health is more than just healthy teeth. Published reports have shown strong

associations between oral infections and diabetes, osteoporosis, heart and lung conditions, and adverse pregnancy outcomes (Office of the Surgeon General, 2003).

It must be recognized that despite improvements in oral health for the general United States population, there are overwhelming disparities in oral health. According to studies published by Griffin *et al.* in 2014, children of color visit the dentist less often than the general population and only 35% of Hispanic children receive dental care compared to 50% of white, non-Hispanic children. According to a report from the Healthy People 2020, in 2015, an average rate of 33% of Hispanics had dental visits during the 12 months that preceded the study (Healthy People 2020). Great barriers for oral health disparities exist among Hispanics due to their socioeconomic status (SES), gender, age, and geographical location.

According to the Centers for Disease Control and Prevention (CDC), some of the oral health disparities that exists for the Hispanic population are untreated tooth decay in both adults and children and periodontitis disease in adults. In general Hispanics have the poorest dental hygiene care when compared to other racial and ethnic groups in the United States (CDC, 2016).

A major goal of the Healthy People 2020 is that CDC advocates for the elimination of oral health disparities through the implementation of various policy changes, programs, and strategies to educate the population. According to Health People 2020, the overall goal of the oral health objectives is to prevent and control oral and craniofacial diseases, improve conditions, prevent injuries and improve access to related services. These programs have targeted children and adults at schools, Women, Infant, and Children (WIC) recipients, people with diabetes or cancer, and vulnerable

populations to help educate on the importance of oral health (CDPH, 2018). Although only affecting a small Hispanic population, these programs have been proven to be successful. The programs typically reach out to individuals with children to better prepare the adults in taking care of their children's teeth, in part, also teaching the adults how to care for their own teeth.

As the growth rate of the Hispanic population continues to increase in the U.S., their oral health disparity when compared to other racial/ethnic groups will continue to persist as a public health issue if not adequately addressed. A primary goal of this capstone project is to review the literature on oral health disparities among Hispanics and summarize what has been learned to address this public health problem.

### Literature Review

In the United States, health disparities exist amongst every ethnic group and population (CDC, 2016); however, there is a need to study the health and healthcare determinants of Hispanics because of their rapid population growth rate (Mejia *et al.* 2008) and their poor outcome of oral health. Oral health care is important because prevalent oral diseases which affect the entire population are considered the “silent epidemic” but are often not given adequate priority (Allukian, 2011). Opportunities to inform the population on the importance of oral health have been targeted through organizations such as the American Dental Association (ADA), World Health Organization (WHO), and the CDC.

Health literacy is the ability to understand basic health information needed to make appropriate health care decisions. To those who emigrated, they come into the United States with limited knowledge of the English language and low levels of education, some without middle or high school educational levels (Zong and Batalova, 2015). In 2017, statistics of immigrants over the age of 25 from Mexico showed that 54% had less than high school degrees, 26% were high school graduates, 13% attended some college, and 7% have a bachelor's degree or more (Pew Research Center, 2019). Low health literacy holds a significant barrier to healthcare access and service utilization. Bacerra *et al.* (2017), examined the key determinants of low health literacy among immigrant Hispanic adults in California. The findings indicated that low health literacy was associated with limited English language proficiency (Odds Ratio, OR = 3.22). Findings from this study also reinforced the notion that living in poverty was associated with low health literacy (OR = 1.63) and lack of health insurance (OR = 1.40). The

results of the study demonstrated that language proficiency had limitations on health literacy.

A study was conducted by Bencosme (2016) to examine the impacts of demographic factors such as gender, age, and socioeconomic status on oral health. Gender is important in oral health because men and women have different dental care needs. Periodontal disease was seen to be higher in men than women (56.4% vs 38.4) and greatest among Hispanics and Non-Hispanic blacks due to women typically tending to their oral care more than men (Bencosme, 2016). Although rates of women having periodontal diseases were less than men, women had greater risks for dental caries than men (92.66% vs 90.57%). This finding was attributed to hormone fluctuations throughout different phases in life, such as puberty, pregnancies, and menopause. From Bencosme study, understanding the relationship between gender and age differences was effective in helping clinicians improve prevention and promotion of individuals' oral and overall health.

Hispanics represents the largest minority group with the fastest growth rate and has the lowest or second lowest rate for dental visits per year in all age groups, behind the African American and/or American Indian or Alaska Native groups, according to Dye *et al.* (2012). According to the CDC, data from 1997 to 2016 showed that dental visit rates for Hispanics were lowest or second lowest in all age groups in 1997, 2010, and 2016, which also supports Dye and colleagues' 2012 study (CDC, 2017). At all age groups in 2016, Hispanic have the lowest rate of dental visits that year with 63.55%, Whites with 71.45%, African Americans with 64.7%, American Indian and Alaska Natives with 64.6%, and Asians with 69.9%. Hispanic children are considered the highest with

untreated dental caries with an average of 19.1% compared to Non-Hispanic white with an average of 11.5%. A search through the CDC databases also indicates that Hispanic individuals have high percentages of untreated dental caries (CDC, 2017). For tooth retention among adults between the ages of 25-64, Hispanics (32.5%) were considered to have lagged behind Non-Hispanic whites (46.25) but fared better than Non-Hispanic Blacks (26.7%). For seniors over 75, Hispanics also have the highest prevalence of edentulous, toothlessness conditions, 28%.

A study conducted by Assari (2018) examined health effects of SES between Hispanic Whites and non-Hispanic Whites. The study examined whether Hispanic Whites had weaker health effects due to lower SES than other groups such as Blacks, a phenomenon known as Blacks' diminished return. The study used a nationally representative sample from the 2001-2003 Collaborative Psychiatric Epidemiology Surveys, which included 11,207 adults of which 7587 were Hispanic Whites and 3620 were non-Hispanic Whites. The study reported that having a higher SES was a protective factor against poor oral health; with non-Hispanic Whites having better privileges and advantages for better oral health than Hispanic Whites.

A study conducted by Kailembo (2018) examined whether two socioeconomic status measures, income and wealth, correlates in dental visits among adults in the U.S. The study used data sources from the 2011-2014 National Health and Nutrition Examination Survey (NHANES) and examined 9,246 participants, over the age of 20, within the Hispanic, non-Hispanic whites, non-Hispanic blacks, and Asian populations. The study found that among the participants, Hispanics had the highest percentage, 53.9%, of not having a dental visit, followed by non-Hispanic blacks, 49.2%, Asians,

38.2%, and non-Hispanic whites, 34.0%. The results were interpreted using a Prevalence ratios (RR) model, the ratio of the proportion of the persons with disease over the proportion with the exposure. The results found that non-Hispanic white had an RR equal to 1.0 while Hispanics had an RR of 1.58, non-Hispanic blacks had an RR of 1.45, and Asians had an RR of 1.13 (Kailembo *et al.*, 2018). The study concluded that individuals living in lower socioeconomic positions were significantly more likely to not have a dentist visit, with Hispanic individuals being the most vulnerable compared to non-Hispanic whites.

Individuals living in a low socioeconomic status do not have the greatest health insurance, let alone have oral health insurance coverages. A report for the U.S. Census Bureau done by Barnett and Vornovitsky (2016) examined the health insurance coverage in the United States in 2015 between races and household income levels. The report states that people living with lower household incomes had lower health insurance coverage rates. In 2015, 85.2% of people with an annual household income less than \$25,000 had health insurance coverage, compared with 92.7% of people with a household income above \$75,000 (Barnett and Vornovitsky, 2016). The report also found that in 2015, non-Hispanic whites had the highest rate of health insurance coverage with 93.3% coverage, Asians were second with 92.5% coverage, then non-Hispanic blacks with 88.9% coverage, and lastly Hispanics with the lowest with 83.8% (Barnett and Vornovitsky, 2016). Because higher rates of Hispanics live below the poverty threshold, it is too costly for individuals to receive the health care coverage they need for preventative services such as oral health services.

