Oral Health and Use of Dental Services Among Hispanics

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Abstract

Objectives: *This study examined factors related to oral health and dental service use among Mexican-Americans, Cuban-Americans, and Puerto Ricans from the Hispanic Health and Nutrition Examination Survey, 1982–84 (HHANES).* ***Methods:*** *Categorical measures of oral health were created: (1) perceived oral health status, (2) evaluated oral health status, (3) decayed permanent teeth, (4) teeth missing due to caries, (5) total permanent teeth present, and (6) periodontal classification. The effects of acculturation, education, dental insurance, and perceived condition of teeth and gums on dental service use in the past two and five years were examined using logistic regression. All analyses were performed separately for each of the three samples using SAS-callable SUDDAN.* ***Results:*** *Dental insurance and education were the most important factors in determining use of dental cleanings and use of dental care. For Mexican-Americans, Cuban-Americans, and Puerto Ricans, acculturation was a factor in determining use of dental care in the past five years.* ***Conclusions:*** *While dental insurance and education appear to be the most important factors for determining both use of dental cleaning services and use of dental care in all three samples, acculturation also had some impact for determining use of dental care. [J Public Health Dent 2002;62(2):84-91]*

Key Words: health care accessibility, oral health, Hispanics, acculturation.

The recently released "Oral Health in America: A Report of the Surgeon General" has refocused attention on the importance of oral health and the "profound and consequential disparities in oral health" in the United States (1). The report calls for better understanding of the factors that influence oral health among minority populations.

Hispanics are the fastest growing minority group in the United States (2,3). Between 1981 and 1995, approximately 5 million people from either Mexico, Cuba, Central America, or South America immigrated to the United States (4). Disparities in oral health have been recognized in the Healthy People 2010 report, which identifies Hispanics as needing improvement in several health areas (5). Researchers and policy makers historically have been concerned about barriers to care and mechanisms to reduce these barriers as a way to improve access to dental services and oral health. Commonly, income, insurance, education, culture, and language are cited as predictors of health service utilization for Hispanics.

Empirical evidence has demonstrated a strong association between acculturation and increased use of medical services (6-10), but limited research has examined the effects of acculturation along with other risk factors on oral health or dental service utilization among Hispanics. Further, oral health research has been limited in describing differences among Hispanic subgroups (11,12). Analyzing the subgroups of Hispanics may provide valuable insight, since groups differ with regard to culture, migration, national origin, health values, and sociodemographic characteristics.

Acculturation, as a social construct, reflects lifestyle and behavioral changes of people as they move from one culture and adapt to another culture, usually as a result of immigration (13,14). Variations in levels of acculturation exist within cultural groups and among different generations within a group. Acculturation has been shown to be a significant predictor of poorer Latino health and greater health service use. For example, Sundquist and Winkleby (15) found that among Mexican-Americans, language and nativity were major predictors of cardiovascular disease risk, with more acculturated subjects demonstrating higher risk. O'Malley et al. (16) studied Hispanic women in New York City and found a positive effect of acculturation on receiving health services. Otero-Sabogal et al. (17) reported that diet, smoking, and drinking habits, as a result of acculturation, were associated with increased cancer risk among Latinos. Others have reported differences in access to care and utilization of preventive services due to acculturation and language (18,19).

Cultural competence in the health care delivery system may play an important role in access to care. Just as acculturation may impact a patient's ability to navigate through the health care system, the cultural competency of health care professionals may have a similar effect on access to and utilization of care. In particular, the role of cultural competence in influencing patients' perceived access to care and utilization of services is an important health policy concern (20). If the community is well integrated within both English- and Spanish-speaking cultures, the effects of acculturation on access to dental care may be different than in monolingual communities. The cultural nature of the community and the acculturation of the individual are both important factors to consider (21,22).

Several studies have addressed oral health status and access in Hispanic populations in the United States (23-37). An analysis of the International Collaborative Study of Health Outcomes (ICS-II) data revealed that for two adult age cohorts (35–55 years and 65–74 years) in diverse ethnic groups

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(including Hispanics in San Antonio), race/ethnicity, education, fear of pain at dental visits, and oral hygiene were important predictors of perceived dental need (24). In a study using the same data, Davidson and Andersen (25) found that San Antonio Hispanic adults of primarily Mexican-American descent had increased dental contact if they were more motivated to visit the dentist, had a usual source of dental care, or experienced oral pain; however, these studies did not address the impact of acculturation over and above other factors on oral health service use.

