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Acculturation and orofacial pain among Hispanic adults

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Abstract

This study examined the associations between acculturation and orofacial pain and healthcare among Hispanic adults. Understanding the effects of acculturation on Hispanic oral health may improve understanding of oral health disparities in the United States. Data were collected from 911 Hispanic adults reporting tooth pain and painful oral sores who were part of a larger study of South Florida residents conducted using random-digit dialing methodology. The survey was conducted in Spanish or English by bilingual interviewers per the choice of each respondent. Greater use of the Spanish language was associated with disparities in healthcare visits for orofacial pain, not having a usual dentist, having greater pain, increased difficulty eating and sleeping, and more depression. Respondents' and their parents' nativity (families that had been in the United States longer) and those identifying more closely to Hispanic culture were also predictive of several of the outcomes. Gender, financial status, and age, independent of acculturation, were also associated with orofacial pain, accessing health care, and pain-related loss of functioning among Hispanics. The data support the hypothesis that Hispanics with less acculturation are less able to access needed oral health care. This study highlights the need for outreach programs targeting recent Hispanic immigrants focusing on oral health care.

Keywords

Disparities; orofacial pain; dental pain; Hispanic; acculturation; depression; health care use; sleep disturbance

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Introduction

The Surgeon General's Report on Oral Health has called for a better understanding of factors associated with oral health disparities among underserved populations in the United States (US), including Hispanics (54). This aim is supported by data from US national representative samples that indicate Hispanics have greater decrements in oral health compared to Whites across a range of oral health markers (30, 50, 51).

Acculturation, the process through which individuals from one ethnic group adopt the beliefs and behaviors of another group (58), is one way to examine potentially meaningful differences within an ethnic group. Adaptation to the mainstream culture often leads to greater access and utilization of healthcare services, including oral health care, among Hispanic ethnic groups in the US (30). This variability in the use of oral health care is due in part to changing values, lifestyles, behaviors, and financial status (29, 33). Barriers to accessing oral health services among Hispanics include language differences, unfamiliarity with a foreign healthcare system, trust of traditional oral health care providers, and lack of insurance/limited financial resources (9, 25, 33, 50). Logically, we would expect these reduced levels of oral health care to be associated with increased disease.

Only two studies have reported on acculturation and oral health care using samples of Mexican Americans, Cuban Americans, and Puerto Ricans that participated in the Hispanic Health and Nutrition Examination Survey (HHANES) from 1982–1984. Solis et al. (30) found that Cuban and Mexican American males who were more acculturated were more likely to use preventive healthcare, and Stewart and colleagues (50) found that the use of Spanish language (acculturation) was associated with a lower probability of having a dental visit in the past 5 years.

Pain is a common symptom from orofacial disease, and is strongly associated with perceived need for dental care (13, 14). The impact of oral pain is substantial. Locker and Grushka (37) assessed the impacts associated with suffering from oral pain. Of respondents with oral pain in the past month, 70% worried about their oral health, 44% consulted a doctor, 30% avoided eating certain foods, 29% took medications, and 14% experienced sleep difficulty. Murray et al. (40) found that patients presenting at a dental research clinic experiencing orofacial pain reported four times the functional problems, such as difficulty chewing foods, and a nine-fold increase in reports of depression than patients with oral symptoms not associated with pain. We have been unable to identify studies linking acculturation to orofacial pain. However, a recent paper has identified an association between acculturation score and widespread pain (41).

This study is unique in that it tested for associations between orofacial pain and three different dimensions of acculturation: language use, nativity, and ethnic identification. The focus of this study is on Hispanics in South Florida, a group of Americans whose oral health is poorly studied. Collecting data from a single community allows closer examination of within-group differences which is important to future considerations for research and public health policy. This study tested the hypothesis that acculturation is associated with orofacial pain and painrelated loss of physical and emotional functioning, as well as several variables that reflect access to oral healthcare within a Hispanic sample.