Acculturation is a process on how an individual has integrated into another country's culture and language. Hispanics who have lived in the United States for a longer amount of time are likely to have become more accustomed to the American lifestyle compared to those who have recently emigrated from their countries. Language is a common indicator in determining an individual's acculturation level. A study by Cristancho et al. (2014) surveyed 894 adult Hispanics within six rural communities in Illinois to investigate whether length of residency affected how Hispanics in the United States received health information. The study found that first generation Spanish speakers attended less preventive health screenings than second generation Hispanics (Cristancho S. *et al.* (2014). Another study conducted by Tam et al. (2015) assessed adult patients' ability to read and understand information on health literacy. The study found that low literacy in English was associated with low health literacy leading to poorer health status, less preventive services, and less knowledge about disease management (Tam *et al.* 2015).

Several factors known to impact oral health also contribute to the process of acculturation for the Hispanic community. An individual's lifestyle behaviors and beliefs can positively or negatively influence the use of prevention and treatment services. A study conducted by Garcia *et al.* (2017) examined the impact of acculturation on periodontal health among Hispanic adults in the United States. The study identified two indicators for determining acculturation: an individual's preferred language and an individual's nativity status. Garcia et al. found that language was a significant Hispanic acculturation indicator and that 65.9% of Spanish speakers had periodontist when compared to 34.1% of English speakers. Additionally, the study showed that with

nativity, 31.9% of U.S.-born citizens had periodontist when compared to 16.0% of foreign-born U.S. citizens and 52.1% of foreign-born non-U.S. citizens. This is especially important among the Hispanic population because according to the United States Census Bureau (2014), 74.3% of Hispanics living in the United States speak Spanish at home; which suggests that Hispanic American children might not be getting enough English language training at home.

A study by Sentell and Braun (2012) used data from the 2007 California Health Interview Study (CHIS) and compared health status based on low health literacy and limited-English proficiency among populations of Hispanics, Chinese, Korean, Vietnamese, and Whites. With a sample of 5,724 Latino, the study found that 37.3% were categorized in the Limited English Proficiency group out of which 44.5% were considered low health literacy and 42.4% with adequate health literacy. The study concluded that those with limited English proficiency and low health literacy had higher risk for developing poor health with greater health status risks.

With the ever-increasing population of Hispanics in California, oral health disparities are a persistent concern among this population. The CDC reported that overall, Hispanics, non-Hispanic blacks, and American Indians or Native Americans have the poorest oral health of any racial and ethnic groups in the United States (CDC, 2016). When comparing Hispanics with other ethnic groups such as American Indian or Alaska Native, African Americans, Asians, and Whites; Hispanics do not visit the dental offices as much per year and have high rates of dental caries.

Another factor associated with oral health is educational achievement. In the same CDC findings, the statistics showed that Adults aged 35-44 years with less than a

high school education experience three times as much of untreated tooth decay compared to those with some college education. This finding is considerable when considering that 47.2% of U.S. adults have some form of periodontal diseases. Moreover, as the population ages, we can expect an even higher frequency. The CDC reports that 70.1% of adults aged 65 and older have periodontal disease.

There is an urgent need to educate the Hispanic population on oral health care. Understanding of how Hispanics utilize oral health services will allow for culturally-targeted educational programs designed to bring about social change among Hispanics in California. In order to evaluate how Hispanics care for their oral health, there needs to be an assessment of how Hispanics are utilizing programs taught at dental clinics, programs funded by the state of California, research funded programs, and programs from schools K-12, and to analyze which oral health services are being utilized.

To achieve goals of educating Hispanics and other ethnic groups on oral health, California's Department of Public Health developed the Office of Oral Health to improve the oral health of all Californians through oral health education programs to teach prevention, education, and organization community efforts. The state intends to identify short term and long-term goals and objectives to address the burden of oral health diseases and to increase access to oral health services for high risk populations. For certain cities, such as Orange County, created oral health organizations to improve access to dental care and preventing dental diseases for their communities. The city organizations all have similar goals as the state of California's, to create oral health educational programs to better address and educate populations for better utilization of dental services and awareness of one's oral health.

Currently, there are little or no published research articles specifically on Hispanics living in California and their utilization of oral health services. Because there is limited previously published research on this population, the main goal of this study was to review available literature on the utilization of oral health services among Hispanics in California.

### **Study Overview**

There is little research and published data on the utilization of oral health care services among California Hispanics, hence the purpose of this capstone project aims to conduct a systematic literature review on the utilization of oral healthcare services among Hispanics in California through a systematic literature review, focusing on the following factors: educational attainment, acculturation, gender, age, and household income.

The main objective of this study is to conduct a systematic review of existing literature based on in-depth analysis of peer-reviewed published articles. The overall goal of the study was to review utilization of oral health care services by Hispanics living in California. The specific aims are as follows:

**Aim 1:** To examine how the level of educational attainment is associated with dental health utilization among California Hispanics

**Aim 2:** To examine how level of acculturation is associated with dental health utilization among California Hispanics.

**Aim 3:** To examine how gender is associated with dental health utilization among California Hispanics.

**Aim 4:** To examine how age is associated with dental health utilization among California Hispanics.

**Aim 5:** To examine how household income is related to oral health utilization among California Hispanics.

## Chapter Two

### Methods

#### Study Design

The purpose of this capstone project was to conduct a systematic literature review to summarize the utilization of oral health care services among Hispanics in California. The descriptive statistical variables that were observed throughout the articles were educational attainment, primary language spoken, gender, age, and household income. This systematic literature review relied on peer-reviewed published articles found on scholarly sources such as Google Scholars, OneSearch, ProQuest, and PubMed.

#### Search Strategy

The key search words and phrases in this study were oral health, promotion, utilization, California, and Hispanics. Sources of all articles included in the study were from peer-reviewed publications and publicly available data from the CDC.

#### Inclusion and Exclusion Criteria

This study focuses on a review of available literature on Hispanics in California seeking oral health information. Only peer-reviewed articles limited to the English language were included in this review. All peer-reviewed articles that included oral and/or dental health promotions and utilization by Hispanics living in California were included. The peer-reviewed articles must have been published within ten years prior to this study and included all studies from 2009 to 2019. Articles from PubMed and ProQuest with the options of "Full Text" or "Free Full Text" were included.

The PRISMA Flowchart shown in **Figure 1** depicts the hierarchy of the search process. The initial database search provided a total of 6,124 articles. Duplicate articles were identified and removed, and these were subsequently screened based on their titles

and abstracts to determine inclusivity and whether they were applicable to this study. Lastly, the articles were screened to ascertain if they met the inclusion and exclusion criteria as well as full-text eligibility criteria. All articles with complete data were included in the study.

### **Data Analysis**

The articles included in the study were grouped based on common themes and similarities. The themes included descriptive statistical variables employed in the analysis of each study. The categories of recurring themes were grouped as follows:

1. Educational Attainment
2. Acculturation
3. Gender
4. Age
5. Household Income.

Education attainment refers to the highest level of education that an individual has completed. Data on the level of education included questions such as “what is the highest grade of school, or highest degree received?”