Studies also have identified significant disparities in oral health of Hispanics as compared to other US adults and among Hispanic subgroups (11,26,27). Ismail and Szpunar (12) analyzed data from the 1982–84 Hispanic Health and Nutrition Examination Survey (HHANES) for prevalence of dental caries and periodontal disease and use of dental services among a group of low acculturated Mexican-Americans aged 12–74 years. They found that low acculturated Mexican-Americans were less likely than those with high levels of acculturation to have dental insurance or to have visited the dentist frequently. Since only Mexican-Americans were studied, no comparisons across Hispanic subpopulations were reported. As immigration to the United States from Puerto Rico, Mexico, and Latin America continues to increase, it is important to recognize that the US Hispanic population is not homogeneous and that different groups may have different perceptions of need and access to oral health care.

The purpose of this paper is to determine the relationship of acculturation, dental insurance, income, education, and perceived oral health on utilization of oral health services among the three major Hispanic subgroups (Mexican-Americans, Cuban-Americans, and Puerto Ricans) using the 1982–84 HHANES (28) data. In light of substantial evidence showing that acculturation is associated with health services access and utilization, we also wanted to test the effects of acculturation in combination with other factors, such as education, dental insurance, and perceived health, on access to and utilization of dental services. Therefore, in this paper, we will evaluate the following: (1) the differences in oral health status among the three samples; (2) the differences in access and utilization among the three samples; and (3) the independent effects of acculturation, education, dental insurance status, and self-reported oral health on the use of dental services among the three samples.

Methods

The methods and sampling design used in the 1982–84 Hispanic Health and Nutrition Examination Survey are described in detail elsewhere (29).

Sample. Mexican-Americans were sampled from five southwestern states: California, Arizona, New Mexico, Texas, and Colorado. Cuban-Americans were sampled from Dade County (Miami), Florida, and Puerto Ricans were from the New York City area. Households were screened for eligible respondents, who were asked general information about individuals in the household. The second part involved a physical examination and interview at a nearby mobile examination unit. HHANES included subjects aged 6 months to 74 years, but the current analysis focuses only on adults over the age of 17 years who self-identified as Mexican-American in the Southwest sample, Puerto Rican in the New York area sample, or Cuban-American in the Dade County sample, and who completed the dental health and physical examination portions of the study (N=6,324). The Mexican-American sample includes 3,867 respondents, the Cuban-American sample includes 958 respondents, and the Puerto Rican sample includes 1,499 respondents.

Measures: Demographics and Acculturation. Demographic measures included age, family income, and education. Subjects were grouped into four age ranges: 18–25 years, 26–34 years, 35–64 years, and ≥65 years. Annual family income was categorized into less than $20,000 and $20,000 or more. Three education categories were used: less than high school, high school or equivalent, and more than high school.

The construct of acculturation has been assessed in a variety of ways across clinical studies. Most studies include factors such as language, ethnic identification, and nativity (30-34). In the original report of the HHANES, an acculturation index was specifically constructed for Mexican-Americans, but not for Cuban-American or Puerto Rican samples. The Mexican-American acculturation index included eight items. The measure represented a subset of the 20-item scale developed by Cuellar et al. (31). The responses to the items were scored from low to high acculturation level. In the current analysis, the scale was reconstructed for each of the subgroups. Since data were not collected on ethnic identification of the respondents or the respondents' mothers or fathers for the Cuban-American and Puerto Rican samples, those items were eliminated in this analysis. The index used in the current analysis replicates a widely used four-item Hispanic acculturation index constructed by Marin et al., (32), which focuses on language proficiency, preference, and use. We constructed a four-item index scored from 0 to 16, where increasing numbers indicated a higher level of acculturation. Responses to the following items were summed to form the index:

1. What language do you speak?
2. What language do you prefer?
3. What language do you read better?
4. What language do you write better?