Materials and Methods

Sampling methods

The data for this study were collected as part of larger study of community-dwelling adults in Broward and Miami-Dade counties in South Florida on orofacial pain and healthcare

decisions among differing racial/ethnic groups. Eight strata were defined that considered race/ethnic concentration (predominately Hispanic, non-Hispanic Black, non-Hispanic White, and Mixed) and income (above and below $35K annual income). At the beginning of data collection, telephone numbers were generated using the GENESYS telephone bank database system that reflected the percentage of the total population of each stratum. Each month additional phone numbers were generated and released with small adjustments made to maintain a rate of completed interviews for each stratum consistent with the target goals. Small adjustments were made each month to maintain a rate of completed interviews for each stratum consistent with the target goals. As the rate of business or government numbers, non-working and disconnected numbers, and answering machines were different for each strata; this allowed us to maintain even completion rates rather than have to disqualify interested respondents because a certain race and ethnicity quota for a certain strata was full. Using this strategy, a total of 70,068 telephone numbers was generated and resulted in 25,548 households contacted.

The potential participants were contacted by trained interviewers employed by the University of Florida's Bureau of Economic and Business Research Survey Program. A sample of 10,341 respondents answered questions about race, ethnicity, sex, and age and were screened for several targeted pain symptoms. Of the 1341 Hispanics who were eligible and participated in this study, the 911 that reported tooth pain and or painful oral sores are included in this study (530 reported tooth pain, 165 reported painful oral sores, and 216 reported both). The remaining 430 Hispanic adults reported other pain complaints that are more likely to be seen by a physician.

Criteria for study inclusion included residing in one of the two counties, English/Spanish as first language, capable of answering questions, race/ethnic background criteria, 18+ years of age, and meeting pain symptom criteria. Respondents were given the choice to take the survey in English or Spanish. Translation of the survey instruments into Spanish was accomplished by including several persons from differing Hispanic subgroups to reduce error from the varying dialects in the Spanish-speaking world. This project was approved by the Institutional Review Board at the University of Florida, and informed consent was obtained from the participants.

It is acknowledged that there are limitations to data collection using telephone interviews. These include issues of sampling that involve the differential accessibility of a telephone in each home across socioeconomic strata and the potential for difficulty ensuring the objectives of each question and subsequent responses are clearly understood. There is evidence that the effectiveness of telephone interviewing is improved among populations with lower levels of income and education when the survey is administered in the interviewee’s native language (38). Gilbert et al. (21) evaluated bias introduced into an oral health study by limiting a sample to households with telephones or resulting from using only listed telephone numbers. They found the group most likely to be excluded was poor, younger males; however, they concluded only minimal bias was introduced by either of these factors.

Measures

Race/Ethnicity and acculturation—Respondents were asked if they were of Hispanic/Latino origin, then asked to self-select a race. If more than one race was selected, they were asked with which race they most closely identify. Race and ethnicity will be used acknowledging that race and ethnicity are not biological constructs, but rather social constructs that nonetheless may serve as a marker for differences in health behaviors (24). Questions were asked on language, nativity, and cultural identification to determine levels of acculturation among the Hispanics surveyed (see Table 1). Race and ethnicity were asked as

recommended by the US Department of Health and Human Services (59). The cultural identification items were drawn from the *Multigroup Ethnic Identity Measure* (43). Reliability estimates and construct validity have been reported as acceptable (17).

Orofacial pain related symptoms—All questions relied on self-reporting pain and associated symptoms and behaviors. Respondents were asked if they suffered from tooth pain or painful oral sores more than once in the past six months (36). Respondents were then asked to rate orofacial pain and impact of pain on functioning (interfere with your ability to eat the foods you usually eat, interfere with your sleep, and feel depressed) on a scale of 0–10. Pain and pain related items were asked as recommended by Price et al. (44) and used by Wade (56, 57) and Riley (47).

Access variables—Respondents were asked whether they had seen a medical doctor, dentist, or nurse about their pain symptom in the past 6 months, whether they needed to visit a health care provider because of the pain in the next several weeks, and if there was a particular dentist or health clinic that they usually go to for oral health care. The access variables were adapted from items used in the National Health Interview Survey and NHANES (8).

Economic variables—Discretionary income was measured using the following response choices: Can't make ends meet, manage to get by; I have enough to manage plus some extra; Money is not much of a problem… I can buy whatever I want. Ability to pay an unexpected $500 dental bill was measured using these response choices: Not able to pay the bill; Able to pay but with difficulty; Able to pay comfortably. Dental insurance coverage was determined by the following: Some people have dental insurance that pays for part of their dental bills, such as from an employer, Medicaid, or the VA. Are you covered by any such dental insurance program? Census tract median income was also recorded.