Acculturation is a process experienced by immigrants, individuals who left their home country seeking to live permanently in a new country, finding themselves in an area with new customs, new language, and new ways of living. Data on an individual's acculturation was observed through the length of how long they have lived in the United States. Studies assessed acculturation through the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II), years of living in the United States, or if participants were born in Mexico or United States. The ARSMA-II scale consisted of two

subscales: Anglo Orientation and Mexican Orientation and generates scores on how often the individual thought, read, wrote, or spoke English or Spanish. Scores were independent of one another. Individuals were given positive scores if they preferred English while those who preferred Spanish received negative scores.

Gender is an important variable to examine among the Hispanic population. Understanding the population's gender provided insights into changing the group's condition and future health trends. We know that women tend to be more attentive to health conditions (Hunt *et al.*, 2011), so examining gender is an important factor necessary for this study.

Age is also an important variable to examine among the Hispanic population. Understanding the population's age provides insight into knowing when the population needs the most care. We know that the aging process generates more oral health concerns (American Dental Association, 2019), so examining age is an important factor necessary for this study.

Household income refers to income received on a regular basis, before taxes, social security, and medical deductions. Income is an important factor behind health disparities that many minorities often experience. Because many California Hispanics qualify as low income and in a health care system where dental health is not usually covered by insurance, this factor was included in the study.

## Chapter Three

### Results

In this study, a systematic literature review was conducted to explore the utilization of oral health services among Hispanics in California. The review of available literature and database searches occurred during the months of June and July 2019 using keywords for appropriate terms. The scholarly online databases used for the study included Google Scholar, PubMed, OneSearch, and ProQuest.

The results of literature searches from the selected databases yielded a total of 6,124 journal articles that were relevant studies for the topic. Studies that were found to be duplicates ( $n=12$ ) were excluded. The remaining 6,112 studies were then screened by their title, abstract, and the availability of retrievable full text articles. Of the 6,112 studies, 6,049 excluded for not meeting the inclusion criteria. The remaining 63 studies were further reviewed, and 54 studies were excluded for not meeting additional inclusive criteria (i.e., the study must have been conducted in California and reported in English language). The remaining studies ( $n=9$ ) shown in **Table 1** below, were selected for the final review for this study to be evaluated because the studies met the inclusion and exclusion criteria.

**Table 1 (also in Appendix II):** Provides a summary breakdown of the databases that yielded the final selection of studies. These included Google Scholar (7 studies) and PubMed (2 studies).

| Year | Authors              | Title   | Objective   | Results  | Conclusions  |
|------|----------------------|---|---|--|--|
| 2018 | Chang, <i>et al.</i> | Importance of content and format of oral health instruction to low-income Mexican immigrant parents: A qualitative study  | <p>1) To determine the content and format of the oral health instruction parents recall receiving</p> <p>2) To understand how low-income Spanish-speaking Mexican immigrant parents feel the content and format of oral health instructions</p> <p>3) To understand how these parents see their role in caring for their children's teeth</p> | 25/30 parents recalled receiving oral hygiene instructions with the format and effectiveness of instructions varying. More engaging educational approaches were recalled and described in more detail than less engaging education approaches.   | Most parents recalled receiving oral hygiene and nutrition instruction as part of their child's dental visit and reported incorporating the instructions into their children's home routine. |
| 2015 | Hoelt, <i>et al.</i> | Using community participation to assess acceptability of "Contra Caries", a theory-based, <i>promotora</i> -led oral health education program for rural Latino parents: a mixed methods study | To describe the qualitative findings of the acceptability of curriculum content and activities, presents the process of refinement of the curriculum through engaging the target population and <i>promotoras</i> , and presents results of the acceptability of the curriculum once implemented.   | 12 focus groups were conducted with 105 parents. Attendance and retention were high (89% and 90% respectively). The study found that parents were not only interested in, but attended classes focused on increasing their knowledge and skills. The <i>Contra Caries</i> content and format were found as acceptable. | The <i>Contra Caries</i> Oral Health Education Program was acceptable to low-income, Spanish-speaking parents of children 1-5 years.   |

**Table 1 – Cont.**

| Year | Authors                  | Title  | Objective   | Results  | Conclusions   |
|------|--------------------------|--|---|--|---|
| 2018 | Finlayson, <i>et al.</i> | Child, caregiver, and family factors associated with child dental utilization among Mexican migrant families in California | To identify factors related to dental utilization in the past year among children in Mexican migrant families, accounting for understudied psychosocial caregiver and family factors                    | 76% of children had visited the dentist in the past year while 8.6% had never visited. Gender and insurance played factors for the children, while education and depressive symptoms played as factors for caregivers. Uninsured children were less likely to have a past dental visit compared to insured children (OR= 0.23, CI= 1.36-13.61). Higher caregiver education was positively associated with child dental utilization (OR= 4.50, CI= 1.50-13.55). | Child age and dental insurance, and caregiver education and dental utilization history were associated with whether a child had a past year dental visit.   |
| 2010 | Finlayson, <i>et al.</i> | Dental utilization among Hispanic adults in agricultural worker families in California's Central Valley                    | To examine a range of predisposing, enabling, and need factors associated with past year dental visits in agricultural adult group using data collected from California's agricultural worker families. | 34% of adults had a past year dental visit, despite 44% reporting a regular dental care source. 66% lacked dental insurance, and 46% had untreated caries. 86% perceived having current need for care.   | Access to care has historically been difficult for this population in California. Common barriers of a lack of time, money, transportation, ability to take time off from work, basic oral health knowledge, perceived need, and dental providers have persisted. |

**Table 1 - Cont.**

| Year | Authors                  | Title   | Objective   | Results   | Conclusions  |
|------|--------------------------|---|---|---|--|
| 2010 | Swan, <i>et al.</i>      | Rural Latino farmworker fathers' understanding of children's oral hygiene practices                           | To examine rural Latino farmworker fathers' understanding of their children's oral hygiene practices.   | Fathers had very little understanding of the etiology and clinical signs of dental caries. 18 of 19 fathers reported that their wife was primary care for children's hygiene. Fathers describes very minimal hygiene assistance given to children by either parent. Fathers generally thought a child did not need supervision after age 4.   | Rural Latino fathers might not actively participate in their children's oral hygiene, but they do place a value on it. Men are supportive of dental treatment, although later than recommended.              |
| 2011 | Hoeft, <i>et al.</i>     | Maternal Beliefs and Motivations for First Dental Visit by Low-Income Mexican-American Children in California | To examine the meanings and practices of parents around first dental visits for their children.   | 51% of first dental visits were for parent-initiated reasons, pain or visual dental problems. 49% were initiated by external prompts, recommendations from school. Once a child went to the dentist, 94% continued for regular checkups. Mean age for first dental visits were 3.   | These low-income, urban Mexican-American parents are taking their children to their first dental visit around 3 years of age, later than recommended.  |
| 2014 | Finlayson, <i>et al.</i> | Dental utilization by children in Hispanic agricultural worker families in California                         | To investigate predisposing, enabling, and need factors associated with children's past year dental utilization among Hispanic agricultural worker families in central California | 51% of children had a past year dental visit, 23% had never been to a dentist. Children were less likely to have a past year dental visit if they were foreign-born, male, had caregivers that thought they had cavities or were uninsured. Children aged 6-12, with a regular dental care source, and whose caregivers had a recent visit were more likely to have a past year dental visit. | Children were more likely to have a past year dental visit if they had a usual source of dental care (OR= 4.78, CI= 2.51-9.08), and if the caregiver had a past year dental visit (OR= 1.88, CI= 1.04-3.38). |