The coding for the first two variables, language spoken and preferred, was as follows: 0=Spanish only; 1=mostly Spanish, some English; 2=Spanish and English about equally; 3=mostly English, some Spanish; and 4=English only. The coding for the next two items, language read better and write better, was as follows: 0=reads (writes) Spanish only; 1=reads (writes) Spanish better than English; 2=reads (writes) Spanish and English equally well; 3=reads (writes) English better than Spanish; and 4=reads (writes) English only. Because of sample size limitations, the acculturation variable created for these analyses was limited to two categories: (1) low acculturation, represented by a score of 0 to 4; and (2) bilingual or high acculturation, represented by a score of 5 to 16.

Measures: Oral Health. Both perceived need and clinical findings were used to measure oral health status. The response categories of self-reported condition of teeth and self-reported condition of gums were dichotomized into excellent, very good, or good and fair, poor. Measures of clinical findings used were number of decayed

permanent teeth, permanent teeth missing due to caries, total permanent teeth present, and periodontal classification. A previous report by Ismail and colleagues summarized the criteria used during HHANES to measure oral health including periodontal disease (27).

Measures: Dental Service Use. Dental insurance status was treated as a binary variable representing those individuals with dental insurance and those individuals without dental insurance. Four measures were used to assess utilization of dental services: period since last dental care (2 years or less, over 2 years to 5 years, over 5 years, or never), ever had teeth cleaned by a dentist or dental hygienist, period since last had teeth cleaned (2 years or less, over 2 years to 5 years, over 5 years, or never), and main reason for last dental visit (preventive, restorative/prosthetic, periodontal, surgery/toothache).

Analytic Strategy. All analyses were performed separately for each of the three samples. Because HHANES is a complex, multistage, stratified, clustered sample, it was necessary to use SAS-callable SUDDAN version 7.5.6 (36) for all analyses. SUDDAN is a software package compatible with the SAS system that allowed the variances to be calculated correctly adjusting for the complex sampling design of HHANES. Percentages were calculated with normalized sample weights.

Edentulous persons were excluded from analyses that dealt with teeth cleanings. The multivariable models examined the effect of five independent variables: (1) acculturation, (2) education, (3) dental insurance, (4) perceived condition of teeth, and (5) perceived condition of gums on four dependent variables related to dental care use: (1) teeth cleaned by a dental hygienist or dentist in the past two years, (2) teeth cleaned by a dental hygienist or dentist in the past five years, (3) dental care in the past two years, and (4) dental care in the past five years. Dental insurance was left out of the final models because of possible colinearity problems. Multivariable logistic regression models were fitted to calculate adjusted odds ratios and their 95 percent confidence intervals.

Results

Demographics. The mean age of the each group was approximately 39 years with a range of 18–74 years. Most of the respondents in each group were 35–64 years old (Mexican-Americans, 40.6 percent; Cuban-Americans, 59.1 percent; and Puerto Ricans, 48.1 percent) (Table 1). The majority of each subgroup reported family incomes less than $20,000. For all three groups, the highest percentage had education levels less than high school. When categorized by acculturation level (low verses bilingual or high), 78.7 percent of Mexican-Americans, 51.1 percent of Cuban-Americans, and 72.6 percent of Puerto Ricans were categorized as bilingual or highly acculturated.

There were a large number of individuals with missing acculturation data in the HHANES dataset. Therefore, a subanalysis was conducted to compare those individuals who had missing acculturation data to those individuals who had acculturation data available. The goal was to see if those individuals with missing acculturation data were significantly different from those people with acculturation data, possibly giving a misleading picture of the acculturation variable's impact on health service utilization. An overall analysis of all the ethnic subgroups revealed that those individuals for whom there were missing acculturation data were more likely to be Mexican-American (chi-square=12.9, df=2, $P<.001$) than those individuals with acculturation data available. Separate analyses of each sample revealed that Mexican-Americans with missing acculturation data were more likely to have less than a high school education (chi-square=32.2, df=2, $P<.001$), not have dental insurance (chi-square=14.1, df=1, $P<.001$), and also reported that their teeth were in fair or poor condition (chi-square=8.8, df=1, $P<.003$) when compared to those Mexican-Americans with acculturation data available. Cuban-Americans with missing acculturation data were more likely to be older (chi-square=27.9, df=3, $P<.001$), more likely to have a lower income (chi-square=16.0, df=1, $P<.001$), and to have less than a high school education (chi-square=73.5, df=2, $P<.001$) compared to Cuban-Americans with acculturation data available. Lastly, Puerto Ricans who had missing acculturation data were only more likely to