Pre-test of survey

The 7-day test-retest reliability of the Spanish and English versions of the survey instrument were pilot tested in 65 and 100 community-dwelling adults respectively. Reliability coefficients for the pain measures ranged from .92-.79, health behaviors from .84-.69, acculturation measures 96-.68, and economic variables .78-.74 (18). The depression, sleep, and difficulty eating items were tested in a validation study using a clinical sample against the Beck Depression Inventory (4), *Pittsburg Sleep Inventory* (5), *Oral Health Impact Profile* (49) with validity coefficients of .72, .69, and .59 respectively (42).

Statistical Analysis

All results were weighted estimates that reflect the population of interest, rounded to the nearest whole number. Weights were developed using special tabulations provided by the U.S. Census Bureau that detailed the distribution of target populations provided by age, sex, race, and poverty status (55). A series of multiple regressions for interval-level dependent variables, or logistic regressions for nominal dependent variables, were used to test for associations between acculturation domain variables and orofacial pain, impact of pain on functioning, and healthcare use for tooth pain and painful oral sores. The demographic and economic variables were entered in the first block followed by the acculturation variables in the second block. For analysis that focused specifically on tooth pain or painful sores, the pain covariates of frequency and duration were also entered in the first block.

Interaction effects were tested separately between acculturation domain variables, sex, and age. Independent variables were screened for multicollinearity using the condition index described by Belsley, Kuh, and Welsch (6). A principle components analysis was performed

using a Direct Oblimin rotation to account for the high multicollinarity of the acculturation variables and to adjust for differences in scaling. Three factors were formed as expected: language, cultural identification, and nativity with factor regression scores (like z-scores) used as acculturation domain variables in model testing. Therefore, the acculturation variables would be continuous, normally distributed, of interval level measurement, have a mean of 0, and a score of 1 or -1 would represent a respondent's score that was a standard deviation above or below the mean for that factor. Acculturation scores were coded so that higher values represent greater acculturation. That is, greater use of the English language, greater number of family members born in the US, and greater identification with other cultures resulted in more positive scores. Discretionary income and the ability to pay variables were also highly correlated and summed into a single variable labeled "financial status". Age was dummy coded into groups with 25–44 used as a reference for groups 18–24, 45–64 and 65+. Male gender was the reference group and coded as "0".

Although item non-response was low, some respondents were unable to or refused to answer particular survey items. The most common missing data were "ability to pay" (1.8%) and "discretionary income" (1.2%). Other variables ranged from 0.9% to no missing values. We performed multiple imputation, a simulation-based approach which allows for analysis with the full data set by making calculated estimates of the missing values using other variables in the model (16).

Results

Characteristics of the sample

Of these 911 Hispanic adults (unweighted n) who reported orofacial pain there were 264 men (29%) and 647 women (71%). Fifty-six percent (n=507) chose to take the survey in Spanish. The distribution for language spoken was as follows: 189 (21%) spoke only Spanish, 240 (26%) spoke mostly Spanish, 335 (37%) spoke Spanish and English equally, 124 (14%) spoke mostly English, and 23 (3%) spoke only English. The majority of respondents were born outside of the US (n=677, 74%). Of those born outside the US, the mean number of years living in the US was 19.7 (SD=14.0). Forty-seven percent reported some form of dental insurance (n=428) and 27% reported they could comfortably pay for an unexpected dental bill of $500 (n=250). Weighted n will be reported from this point forward.

Access to Health Care

Odds ratios and 95% confidence intervals for predictors of having at least one health care visit are presented in Table 2. Of Hispanic respondents reporting tooth pain, 40% (n=295) had at least one pain-related healthcare visit in the past 6 months. Of Hispanic respondents reporting painful oral sores, 20% (n=74) had a related healthcare visit in the past 6 months. Hispanic females were 1.7 times more likely than males to have had a healthcare visit for painful oral sores. Respondents in the 18–24 age group were significantly less likely to have a healthcare visit for either of the orofacial pain symptoms than the reference group of 25–44 year olds, whereas persons over the age of 65 were significantly more likely to have a healthcare visit for orofacial pain. Economic variables did not predict having a healthcare visit for orofacial pain. Greater use of the English language was associated with an increased likelihood of having a healthcare visit for both tooth pain and painful oral sores.