**Table 1 – Cont.**

| Year | Authors              | Title  | Objective  | Results   | Conclusions   |
|------|----------------------|--|--|---|---|
| 2009 | Hoeft, <i>et al.</i> | Mexican-American mothers' initiation and understanding of home oral hygiene for young children               | To investigate caregiver beliefs and behaviors as key issues in the initiation of home oral hygiene routines   | Average age of tooth brushing initiation was 1.8 years; only 13% of parents initiated oral hygiene in accord with the American Dental Association (ADA) recommendations. 48% of children's' mothers were prompted with pediatrician and social service professionals. | 87% of the urban Mexican-American mothers in the study do not initiate oral hygiene practices in compliance with ADA recommendations.   |
| 2009 | Horton and Barker    | Rural Mexican Immigrant Parents' Interpretation of Children's Dental Symptoms and Decision to Seek Treatment | To understand low-income rural Mexican immigrant parents' decision-making process, how they define oral disease, and interpret their children's oral symptoms. | Most caregivers deduced the health of teeth from visible appearance. Caregivers often delayed treatment because they viewed their children's oral disease as mere "stains" requiring cleaning rather than as bacterial infections.                                    | Even when Mexican immigrant caregivers recognize a dental problem, they often misinterpret it as a "stain." Interpretations of decay were shaped by the caregivers' lack of experience with children's decay in rural Mexico. |

## Categories and Grouping of Themes

For this literature review, the nine peer-reviewed studies were categorized and evaluated based on their similarities among the five aims of this project. The five categories focused on the California Hispanic population and the barriers that impact their access to utilize oral health services.

### 1. Educational Attainment

Six of the nine studies were evaluated based on the participants' educational attainment and the results are summarized in **Table 2**. From the six studies that evaluated educational attainment among California Hispanics, five studies found that educational attainment was associated with utilization of oral health services in the group participants observed and one study found that educational attainment had little influence on utilization of oral health services in the group of participants observed. The five studies that found an association among the group participants observed were Chang et al. (2018), Hoeft et al. (2015), Hoeft et al. (2011), Hoeft et al. (2009), and Horton and Baker (2009). However, the one study that did not find an association among the group participants observed was (Swan et al. (2010).

The results showed that 5 of these studies provided information on the mean and standard deviation for the participants' years of education while the remaining one study provided additional categories of years in school such as "6 years or less," "7-11 years," "high school diploma," and "more than high school." Participants in the studies from Chang et al. (2018), Swan et al. (2010), Hoeft et al. (2011), Hoeft et al. (2009), and Horton and Baker (2009) (n= 169) reported a low level of educational attainment when the number of participants' years of education were summed and divided it by the

number of studies; the participants received an average of  $7.98 \pm 1.47$  years of schooling. Participants in the study from Hoeft et al. (2015) ( $n= 105$ ) reported a different range of education; 33% of participants reported 6 years or less of school, 17% reported attending 7-11 years, 31% reported receiving a high school diploma, and 18% reported achieving more than high school. Participants from Hoeft et al. (2015) reported the longest average years of schooling, 12 years. Participants from Swan et al. (2010) reported the shortest average years of schooling, 5.5 years.

## 2. Acculturation

Six of the nine studies were reviewed for their evaluation of the participants' level of acculturation and the results are summarized in **Table 3**. From the six studies that evaluated levels of acculturation among Hispanics, five found that acculturation was associated with utilization of oral health services and one did not find an association. The five studies that found an association were Finlayson et al. (2010), Finlayson et al. (2018), Horton and Baker (2009), Hoeft et al. (2009), and Chang et al. (2018). The one study that did not find an association was Swan et al. (2010).

The acculturation levels of participants in the studies were measured with two different methods that documented the number of years that the participants had lived in the United States and a final assessment with ARSMA-II. Participants from Horton and Baker (2009), Hoeft et al. (2009), Swan et al. (2010), and Chang et al. (2018) ( $n= 121$ ) had their acculturation levels measured through the participants' "Years Living in the U.S." The participants had an average of  $12.8 \pm 2.51$  years living in the United States when the participants' number of years living in the U.S. were summed and divided it by the number of studies. Participants from Finlayson et al. (2010) and Finlayson et al.

(2018) (n= 468) had their acculturation levels measured through the assessment of ARSMA-II, a scale consisting of two subscales: Anglo Orientation and Mexican Orientation and generates scores on how often the individual thought, read, wrote, or spoke English or Spanish. The calculated results received an average score of  $-3.05 \pm 0.36$  when the participants' ARSMA-II score were summed and divided it by the number of studies, signifying that the participants were more Mexican oriented. Participants from Horton and Baker (2009) (n= 26) reported the least amount of average years living in the United States, 8.5 years. Participants from Chang et al. (2018) (n= 27) reported an average of 15 years and this represented the longest number of years living in the United States. However, the ARSMA-II study (n= 142) received a negative score of -3.05.

### 3. Gender

Results from the selected nine studies (n= 1414) documented the gender of each participant. and this is summarized in **Table 4**. Between the nine studies, utilization of oral health services for adult Hispanic female participants were dominant over adult male participants and were fairly equal between female and male for children. The studies that reported adult gender was from Finlayson et al. (2010), Horton and Baker (2009), Hoefl et al. (2009), Swan et al. (2010), Chang et al. (2018), Hoefl et al. (2015), and Hoefl et al. (2011). From those studies (n= 696), it was reported that 78.4% of those who participated were females. The studies that reported children gender were from Finlayson et al. (2018), Hoefl et al. (2009), Chang et al. (2018), Hoefl et al. (2015), and Finlayson et al. (2014). Participants from those studies (n= 809) reported that 48.8% of those who participates were female.

### 4. Age

Results from the selected nine studies (n=1414) documented the age of each participant, and this is summarized in **Table 5**. Between the nine studies, oral health care services were utilized mainly by young Hispanic adults within ages 18 to 44 as well as young children. The studies that reported adult ages were from Finlayson et al. (2010), Horton and Baker (2009), Hoeft et al. (2009), Swan et al. (2010), Chang et al. (2018), Hoeft et al. (2015), and Hoeft et al. (2011). (2012). Participants from those studies (n=879) reported an average age of  $33.7 \pm 2.79$  when the average age reported by participants from each article were summed and divided it by the number of articles. The studies that reported children ages were from Horton and Barker (2009), Hoeft et al. (2009), Swan et al. (2010), Chang et al. (2018), Hoeft et al. (2015), Finlayson et al. (2014). Participants from those studies (n= 887) reported an average age of  $5.22 \pm 2.46$  when the average age reported by participants from each article were summed and divided it by the number of articles. Only one study, Finlayson et al. (2018), reported children ages categorically; children ages 0-5 years were 26.8%, 6-11 years were 45.8%, and 12-17 years were 27.5%.

## 5. Household Income

Nine of the nine studies documented the participants' household incomes, and these are summarized in **Table 6**. Between the nine studies, it was found that all participants (n=1066) were considered part of the low household income bracket. The nine studies also found an association between low household income among California Hispanic individuals and families with utilization of oral health care services, many stating that low income is a causing factor towards a barrier in utilizing oral health care services.