TABLE 1
Sample Characteristics*

	Mexican-American (n=3,867) % (SE)	Cuban-American (n=958) % (SE)	Puerto Rican (n=1,499) % (SE)
Age (years)			
18–25	27.0 (0.8)	14.6 (0.1)	24.9 (1.4)
26–34	27.2 (1.1)	17.4 (0.1)	23.5 (0.3)
35–64	40.6 (1.1)	59.1 (0.2)	48.1 (0.3)
65–74	5.2 (0.3)	8.8 (0.1)	3.5 (0.1)
Annual family income			
Less than $20,000	63.6 (1.6)	57.6 (0.3)	67.5 (0.5)
$20,000 and above	36.4 (0.1)	42.4 (0.2)	32.5 (1.2)
Education			
Less than high school	54.3 (1.7)	44.7 (0.2)	48.5 (0.4)
High school or equivalent	25.4 (1.1)	24.4 (0.1)	30.5 (0.7)
More than high school	20.4 (1.5)	31.1 (0.1)	21.1 (0.4)
Acculturation			
Low	21.3 (1.6)	48.9 (0.2)	27.4 (0.3)
Bicultural or high	78.7 (2.0)	51.1 (0.2)	72.6 (0.9)

*All percentages were calculated with normalized sample weights (examination weights). Standard errors in parentheses.

TABLE 2
Oral Health Status*

	Mexican-American (*n*=3,867) % (SE)	Cuban-American (*n*=958) % (SE)	Puerto Rican (*n*=1,499) % (SE)
Condition of teeth (self-reported)†			
Excellent, very good, good	47.6 (1.1)	52.5 (0.2)	54.8 (0.9)
Fair, poor	52.4 (1.7)	47.5 (0.1)	48.2 (0.5)
Condition of gums self-reported)†			
Excellent, very good, good	65.3 (1.4)	78.3 (0.2)	67.9 (0.1)
Fair, poor	34.7 (1.5)	21.7 (0.1)	32.1 (0.5)
Decayed permanent teeth†			
None	55.0 (1.7)	62.5 (0.2)	49.1 (1.0)
One or more	45.0 (1.9)	37.5 (0.2)	50.9 (0.5)
Permanent teeth missing due to caries			
None	48.6 (0.8)	30.6 (0.1)	27.0 (0.6)
One or more	51.4 (0.9)	69.4 (0.2)	73.0 (0.9)
Total permanent teeth present			
No missing teeth	55.2 (2.3)	28.8 (0.1)	40.7 (0.6)
One or more missing teeth	48.8 (2.2)	71.2 (0.3)	59.3 (0.7)
Periodontal classification for mouth (both arches)†			
No periodontal disease	9.9 (1.0)	13.2 (0.1)	1.8 (0.1)
Gingivitis	77.6 (2.1)	77.4 (0.3)	85.9 (1.3)
One or more pockets	12.5 (1.0)	9.4 (0.1)	12.3 (0.2)

*Entries are not age adjusted. All percentages were calculated with normalized sample weights (examination weights). Standard errors in parentheses.
†Edentulous persons excluded from analyses.

have less than a high school education (chi-square=14.7, df=2, $P<.001$) compared to those Puerto Ricans with acculturation data available.

Oral Health Status. Table 2 reveals that self-reported condition of teeth was similar among all three groups (48–55% reporting excellent, very good, or good). A higher percentage of the Cuban-American sample (78.3%) reported excellent, very good, or good gum condition as compared to Mexican-Americans (65.3%) and Puerto Ricans (67.9%). Mexican-Americans and Puerto Ricans both had a mean of 1.4 (SE=0.10 and 0.08, respectively) decayed permanent teeth, while Cuban-Americans had a lower mean of 1.0 (SE=0.07) decayed permanent teeth. However, Mexican-Americans had a smaller number of teeth missing due to caries (mean=2.2, SE=0.04) compared to both Cuban-Americans (mean=5.8, SE=0.25) and Puerto Ricans (mean=4.56, SE=0.29).