Odds ratios and 95% confidence intervals for predictors of having a usual dentist and currently needing a health care visit because of orofacial pain are presented in Table 3. Sixty percent (n=547) of Hispanic respondents reported having a usual dentist. Hispanic females were 1.6 times more likely than males to have a usual dentist. In addition, persons in the 45

years or older groups were more likely to have a usual dentist than respondents who were 25–44 years of age. Greater financial status was associated with having a usual dentist, and having dental insurance was associated with a higher probability of having a usual dentist by 2.4 times. Greater use of English and less identification with Hispanic culture were associated with having a regular dentist.

Twenty-four percent (n=214) of Hispanic respondents reported needing a health care visit in the next two weeks because of orofacial pain. Respondents 18–24 years of age were less likely and older respondents (45–64 and 65+) were more likely to need a health care visit than the reference group of 25–44 year olds. Lower financial status and census tract income were associated with an increased likelihood of reporting the need a healthcare visit for orofacial pain. Acculturation variables entered in Block 2 were not significantly associated with current need for a healthcare visit.

Of the 525 Hispanic respondents who reported having a usual dentist, 387 (74%) identified their dentist as Hispanic. To test for an association between having a Hispanic dentist and several of the acculturation and access variables, we performed logistic regression adjusting for age and sex. We found that current need for a pain-related healthcare visit and having a visit in the past 6 months for either pain symptom were not associated with having a Hispanic dentist. However, having a Hispanic dentist was associated with greater use of the Spanish language (OR=1.4, p<.001), born outside the US (OR=5.8, p<.001), fewer years lived in the US among those not born in the US (OR=0.9, p<.001), not having dental insurance (OR = 0.8, p=.009), and lower financial status (OR=0.7, p<.001). Of the pain and pain impact variables only greater depression (tooth pain, OR=1.1, p <.001; painful oral sores, OR=1.1, p <.001) was significantly associated with having a Hispanic dentist.

Oral Pain and Related Emotional and Physical Functioning

Regression coefficients for variables predicting tooth pain and related functioning are presented in Table 4. Hispanic females had significantly greater pain intensity and decrement in emotional and physical functioning compared to males. Older Hispanic adults were significantly more likely to experience pain-related depression than younger Hispanics. Lower economic status was consistently associated with greater pain intensity and reduced physical and emotional functioning than those of higher economic levels. Greater use of the Spanish language was associated with greater pain intensity, increased sleep difficulty and depression among respondents with tooth pain. Interestingly, nativity was associated with tooth pain and sleeping difficulty in the opposite direction in that more recent immigration status was associated with less pain and sleep problems.

Regression coefficients for variables predicting painful oral sores and related functioning are presented in Table 5. Hispanic females had greater pain intensity and increased pain-related depression compared to males. Older Hispanic adults had significantly greater pain intensity and decrement in emotional and physical functioning compared to younger Hispanics. Lower economic levels were associated with greater pain intensity and reduced physical and emotional functioning compared to higher economic levels, with financial status the most consistent predictor. Less acculturation was associated with greater difficulty eating and sleeping and increased depression. Greater use of the Spanish language was associated with greater pain intensity, greater sleep difficulty and increased depression among respondents with painful oral sores. Similar to tooth pain, nativity was associated with pain intensity and sleep difficulty in that more recent immigration status was associated with less sleep problems.

Discussion

Severe orofacial pain impacts people from all cultures; however there is a greater impact on ethnic minorities, such as Hispanics, who may not have to access appropriate oral healthcare (11). Few studies have examined determinants of oral health disparities within ethno-cultural groups. This paper reports findings on health disparities related to orofacial pain within a sample of Hispanic adults with a focus on acculturation.

Acculturation and Health Care Use

It has been established that Minority Americans are less likely to report a dental visit in the past year than White Americans (39). Among Hispanics, experiencing oral pain is one of the strongest predictors of having had a dental visit and the perceived need of a dental visit (14). However, these studies were designed to make comparisons across race and ethnic groups, not to explain variability within a group. We are unaware of another study that used a broad range of measures of acculturation to test hypotheses related to painful symptoms associated with oral disease within a Hispanic sample.