The studies that reported household income with an average annual income were Hoeft et al. (2011), Hoeft et al. (2015), Swan et al. (2010), Hoeft et al. (2009), and Horton and Barker (2009). These studies (n=193) reported an average of  $\$21,720 \pm 3,110.24$  annual household income when the average annual household income reported by participants in each article were summed and divided by the number of articles. Two studies, Finlayson et al. (2014) and Finlayson et al. (2010) reported the participants' (n=731) annual household income in three categories: \$10,000 or less, \$10,000-\$19,999, and \$20,000 or more. In those studies, 257 participants reported an annual household income of \$10,000 or less, 305 participants reported an annual household income of \$10,000-\$19,999, 169 participants reported an annual household income of \$20,000 or more. One study, Finlayson et al. (2018), reported the participants' (n= 142) monthly household income into two categories:  $\leq \$1,499$  and  $\geq \$1,500$ . In this study, 77 participants reported a monthly household income of  $\leq \$1,499$  while 65 participants reported a monthly household income of  $\geq \$1,500$ . Results of household incomes from all nine studies indicate that these participants' levels of incomes all fit below the U.S. poverty threshold for an average family of four in 2018, which was \$25,465 (US Census 2018).

## **6. Oral Health**

The nine studies were systematically reviewed for commonality among the topic of oral health. Three studies done by Finlayson in 2010, 2014, and 2018 had statistical data of participants on "Dental Visits in the Past Year". In Finlayson (2010), 34% of adults had a past year dental visit while 44% reporting that they have a regular dental care source. In Finlayson 2014 and 2018, 63.5% of children had a dental visit in the past year.

These studies showed that the frequency of dental visits among California Hispanics have increased in the past 20 years.

Four studies done by Hoelt (2009), Hoelt (2011), Swan (2010), and Horton (2009) reviewed the parents understanding of oral care for their children. In the four studies, parents believed that the best ages to take their children to the dentist are between 2 – 4, unless a visible problem or pain occurs. In Hoelt (2011) and Hoelt (2009), 49.5% of Hispanic parents did not initiate going to the dentist until an external prompt such as a pediatrician, social service professional, or school recommends the parents to take their child to the dentist.

## Chapter Four

### Discussion

Although the frequency of dental visits has increased in the Hispanic community within the past 20 years, from 25% to 34% (CDC, 2005), there is still a large population of Hispanics not utilizing oral health services. This is due to various barriers of access to care, finances, proper knowledge, and time on when to seek for care, it makes this population more vulnerable for dental care. This systematic review found that Hispanic participants in California who seeks out oral health care services tend to have lower levels of educational attainment, be more negative within the acculturation scale and with less years living in the United States, be females in their 30's, and categorized among households with low incomes.

A low level of educational attainment leads to incorrect information and knowledge on when to seek care. Acculturation makes it difficult to communicate with providers, leading Hispanics to feel a disconnect and barrier. A study done by Duncan et al. 2006 reported that 88.5% of foreign-born men work, while 56.1% of foreign-born women work (Duncan *et al.*, 2006), leaving women with more time to seek care for themselves and their children while men work to provide for their family. The aging process is different for all ethnic groups due to different health care barriers (Andersen and Davidson, 1997), so examining aging in Hispanics help with better understanding of their oral health needs. Lastly, low household incomes make it a financial barrier to seek for care since the individuals would not have the proper finances to pay for dental services.

## 1. Educational Attainment

Having higher levels of educational attainment is associated with a greater ability to understand the basic information about health. According to the Pew Research Center, in 1996, data showed that Hispanics had the highest high school dropout rate (34%) compared to blacks (16%), whites (10%), and Asians (5%) (Pew Research Center, 2017). However, recent data from 2016 has shown a new and improving trend that Hispanics have closed the gap tremendously with only a 10% high school dropout rate compared to blacks (7%), whites (5%), and Asians (3%). What was found from these combined studies of participants was that the average number of educational years was 7.98 years of school, representing an education level of 7<sup>th</sup> grade completion or being aged 12. When an individual has a shorter term of education, they will find more difficulty understanding the health care system and how to manage their personal health issues due to inadequate health literacy (Lee *et al.* 2010). Having a higher level of health literacy allows individuals to process and understand health information and services needed to make appropriate health decisions. Having a lower level of health literacy is a risk factor in itself for individuals because they are less knowledgeable about diseases and less capable of properly caring for themselves (Cho *et al.* 2008).

Because the participants in the nine studies that were reviewed have lower than average years of schooling, they are left to be more vulnerable to caring and understanding their oral health needs. For example, in one of the studies, Horton's (2009), caregivers generally viewed teeth "stains" as discoloration, unaware that those are bacterial infections that requires treatment. One mother believed that brushing the child's teeth more could remove the brown stains. While another father brought his child

to a dental visit for a teeth cleaning, when in actuality the child ended up needing more extensive treatment for caries. These are small examples of how lower levels of education will put a population at risk for proper timing of when to seek care.

A study done from Kim et al. (2012) has found that an individual's general and oral health is correlated to their level of education. It was found that persons with low levels of education experienced more oral health problems at younger ages, and that the disparities are more noticeable at older ages (Kim *et al.*, 2012). Findings from this study suggest a similar conclusion that an individual's level of education correlates with their oral health.

## **2. Acculturation**

Being acculturated to another country besides an individual's home country allows an individual to be more comfortable in the language and culture of the current country where they are living. The results of the studies suggested that the participants within these studies tended to be more Mexican-oriented, rather than Anglo-oriented. The findings were indicated through the application of the ARSMA-II scale or calculating the years of living in the United States as reported by the participants. With studies focusing on "Years living in the United States", the average of 12.8 years of being in the United States is still a short amount of time. Due to a lower amount of time living in another country, apart from an individual's birth country, it would require the individuals a significantly longer amount of time to understand a foreign culture and language.

Language preference between Spanish and English has been associated with health behaviors, disease prevalence, and utilization of health care services among Hispanics (DuBard *et al.* 2008). Dubard's study found that Spanish speaking Hispanics

had far worse access to health care than English speaking Hispanics. That study found that 45% of Spanish-speaking Hispanics were less likely to have annual preventative checkups compared to 36% of English-speaking Hispanics, resulting in poorer access to care and ultimately being more disease prevalence. The preference for Spanish marks a particularly vulnerable subpopulation of U.S. Hispanics who have less access to care and use of preventive services.

A significant number of Hispanics face language barriers when seeking dental care. Language becomes critical when Spanish-speaking patients encounter providers who do not speak Spanish and with no interpreters available. Patient-provider communication is most important when it comes to the process within health care; poor communication due to language barriers leads to inappropriate diagnosis testing when patients attempt to explain their problems (Morales *et al.* 2002). For example, in Hoelt (2015) study the focus was on a program called *Contra Caries* Oral Health Education Program for Spanish speaking parents that taught parents how to properly take care of their child's oral health. The study was taught by fellow Spanish speaking individuals, called *promotoras*, because participants in focus groups preferred to be taught by Spanish speakers because they are more comfortable when communicating and expressing their similar cultures and beliefs amongst one another.

Although the effect of acculturation on Hispanic health is complex and not very well understood yet; studies have recognized that acculturation does have a relationship with an individual's general and oral health (Lara *et al.*, 2005). Findings from this study also suggest that there is a relationship between acculturation and an individual's oral health.

A common theme from the relevant studies on the relationship between acculturation and oral health among California Hispanics can be summarized that the Hispanics who are least accustomed to the U.S. culture have the most barriers in receiving oral health services. California Hispanics who do not understand English well enough will not have as much dental care compared to those who are more acculturated to the U.S. culture due to the language barriers.