Self-reported condition of teeth was similar for all three groups, with roughly half of each group reporting excellent, very good, or good and half reporting fair or poor. Self-reported condition of gums was similar for Mexican-Americans and Puerto Ricans with approximately two-thirds reporting excellent, very good, or good. More Cuban-Americans (more than three-quarters) reported excellent, very good, or good condition of gums.

Mexican-Americans had the most permanent teeth present (mean=27.2, SE=0.14) followed by Puerto Ricans (mean=25.6, SE=0.09) and Cuban-Americans (mean=24.0, SE=0.20). Binary variables for number of decayed permanent teeth, number of permanent teeth missing due to caries, and total number of permanent teeth were created for all analyses and results presented in Table 2. Periodontal disease findings were similar for Mexican-Americans and Puerto Ricans, with 12 percent of both groups having at least one periodontal pocket (periodontal score of 6 or 8 for individual teeth), whereas only 9 percent of the Cuban-Americans had a periodontal pocket.

Access and Utilization. Table 3 presents the results of the access and utilization measures. While the majority of individuals in all three groups had dental insurance, Cuban-Americans had the highest percentage of individuals with dental insurance (72.8%), followed by Mexican-Americans (63.6) and Puerto Ricans (57.8%).

For all three groups, more than half reported having had a dental visit and having had their teeth cleaned within the past two years. However, Mexican-Americans had the highest percentage reporting having never had their teeth cleaned (28.8%) and having over 5 years or never since last dental care (25.3%) or since last having teeth cleaned (29.2%). When indicating the main reason for the last dental visit, all three groups reported preventive as the most common reason. None of the three groups reported periodontal treatment in high frequency.

Mexican-Americans used dental care less recently than did the other two groups. They also had a higher percentage reporting surgery or toothache as the reason for the last dental visit, a higher percentage reporting never having had their teeth cleaned, and the lowest percentage reporting preventive reasons.

Factors Affecting Dental Care Use. Table 4 presents the results of multivariable models created using unconditional logistic regression with five independent (predictor) variables: acculturation, education, dental insurance, self-reported condition of teeth, and self-reported condition of gums, predicting four separate binary outcomes: (1) teeth cleaned by a dental hygienist or dentist in the past two years, (2) teeth cleaned by a dental hygienist or dentist in the past five years, (3) dental care in the past two years, and (4) dental care in the past five years.

For all three groups, level of education and dental insurance were the most consistent predictors of the use of dental services. Specifically, those individuals in all three samples with greater than a high school education were 20 percent to over 300 percent more likely to have had their teeth cleaned in the past two or five years or to have had dental care in the past two or five years. Those individuals with dental insurance in all three samples

TABLE 3
Access and Utilization Measures*

	Mexican-American (*n*=3,867) % (SE)	Cuban-American (*n*=958) % (SE)	Puerto Rican (*n*=1,499) % (SE)
Dental insurance			
Yes	63.6 (1.9)	72.8 (0.3)	57.8 (0.6)
No	36.4 (1.4)	27.2 (0.1)	42.2 (0.7)
Period since last dental care			
2 years or less	55.5 (2.2)	67.7 (0.2)	70.6 (1.0)
Over 2 years to 5 years	19.2 (0.8)	19.6 (0.2)	16.3 (0.3)
Over 5 years or never	25.3 (0.9)	12.7 (0.3)	13.1 (0.9)
Ever had teeth cleaned by dentist/dental hygienist†			
Yes	71.2 (2.5)	90.4 (0.4)	88.9 (1.4)
No	28.8 (2.3)	9.6 (0.1)	11.1 (0.1)
Period since last had teeth cleaned†			
2 years or less	57.3 (1.0)	66.3 (0.2)	66.9 (1.0)
Over 2 years to 5 years	13.5 (0.5)	17.8 (0.1)	15.3 (0.2)
Over 5 years or never	29.2 (0.8)	15.9 (0.2)	17.8 (0.8)
Main reason for last dental visit			
Preventive	35.7 (1.6)	40.9 (0.1)	42.6 (0.6)
Restorative/prosthetic	29.7 (0.9)	35.8 (0.2)	27.2 (0.6)
Periodontal	1.6 (0.1)	1.5 (0.1)	3.5 (0.4)
Surgery or toothache	33.0 (2.0)	21.8 (0.1)	26.7 (0.3)