Language was consistently the strongest predictor of having a pain related oral healthcare visit among the acculturation variables. The more often participants spoke Spanish the less likely they were to report a healthcare visit for orofacial pain. Results from HHANES support the hypothesis that language spoken is a predictor of utilization of oral healthcare for Hispanics (30, 50). Ismail and Szpunar (31) also found that highly-acculturated Mexican Americans were more likely to have insurance and regularly visit the dentist than those with low levels of acculturation.

Solis et al. (50) believed that the association between language and access to healthcare may be less a problem of cultural factors influencing care decisions and more a language access issue, with the implication being that there were few Hispanic health care providers available during the time of HHANES (early 1980s). However, the current study was conducted in South Florida from 2004–2006, where bilingual caregivers or staff may have been more common. This notion is supported by our finding that 74% of Hispanics reporting a usual dentist identified that dentist as Hispanic. Recent findings indicate that many Hispanic dentists speak Spanish and live in and serve predominately Hispanic communities (27).

We found that in addition to language, cultural identification was associated with having a usual dentist. That is, respondents who strongly identified with Hispanic culture or spoke primarily Spanish were less likely to have a usual dentist. Other studies have demonstrated that having a usual dentist is an important determinant of the frequency of dental visits regardless of geographic location or diversity of the population (3, 13, 15, 20).

Acculturation, Pain Intensity, and Pain-Related Functioning

The reciprocal relationship between oral disease and lack of oral healthcare certainly contribute to orofacial pain-related health disparities. It has been documented that delaying needed care for oral pain increased the likelihood that patients are dissatisfied with subsequent treatment and suffer from additional impact of oral pain (45). Our data indicate that greater use of Spanish was associated with higher tooth pain intensity ratings. Interestingly, respondents who had been in the United States longer also had more pain than those who had immigrated more recently. This seems contradictory, as one could expect that respondents living in the United States longer should be using more English and, therefore, better able to negotiate the healthcare system. Apparently, for some Hispanics, greater nativity does not equate to greater use of English as some Hispanic immigrants may have lived in the United States for years, but have been able to function within their communities

learning little English. This would be consistent with our finding that Hispanics who rely on the Spanish language were significantly more likely to have a Hispanic dentist than Hispanics who spoke mostly English; consequently, for these persons language may not serve as a barrier to oral healthcare.

Orofacial pain has been linked with difficulty chewing and disturbed sleep (2, 10, 11, 37), with several studies suggesting cross-cultural variability in the perception of these oral impacts (9, 53). We found that increased use of the Spanish language was associated with greater interference with eating and increased difficulty sleeping, possibly as a function of the increased pain that was also associated with Spanish language use. Atchison et al. (2) also found that less-acculturated Hispanics reported more problems with oral health including pain while eating.

Orofacial pain not only impacts daily activities such as eating and sleeping, but also impacts emotional well-being (26). Among Hispanics, as well as other ethnic groups, poor oral health has been associated with higher levels of depression (52). In this study, increased use of Spanish was associated with higher levels of pain-related depression. Bates et al. (3) reported qualitative differences on the experience of pain and found that emotional responses to pain were more acceptable to Hispanics than to several other ethnic groups. It is possible that Hispanic respondents in our study were openly expressing greater emotions related to pain because they are comfortable within their cultural surroundings. Lipton and Marbach (35) also suggested that Hispanic cultures may be more comfortable reporting emotions associated with pain over the sensory aspects of pain. Links between pain and depression in Hispanics populations warrant further research. Other studies have reported inconsistent findings for the direction of the association between acculturation and depression, (not specifically related to pain) (12, 23, 28).

Other Factors Impacting Health Care Use and Pain

Independent of acculturation, compared to Hispanic males, Hispanic females had greater access to oral health care, but increased pain intensity, more depression, and a greater impact on eating - all of which are markers for oral disease. Consistent with findings reported by Graham et al. (25), we found that Hispanic females were more likely to have a regular dentist than males. It is generally accepted that women use more healthcare services than men across all ethnicities (7) and are more likely to have a usual healthcare provider (34).