### **3. Gender**

For gender, some of the studies examined both adults and children, while some only reported adults and/or child, therefore gender was reported for both groups only when available. Gender differences in health and use of health services are a concern within the United States health care system. The results of this study showed that 51.2% adult participants were female. This is a concern because men do not seek health care as readily as women do and this is reflected in the literature. A study done by Hunt et al. (2011) has observed that women make higher use of seeking medical and dental care than men do. Women typically seek consultation from providers for common symptoms and are less reluctant to visit providers compared to men (Hunt *et al.* 2011).

Not only are men more reluctant to visit providers; men who are head of low-income immigrant households are required to work more to provide for their families while wives take care of the children at home. The concern for men needing to work long hours to provide for their families in a low-income environment effects their time outside of work to schedule health visits. As an example of gender difference, in Swan (2010) study focused on how male Hispanic farmworker understand their role in the family and their responsibility in supporting their children with oral hygiene. The fathers believed

that their responsibilities were to work and provide food for their families as first priority and their health as second.

#### 4. Age

For age, some of the studies examined both parents and children, while some only reported adults and/or child, therefore age was reported for both groups only when available. Examining how the different age brackets among the Hispanic population utilizes oral health services provides us understanding of when the population seeks for care. The results of this study observed that the adults' average age was  $33.7 \pm 2.79$  years old and the children's' average age was  $5.22 \pm 2.46$  years old.

When examining for age, 4 articles observed only adult ages, 2 studies observed only children ages, and 4 studies observed both adults and children ages. A common question asked amongst the studies that were evaluated was when parents believed were the best ages to utilize oral health services for their children. This study found that the common answer between participants was anywhere between the ages of 2 – 4 or whenever a visual problem or pain occurs; which is much later than the recommended age of six months or after the baby's first tooth (American Dental Association, 2013). This is a concern for the Hispanic population because of the barriers to understand of when to utilize oral health services. In a study done by Barker and Horton (2008), it was found that 72% of Hispanic children ages 0 to 8 have dental caries. It was also found that 16.7% of Hispanic children ages 2 – 17 had never seen a dentist (Barker and Horton, 2008).

When looking at rates of dental visits published in 2016 by the CDC for the Hispanic populations, all age groups within the population had low rates of dental visits that year. In the report, the CDC published that Hispanics ages 2 years and over had a dental visit rate of 63.4%, ages 2 – 17 had a dental visit rate of 83.7%, ages 18-64 had a dental visit rate of 55.3%, and ages 65 and over had a dental visit rate of 51.8% (CDC, 2017). A common theme from relevant studies on the relationship between age and utilization of oral health services among Hispanics of all ages have the lowest dental utilization rate of all ethnic groups.

### **5. Household Income**

Research has observed that people with lower income and lower levels of education have worst health behaviors and health care compared to people with higher income (Dubay & Lebrun 2012). In this study, the results we saw in the average household income of the participants was \$21,720; an average lower than the United States' poverty threshold for an average family of four in 2018, \$25,465 (US Census 2018). In general, income inequalities affect minorities groups more than income inequalities for the white population, leading to financial barriers for proper access to care.

Eight of nine studies that were observed documented the average amount of household incomes for the participants. Overall, because the articles observed in this review were tailored towards Hispanic who were migrants and farmworkers, all participants were considered in the low-income bracket. Being a part of the low-income bracket, this population is more vulnerable to preventable and treatable dental disparities. Because the participants in these studies are living under the U.S. poverty threshold, these

individuals have less access to health services because of their limited income and must prioritize how their money is spent. Dental health, while important, is not prioritized for these individuals struggling to meet their everyday needs.

Research has shown that SES is associated with an array of health disparities, not just in oral health. Economic resources such as employment and income are essential for maintaining health. Individuals living in higher SES reduces their exposures to risk factors from chronic diseases through preventative health checkups (Assari, 2018). SES is a protective indicator against poor general health and oral health in all ethnic groups' health disparities and should not be overlooked.

## **6. Strengths and Limitation**

The studies all recognized that there is a need for better access and promotion of oral health for the Hispanic population in California about their utilization on oral health services. The studies were able to identify that low-income Hispanics needed to better access on oral health services to care for themselves and for their children's oral health. Many studies showed to have positive results on the utilization of oral health services and that the Hispanic population do utilize oral health services, but only when everyday life permit them to. Another strength in this study is that within the articles studied, there was a wide range of backgrounds within the Hispanic population; from immigrants, to second generation individuals and from living in Southern California to central to Northern California.

Limitations within this study were due to the lack of an age range. Many studies focused on utilization for children and their parents; therefore, the studies did not look into the elderly Hispanic populations. This limitation could have potentially caused a

skew in the results since elderly people might have an even lower education level, be less acculturated to the American lifestyle, possibility of no incomes due to being older and less capable of the physical demands of work and changing the age ranges in this study.

### **Conclusion**

This research study suggests that Hispanics face many oral health disparities. Literature has shown that Hispanics are more likely to have the poorest dental care when compared to other racial and ethnic groups in the United States. This study sought to conduct a systematic review of existing literatures with a goal to review utilization of oral health care services by Hispanics living in California. From review of the published articles, this study found that California Hispanics do seek oral health services when symptoms are in the later stages. These results occur due to limited resources such as finances, proper knowledge, and access to care for these individuals.

### **Implications for Public Health**

California Hispanic populations suffer from oral health disparities. The findings from this study suggests that barriers to utilize oral health services for California Hispanics continue, although the gap seems to be slowing, barriers persists for this population. Low education, low income, and little understanding of English are determinants that is associated with poor oral health outcomes for Hispanics. Further studies will help improve areas for better oral health utilization and knowledge for this population; with lawmakers potentially creating policies that will support early screenings, in-school oral education programs, and programs that targets to educate vulnerable communities in oral health services. With the Hispanic group continuing to

increase in the United States, it is important to understand the risk factors that prevents this population from utilizing oral health services.