*Entries are not age adjusted. All percentages were calculated with normalized sample weights (examination weights). Standard errors in parentheses.
†Edentulous persons excluded from analyses.

were 20 percent to 270 percent more likely to have had their teeth cleaned in less than two or five years or to have had dental care in less than two or five years.

In addition to dental insurance, for Mexican-Americans, acculturation was also a significant predictor of use of dental care in the last five years with highly acculturated Mexican-Americans 30 percent more likely to have dental care in the last five years than Mexican-Americans with low acculturation (OR=1.3; 95% CI=1.1, 1.6).

Acculturation was also important for determining dental care in the last two or five years for both the Cuban-American sample and the Puerto Rican sample. Specifically highly acculturated Cuban-Americans were 80 percent more likely to have used dental care in the past two years than Cuban-Americans with a low acculturation status (OR=1.8; 95% CI=1.3, 2.6) and almost three times more likely to have used dental care in the past five years than Cuban-Americans with a low acculturation status (OR=2.7; 95% CI=1.2, 6.0). Puerto Ricans with high acculturation status were 20 percent more likely to have used dental care in the past two years than Puerto Ricans with a low acculturation status (OR=1.2; 95% CI=1.1, 1.4) and almost 2 times more likely to have used dental care in the past five years than Cuban-Americans with a low acculturation status (OR=1.8; 95% CI=1.2, 2.7).

Discussion

Our multivariable findings dealing with the Mexican-American sample of HHANES appear to support the work of Ismail and Szpunar (12), who found that compared to highly acculturated Mexican-Americans, a larger percent of Mexican-Americans with low acculturation had an interval of two or more years since their last dental visit. Our study found acculturation among Mexican-Americans to be a significant predictor of use of dental services in the past five years, with bilingual or highly acculturated Mexican-Americans 30 percent more likely to have used dental services in the past five years (OR=1.3; 95% CI 1.1, 1.6) even after controlling for covariables such as age, education, and dental insurance. Ismail and Szpunar (12) found that the association between acculturation status and mean numbers of decayed tooth surfaces and missing teeth disappeared after adjusting for income and education. In our study, dental care use in the past two or five years was associated with acculturation even after adjusting for income and education.

Analysis of Hispanic subgroups in relation to oral health provides another level for understanding differences in access and utilization. Although the HHANES data were collected in the 1980s, they are still important and useful. In particular, the dataset provides comprehensive oral health information on the three major Hispanic ethnic groups in the United States, and it includes all age groups. Moreover, the HHANES is the only existing large data set with oral health and dental utilization measures of various Hispanic ethnic groups.

The limitations of using the HHANES data for this study are the subjects with missing acculturation data in the dataset, and the cross-sectional observations of the HHANES data. A comparison of those individuals missing acculturation data with those individuals having acculturation data indicated that those missing data appeared to have characteristics that would imply they were less likely to seek out health services. Therefore, the association between dental service use and acculturation would have been more robust had the missing data been available. Finally, it should be emphasized that HHANES is a cross-sectional study and thus provides limited inference regarding cause and effect.

For all three subgroups, education and dental insurance had an association with utilization of dental services. The effect of acculturation—based on language use, proficiency, and preference—on access to and utilization of any dental services was significant for all three samples, but was not predictive of dental cleaning.