Low socioeconomic status is a risk factor for orofacial pain and females of lower economic levels are at the highest risk as reported by Riley et al. (46). In this sample, higher financial status and having dental insurance were both associated with having a usual dentist, as could be expected. Having dental insurance has been suggested as a major facilitator in dental care use among Hispanics as indicated by both Stewart et al. (50) and Graham et al (25). We found that lower economic status was associated with the currently need for healthcare for orofacial pain with over 25% reporting a need for treatment. The need for dental care as perceived by potential patients is highly correlated with dental services use (19, 22). Other studies have shown that Hispanics are one of the least likely groups to obtain dental care (1, 48). However, the construct of perceived need for oral healthcare may operate independently of access issues. Lower economic status and lack of dental insurance were also associated with more depression, difficulty eating, and difficulty sleeping for reported tooth pain further emphasizing the impact of this unmet need.

Age was associated with several of the health care variables, with older Hispanics most likely to have had a visit for orofacial pain, have a usual dentist, but also report the current need for treatment. In other studies, older Hispanic adults were less likely to have visited the

dentist than middle-aged Hispanic adults (32) and were less likely to visit the dentist than similar-aged White adults (14).

Implications and Conclusion

This study found that low levels of acculturation, especially greater use of the Spanish language, were associated with less access to oral healthcare for orofacial pain, greater pain intensity, and increased problems with physical and emotional functioning among a sample of Hispanics living in South Florida. Limitations for this study include self-reported data and distinct geographic sample regions that may not be representative of other areas with other Hispanic populations.

This study has implications for health policy, practice management, and patient-centered care. Hispanic populations in the US should be provided with information and education to improve knowledge about oral health and ways to access dental care. Oral health campaigns should be translated into Spanish in areas with large Hispanic populations. Bilingual materials and staff should be available for dental patients, and minorities should be recruited into dental education programs in order to provide services to the growing Hispanic community. This study also suggests that depression associated with orofacial pain is a common sequelae of increased oral disease, so training dentists to identify symptoms of depression in patients should help overall care and treatment plans' success rate.

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Perspective

This study found that lower levels of acculturation, particularly less frequent use of English, were associated with greater oral pain and depression for Hispanics adults. This emphasizes the need to provide Hispanic patients with information in Spanish and the importance of having bilingual materials and staff in dental clinics.

Table 1

Items for acculturation variables.

Language. What languages do you speak? What languages are spoken at home? Response choices were: Spanish only; Mostly Spanish but some English; Spanish/English equally; Mostly English but some Spanish; English only. Language chosen for baseline interview: Spanish, English.
Nativity. Were you born in one of the 50 states or Washington D.C.? Was your mother born in one of the 50 states or Washington D.C.? Was your father born in one of the 50 states or Washington D.C.?
Cultural Identification. I participate in cultural practices of my own group such as special food, music, or customs. I like meeting and getting to know people from ethnic groups other than my own. I am not very clear about the role of ethnicity in my life. I have a strong sense of belonging to my own ethnic group. Response choices: Strongly agree, Somewhat agree, Somewhat disagree, Strongly disagree.

Note: The language, acculturation, and nativity factor scores (z-scores) were coded so that greater use of the English language, greater number of family members born in the US, and greater identification with other cultures are indicated by more positive scores.

Table 2

Having an orofacial pain-related health care visit in the past six months.

Variables	Tooth pain OR (95% CI)	Painful oral sores OR (95% CI)
Block 1 - Demographic and economic		
Gender		
Female	1.5 (0.9–2.4)	1.7 (1.0–2.8) *
Male	1.0	1.0
Age		
18–24	0.3 (0.2–0.6) **	0.3 (0.1–0.5) **
25–44	1.0	1.0
45–64	0.7 (0.4–1.3)	1.2 (0.7–2.3)
65+	2.4 (1.0–8.9) *	3.7 (1.2–14.1) *
Dental Insurance	0.8 (0.5–1.4)	0.7 (0.4–1.1)
Financial status	1.1 (0.9–1.3)	0.9 (0.7–1.1)
Census tract income	0.9 (0.8–1.1)	1.0 (0.8–1.1)
Block 2 - Acculturation		
Language	1.5 (1.2–2.0) **	1.6 (1.2–2.3) **
Nativity	0.9 (0.7–1.2)	0.9 (0.6–1.2)
Identification	1.0 (0.7–1.2)	1.1 (0.8–1.4)

Note:

* p≤.05,

** p≤.01; n=746 for tooth pain; n= 381 for painful oral sores.

The health care visit item did not distinguish between scheduled and emergent health care contacts. Coefficients greater than 1 for the acculturation factors should be interpreted to mean an increase in acculturation is associated with the increased probability of the outcome occurring.