## Chapter Five

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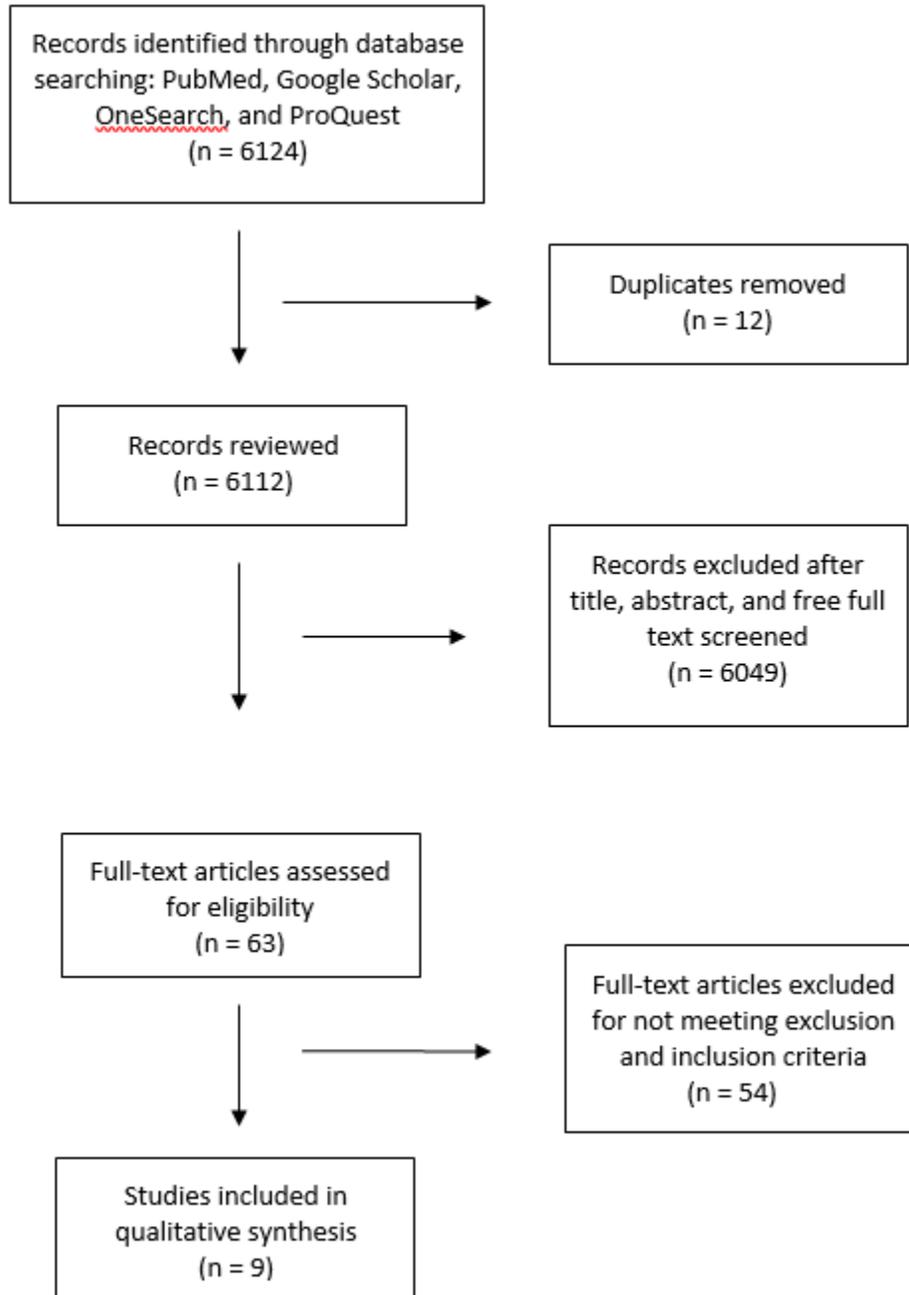
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## Appendix I

**Figure 1:** Flowchart of study selection as adapted from PRISMA protocol, Moher D *et al.* (2009).



### Summary of Flowchart

1. Records identified through database searching: PubMed, Google Scholar, OneSearch, and ProQuest (n = 6124)
  - a. Duplicates removed (n = 12)

2. Records reviewed (n = 6112)
  - a. Records excluded after title, abstract, and free full text screened (n = 6049)
3. Full-text articles assessed for eligibility (n = 63)
  - a. Full-text articles excluded for not meeting exclusion and inclusion criteria (n = 54)
4. Studies included in qualitative synthesis (n = 9)

## Appendix II

**Table 1:** Overview of included studies (n= 9) with their objectives, results, and conclusions.

| Year | Authors              | Title   | Objective  | Results  | Conclusions  |
|------|----------------------|---|--|--|--|
| 2018 | Chang, <i>et al.</i> | Importance of content and format of oral health instruction to low-income Mexican immigrant parents: A qualitative study  | <ol style="list-style-type: none"> <li>1) To determine the content and format of the oral health instruction parents recall receiving</li> <li>2) To understand how low-income Spanish-speaking Mexican immigrant parents feel the content and format of oral health instructions</li> <li>3) To understand how these parents see their role in caring for their children's teeth</li> </ol> | 25/30 parents recalled receiving oral hygiene instructions with the format and effectiveness of instructions varying. More engaging educational approaches were recalled and described in more detail than less engaging education approaches.   | Most parents recalled receiving oral hygiene and nutrition instruction as part of their child's dental visit and reported incorporating the instructions into their children's home routine. |
| 2015 | Hoelt, <i>et al.</i> | Using community participation to assess acceptability of "Contra Caries", a theory-based, <i>promotora</i> -led oral health education program for rural Latino parents: a mixed methods study | To describe the qualitative findings of the acceptability of curriculum content and activities, presents the process of refinement of the curriculum through engaging the target population and <i>promotoras</i> , and presents results of the acceptability of the curriculum once implemented.  | 12 focus groups were conducted with 105 parents. Attendance and retention were high (89% and 90% respectively). The study found that parents were not only interested in, but attended classes focused on increasing their knowledge and skills. The <i>Contra Caries</i> content and format were found as acceptable. | The <i>Contra Caries</i> Oral Health Education Program was acceptable to low-income, Spanish-speaking parents of children 1-5 years.   |

**Table 1 – Continued**

| Year | Authors                  | Title  | Objective   | Results  | Conclusions   |
|------|--------------------------|--|---|--|---|
| 2018 | Finlayson, <i>et al.</i> | Child, caregiver, and family factors associated with child dental utilization among Mexican migrant families in California | To identify factors related to dental utilization in the past year among children in Mexican migrant families, accounting for understudied psychosocial caregiver and family factors                    | 76% of children had visited the dentist in the past year while 8.6% had never visited. Gender and insurance played factors for the children, while education and depressive symptoms played as factors for caregivers. Uninsured children were less likely to have a past dental visit compared to insured children (OR= 0.23, CI= 1.36-13.61). Higher caregiver education was positively associated with child dental utilization (OR= 4.50, CI= 1.50-13.55). | Child age and dental insurance, and caregiver education and dental utilization history were associated with whether a child had a past year dental visit.   |
| 2010 | Finlayson, <i>et al.</i> | Dental utilization among Hispanic adults in agricultural worker families in California's Central Valley                    | To examine a range of predisposing, enabling, and need factors associated with past year dental visits in agricultural adult group using data collected from California's agricultural worker families. | 34% of adults had a past year dental visit, despite 44% reporting a regular dental care source. 66% lacked dental insurance, and 46% had untreated caries. 86% perceived having current need for care.   | Access to care has historically been difficult for this population in California. Common barriers of a lack of time, money, transportation, ability to take time off from work, basic oral health knowledge, perceived need, and dental providers have persisted. |

**Table 1 – Continued**

| Year | Authors                  | Title   | Objective   | Results   | Conclusions  |
|------|--------------------------|---|---|---|--|
| 2010 | Swan, <i>et al.</i>      | Rural Latino farmworker fathers' understanding of children's oral hygiene practices                           | To examine rural Latino farmworker fathers' understanding of their children's oral hygiene practices.   | Fathers had very little understanding of the etiology and clinical signs of dental caries. 18 of 19 fathers reported that their wife was primary care for children's hygiene. Fathers describes very minimal hygiene assistance given to children by either parent. Fathers generally thought a child did not need supervision after age 4.   | Rural Latino fathers might not actively participate in their children's oral hygiene, but they do place a value on it. Men are supportive of dental treatment, although later than recommended.              |
| 2011 | Hoelt, <i>et al.</i>     | Maternal Beliefs and Motivations for First Dental Visit by Low-Income Mexican-American Children in California | To examine the meanings and practices of parents around first dental visits for their children.   | 51% of first dental visits were for parent-initiated reasons, pain or visual dental problems. 49% were initiated by external prompts, recommendations from school. Once a child went to the dentist, 94% continued for regular checkups. Mean age for first dental visits were 3.   | These low-income, urban Mexican-American parents are taking their children to their first dental visit around 3 years of age, later than recommended.  |
| 2014 | Finlayson, <i>et al.</i> | Dental utilization by children in Hispanic agricultural worker families in California                         | To investigate predisposing, enabling, and need factors associated with children's past year dental utilization among Hispanic agricultural worker families in central California | 51% of children had a past year dental visit, 23% had never been to a dentist. Children were less likely to have a past year dental visit if they were foreign-born, male, had caregivers that thought they had cavities or were uninsured. Children aged 6-12, with a regular dental care source, and whose caregivers had a recent visit were more likely to have a past year dental visit. | Children were more likely to have a past year dental visit if they had a usual source of dental care (OR= 4.78, CI= 2.51-9.08), and if the caregiver had a past year dental visit (OR= 1.88, CI= 1.04-3.38). |