Our findings on acculturation in the Mexican-American sample are consistent with those of Wells et al. (37). In a study of how acculturation affected

TABLE 4
Factors Influencing Dental Care Service Use Among Mexican-Americans (*n*=2,935), Cuban-Americans (*n*=578), and Puerto Ricans (*n*=1,070) in the HHANES*

	Teeth Cleaned <2 Years† OR (95% CI)	Teeth Cleaned <5 Years† OR (95% CI)	Dental Care <2 Years OR (95% CI)	Dental Care <5 Years OR (95% CI)
Mexican-Americans				
Acculturation				
Low	1.0	1.0	1.0	1.0
Bicultural or high	0.9 (0.7, 1.0)	1.0 (0.8, 1.2)	1.2 (1.0, 1.4)	1.3 (1.1, 1.6)
Education				
Less than high school	1.0	1.0	1.0	1.0
High school/equivalent	1.4 (1.2, 1.5)	1.6 (1.2, 2.2)	1.5 (1.2, 1.8)	1.9 (1.6, 2.3)
More than high school	2.0 (1.6, 2.4)	3.3 (2.0, 5.2)	1.9 (1.5, 2.6)	3.1 (2.0, 4.8)
Dental insurance				
No	1.0	1.0	1.0	1.0
Yes	2.4 (2.1, 2.7)	2.7 (2.2, 3.4)	2.2 (1.9, 2.6)	2.3 (1.8, 3.0)
Self-reported condition of teeth				
Fair to poor	1.0	1.0	1.0	1.0
Good to excellent	0.8 (0.7, 0.9)	0.9 (0.7, 1.0)	0.9 (0.8, 1.0)	1.2 (1.0, 1.5)
Self-reported condition of gums				
Fair to poor	1.0	1.0	1.0	1.0
Good to excellent	1.2 (1.0, 1.4)	1.4 (1.1, 1.7)	0.8 (0.7, 1.0)	1.0 (0.8, 1.2)
Cuban-Americans				
Acculturation				
Low	1.0	1.0	1.0	1.0
Bicultural or high	1.3 (0.8, 2.1)	1.2 (0.6, 2.3)	1.8 (1.3, 2.6)	2.7 (1.2, 6.0)
Education				
Less than high school	1.0	1.0	1.0	1.0
High school/equivalent	2.3 (1.4, 3.7)	2.7 (1.3, 5.4)	1.5 (1.1, 2.0)	1.5 (0.8, 2.5)
More than high school	1.8 (1.1, 3.1)	2.8 (1.2, 6.6)	1.2 (0.9, 1.7)	1.4 (0.6, 2.9)
Dental insurance				
No	1.0	1.0	1.0	1.0
Yes	1.7 (1.2, 2.4)	2.4 (1.6, 3.6)	1.3 (0.9, 2.1)	1.4 (1.0, 2.0)
Self-reported condition of teeth				
Fair to poor	1.0	1.0	1.0	1.0
Good to excellent	0.9 (0.6, 1.3)	2.4 (1.6, 3.6)	1.0 (0.6, 1.4)	0.9 (0.6, 1.3)
Self-reported condition of gums				
Fair to poor	1.0	1.0	1.0	1.0
Good to excellent	1.2 (0.7, 1.8)	0.9 (0.6, 1.6)	1.4 (0.8, 2.3)	3.7 (2.0, 7.0)
Puerto Ricans				
Acculturation				
Low	1.0	1.0	1.0	1.0
Bicultural or high	1.1 (0.8, 1.4)	1.4 (0.9, 2.3)	1.2 (1.1, 1.4)	1.8 (1.2, 2.7)
Education				
Less than high school	1.0	1.0	1.0	1.0
High school/equivalent	1.1 (0.8, 1.4)	1.4 (1.0, 1.9)	1.1 (0.9, 1.3)	1.7 (1.1, 2.4)
More than high school	1.8 (1.4, 2.3)	2.0 (1.3, 3.1)	1.9 (1.5, 2.5)	2.3 (1.7, 3.1)
Dental insurance				
No	1.0	1.0	1.0	1.0
Yes	2.4 (1.8, 3.2)	2.4 (1.6, 3.5)	2.0 (1.7, 2.5)	2.2 (1.3, 3.6)
Self-reported condition of teeth				
Fair to poor	1.0	1.0	1.0	1.0
Good to excellent	0.8 (0.6, 0.9)	0.9 (0.8, 1.1)	0.9 (0.7, 1.1)	1.2 (1.0, 1.6)
Self-reported condition of gums				
Fair to poor	1.0	1.0	1.0	1.0
Good to excellent	1.5 (1.2, 2.1)	1.9 (1.4, 2.8)	1.5 (1.2, 1.9)	1.7 (1.1, 2.6)