Table 3

Models predicting access to care

Variables	Having a usual dentist OR (95% CI)	Currently need a visit for oral pain OR (95% CI)
Block 1 - Demographic and economic		
Gender		
Female	1.6 (1.2–2.1) **	1.1 (0.8–1.5)
Male	1.0	1.0
Age		
18–24	0.8 (0.6–1.3)	0.4 (0.2–0.8) *
25–44	1.0	1.0
45–64	1.7 (1.2–2.2) **	2.0 (1.4–2.8) **
65+	2.2 (1.5–3.5) **	2.9 (1.8–4.4) **
Dental Insurance	2.4 (1.7–3.3) **	0.9 (0.7–1.4)
Financial status	1.7 (1.2–1.5) **	0.8 (0.7–0.9) *
Census tract income	1.1 (0.9–1.2)	0.8 (0.7–0.9) *
Block 2 - Acculturation		
Language	1.6 (1.3–1.9) **	1.0 (0.8–1.2)
Nativity	1.0 (0.8–1.3)	1.1 (0.9–1.3)
Identification	1.2 (1.1–1.4) *	1.1 (0.8–1.1)

Note:

* p≤.05,

** p≤.01; n=911.

Coefficients greater than 1 for the acculturation factors should be interpreted to mean an increase in acculturation is associated with the increased probability of the outcome occurring.

Table 4

Model for tooth pain and pain impact

Variables	Pain intensity B (SE)	Depression B (SE)	Eating B (SE)	Sleep difficulty B (SE)
Block1 - Block1 - Demographic and economic				
Gender	.570 (.222) **	.357 (.308) *	.650 (.273) *	.962 (.314) *
Age	.046 (.130)	.855 (.184) **	−.278 (.164)	.464 (.189)
Dental Insurance	−.304 (.287)	−.859 (.337) *	−.625 (.296) *	−.599 (.309)
Financial status	−.187 (.083) *	−.410 (.133) **	−.245 (.114) *	−.559 (.201)**
Census tract income	−.134 (.064) *	−.336 (.100) **	−.172 (.080) *	−.354 (.091)**
Block2 - Acculturation				
Language	−.441 (.121) **	−.680 (.180) **	−.129 (.148)	−.506 (.175)**
Nativity	.206 (.104) *	−.107 (.154)	.265 (.138)	.292 (.148) *
Identification	.074 (.107)	−.205 (.147)	.028 (.131)	.097 (.155)

Note:

* p≤.05,

** p≤.01, n=746.

Positive coefficients for the acculturation factors should be interpreted to mean an increase in acculturation is associated with an increase in the value of the outcome variable.

Table 5

Model for a painful oral sore and related impact

Variables	Pain intensity B (SE)	Depression B (SE)	Eating B (SE)	Sleep B (SE)
Block 1 - Demographic and economic				
Gender	.699 (.301) **	.791 (.384) *	566 (.396)	.283 (.420)
Age	.570 (.195) *	1.517 (.270) **	.447 (.203) *	.984 (.250) **
Dental insurance	−.485 (336)	−.960 (.437) *	−.403 (.433)	−.830 (.458)
Financial status	−.279 (134) *	−1.100 (.174) **	−.279 (.133) *	−.922 (.183) **
Census tract income	−.191 (095) *	−.257 (.124) *	−.030 (.123)	−.142 (.130)
Block 2 - Acculturation				
Language	−.349 (.165) *	−1.138 (.236) **	−.533 (.247) *	−.921 (.253) **
Nativity	.289 (.140) *	−.232 (.193)	−091 (.201)	.333 (.163) *
Identification	−.137 (.157)	−.255 (.186)	−.006 (.192)	−.388 (.182) *

Note:

* p≤.05,

** p≤.01, n=381.

Positive coefficients for the acculturation factors should be interpreted to mean an increase in acculturation is associated with an increase in the value of the outcome variable.