**Table 1 – Continued**

| Year | Authors              | Title  | Objective  | Results   | Conclusions   |
|------|----------------------|--|--|---|---|
| 2009 | Hoeft, <i>et al.</i> | Mexican-American mothers' initiation and understanding of home oral hygiene for young children               | To investigate caregiver beliefs and behaviors as key issues in the initiation of home oral hygiene routines   | Average age of tooth brushing initiation was 1.8 years; only 13% of parents initiated oral hygiene in accord with the American Dental Association (ADA) recommendations. 48% of children's' mothers were prompted with pediatrician and social service professionals. | 87% of the urban Mexican-American mothers in the study do not initiate oral hygiene practices in compliance with ADA recommendations.   |
| 2009 | Horton and Barker    | Rural Mexican Immigrant Parents' Interpretation of Children's Dental Symptoms and Decision to Seek Treatment | To understand low-income rural Mexican immigrant parents' decision-making process, how they define oral disease, and interpret their children's oral symptoms. | Most caregivers deduced the health of teeth from visible appearance. Caregivers often delayed treatment because they viewed their children's oral disease as mere "stains" requiring cleaning rather than as bacterial infections.                                    | Even when Mexican immigrant caregivers recognize a dental problem, they often misinterpret it as a "stain." Interpretations of decay were shaped by the caregivers' lack of experience with children's decay in rural Mexico. |

**Table 2:** Educational Attainment

| Article               | Number of Participants | Documentation              | Results   |
|-----------------------|------------------------|----------------------------|---|
| Hoelt et al. 2015     | 105                    | Categories of school years | 6 years or less = 35 (33%)<br>7-11 years = 18 (17%)<br>High school diploma = 33 (31%)<br>More than high school = 19 (18%) |
| Chang et al. 2018     | 27                     | Averaged years in school   | 9.4 +/- 3.3 years   |
| Swan et al. 2010      | 20                     | Averaged years in school   | 5.5 +/- 1.6 years   |
| Hoelt et al. 2011     | 48                     | Averaged years in school   | 9 +/- 2.8 years   |
| Hoelt et al. 2009     | 48                     | Averaged years in school   | 8.9 +/- 2.8 years   |
| Horton and Baker 2009 | 26                     | Averaged years in school   | 7.1 +/- 3.7 years   |

**Table 3:** Acculturation

| <b>Article</b>        | <b>Number of Participants</b> | <b>Documentation</b> | <b>Results</b>    |
|-----------------------|-------------------------------|----------------------|-------------------|
| Finlayson et al. 2010 | 326                           | ARSMA-II             | -3.4 +/- 1.0      |
| Finlayson et al. 2018 | 142                           | ARSMA-II             | -2.69 +/- 1.35    |
| Horton and Baker 2009 | 26                            | Years living in U.S. | 8.5 +/- 5.6 years |
| Hoelt et al. 2009     | 48                            | Years living in U.S. | 8.9 +/- 4.8 years |
| Swan et al. 2010      | 20                            | Years living in U.S. | 15 +/- 6.9 years  |
| Chang et al. 2018     | 27                            | Years living in U.S. | 15 +/- 7.3 years  |

**Table 4: Gender**

| Article               | Number of Participants | Documentation | Adults                                     | Children                                   |
|-----------------------|------------------------|---------------|--|--|
| Finlayson et al. 2010 | 326                    | Gender        | Male = 106 (32.5%)<br>Female = 220 (67.5%) | N/A  |
| Finlayson et al. 2018 | 142                    | Gender        | N/A  | Male = 47.2%<br>Female = 52.8%             |
| Horton and Baker 2009 | 51                     | Gender        | Female = 26 (100%)                         | N/A  |
| Hoefl et al. 2009     | 119                    | Gender        | Female = 48 (100%)                         | Male = 40 (57%)<br>Female = 31 (43%)       |
| Swan et al. 2010      | 20                     | Gender        | Male = 20 (100%)                           | N/A  |
| Chang et al. 2018     | 102                    | Gender        | Female = 27 (100%)                         | Male = 39 (52%)<br>Female = 47 (45%)       |
| Hoefl et al. 2015     | 210                    | Gender        | Male = 24 (23%)<br>Female = 81 (77%)       | Male = 58 (55%)<br>Female = 47 (45%)       |
| Finlayson et al. 2014 | 405                    | Gender        | N/A  | Male = 210 (51.8%)<br>Female = 195 (48.2%) |
| Hoefl et al. 2011     | 48                     | Gender        | Female = 48 (100%)                         | N/A  |

**Table 5: Age**

| <b>Article</b>        | <b>Number of Participants</b> | <b>Documentation</b> | <b>Adults</b> | <b>Children</b>                              |
|-----------------------|-------------------------------|----------------------|---------------|--|
| Finlayson et al. 2010 | 326                           | Age (years)          | 36.7 +/- 9    | N/A  |
| Finlayson et al. 2018 | 142                           | Age (years)          | N/A           | 0-5 = 26.8%<br>6-11 = 45.8%<br>12-17 = 27.5% |
| Horton and Baker 2009 | 51                            | Age (years)          | 30.4 +/- 6.2  | 2.3 +/- 1.4                                  |
| Hoefl et al. 2009     | 119                           | Age (years)          | 31.1 +/- 5.6  | 5.0 +/- 2.6                                  |
| Swan et al. 2010      | 20                            | Age (years)          | 38 +/- 6.4    | N/A  |
| Chang et al. 2018     | 102                           | Age (years)          | 35.1 +/- 6.9  | 6.8 +/- 4.5                                  |
| Hoefl et al. 2015     | 210                           | Age (years)          | 33.7 +/- 8    | 3.0 +/- 1.3                                  |
| Finlayson et al. 2014 | 405                           | Age (years)          | N/A           | 9.0 +/- 4.6                                  |
| Hoefl et al. 2011     | 48                            | Age (years)          | 31            | N/A  |

**Table 6:** Household Income

| Article               | Number of Participants | Documentation            | Results  |
|-----------------------|------------------------|--------------------------|--|
| Hoefl et al. 2011     | 48                     | Average annual income    | \$24,000   |
| Swan et al. 2010      | 20                     | Average annual income    | \$24,000   |
| Finlayson et al. 2014 | 405                    | Annual family income     | \$10,000 or less = 147 (30.6%)<br>\$10,000 - \$20,000 = 163 (40.2%)<br>\$20,001 or more = 95 (23.5%) |
| Finlayson et al. 2010 | 326                    | Annual family income     | \$10,000 or less = 110 (33.7%)<br>\$10,000 - \$20,000 = 142 (43.6%)<br>\$20,001 or more = 74 (22.7%) |
| Hoefl et al. 2015     | 51                     | Annual family income     | \$19,000 +/- 9,400   |
| Hoefl et al. 2009     | 48                     | Annual family income     | \$24,600 +/- 12,800  |
| Horton and Baker 2009 | 26                     | Annual family income     | \$17,000 +/- 5,700   |
| Finlayson et al. 2018 | 142                    | Monthly household income | <\$1,499 = 77 (54.2%)<br>>\$1,500 = 65 (45.8%)   |