*Ethnicity, acculturation, dental insurance status, self-reported condition of teeth, and self-reported condition of gums are covariates in each logistic regression model. Reduced sample sizes are because of missing data.
†Edentulous persons excluded from analyses.

the probability that Mexican-Americans used health and social services, after controlling for SES, health status, and insurance coverage, those who were less acculturated were found to have had significantly lower probabilities of outpatient medical visits than those with higher acculturation.

Future research is needed to determine how acculturation fits into the access-to-care puzzle (38) for Hispanics, particularly on how language poses a barrier to dental care services. Acculturation may be a nonsignificant factor in utilization of dental services if less acculturated individuals have access to Spanish-speaking or same-culture dentists in their geographic areas.

Mexican-Americans had the least access to and utilization of dental care overall, despite having higher levels of acculturation than either Cuban-Americans or Puerto Ricans. In contrast, Cuban-Americans had the lowest acculturation levels and least dental insurance coverage yet reported utilizing dental services more recently than Mexican-Americans. Cuban-Americans had the fewest decayed teeth but the most permanent teeth missing due to caries and the fewest permanent teeth present. This clinical finding may reflect the personal value placed on retention of teeth or a financial decision influenced by the lack of dental insurance. Cuban-Americans' positive perception of periodontal health was accurately reflected in their evaluated oral health, as they had the lowest prevalence of periodontal disease. They also most frequently reported preventive services as the reason for last dental visit. Cuban-Americans also had the highest proportion of subjects with annual incomes over $20,000. One explanation for the low acculturation effect is that the Cuban-Americans in Dade County may have had access to culturally competent dentists of their same ethnic group or dentists who spoke Spanish; thus, acculturation, based on language, was not a factor in utilization. Utilization of dental services by Puerto Ricans from the greater New York City area appeared to be most affected by dental insurance status.

The perception of oral health and its relationship to accessing dental care varied for self-reported condition of teeth versus self-reported condition of gums. Overall, subjects who reported their teeth to be in good to excellent condition were less likely to have used dental services than those who reported poor condition of teeth, but these findings were not significant. In contrast, those who reported the condition of their gums as good to excellent were more likely to have accessed care than those who reported poor gum health. Since the models are adjusted for important confounders, it seems that a perception of "good teeth" resulted in decreased use of dental services, while a perception of "good gums" resulted in more utilization of services. Perhaps laypersons can more easily self-identify problems with their gums (e.g., bleeding) than they can caries in early stages of disease.

The Office of Minority Health report "Assuring Cultural Competence in Health Care" (20) addresses the need for accurate demographic, cultural, epidemiologic, and clinical outcome data for racial and ethnic groups in a particular service area. This recommendation indicates the need to develop community profiles and needs assessment. In the current study, education, insurance, and to a lesser extent acculturation and perceived periodontal health had effects on utilization of services for each ethnic group. However, the generalization of findings to all communities of minorities is unlikely to provide viable solutions for each community. Our study findings lend support to this recommendation. The three Hispanic ethnic groups had differences in oral health status, service use, and related factors, but were from three different community profiles and had different ethnic histories. Cuban-Americans in Dade County and Puerto Ricans in New York City, as compared to Mexican-Americans in the Southwest, may have had access to culturally competent bilingual or Spanish-speaking dentists in the community that attenuated the effect of the patient's language or acculturation level on use of services. The role of the community in improving access to and use of dental care should be explored further. It may be that if there are culturally competent health care providers in the community, the acculturation of the patient population is less critical to accessing care.

The Surgeon General's report "Oral Health in America" (1) calls for more information to eliminate health disparities and emphasizes the inadequacy of data needed for research and policy development. Programs that aim to reduce oral health disparities in Hispanic populations and any new data collection efforts should recognize differences among subgroups that may influence utilization of dental services. The interaction of socioeconomic factors, acculturation, and community setting should be considered in studies of dental care access and utilization for Hispanic populations.

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