

Source: Journal of Dental Hygiene, Vol. 82, No. 2, April 2008

Copyright by the American Dental Hygienists' Association

Survey of Oral Health Practices among Adults in a North Carolina Hispanic Population

Mariola Luciano, RDH, MS, Vickie P Overman, RDH, MEd, Pamela Y Frasier, MSPH, PhD and Enrique Platin, MS, EdD

Mariola Luciano, RDH, MS, private practitioner, Cary, NC; Vickie P. Overman, RDH, MEd, clinical associate professor, Dental Hygiene; Pamela Y. Frasier, MSPH, PhD, research associate professor, Family Medicine; Enrique Platin, MS, EdD, clinical associate professor, Diagnostic Sciences and General Dentistry. Overman, Frasier, and Platin are all from the University of North Carolina at Chapel Hill. Mariola Luciano was a Master of Science degree candidate at the time of this research. This project served to meet partial fulfillment of the Master of Science degree in Dental Hygiene Education at the University of North Carolina School of Dentistry.

Purpose. *The purpose of this study was to collect baseline data pertaining to the oral health of Hispanics residing in Siler City, NC, a microcosm of the flourishing Latino growth found especially in the southeastern United States.*

Methods. *A convenience sample of 158 Hispanic adults was recruited. A 41-item Spanish language survey was utilized. Questions addressed preventive oral health practices, oral health knowledge and beliefs, perceived needs, and demographic information.*

Results. *Analysis of data were conducted to find demographic characteristics, frequencies, and correlations. The following associations were found statistically significant ($p < .05$): (1) brushing frequency and belief that healthy gums bleed; (2) dental insurance and frequency of dental visits; (3) source of oral hygiene instruction and participant's reported brushing or flossing, and dental visit frequency.*

Conclusions. *This exploratory study found that this population lacks knowledge related to oral health and that they have indicated an overwhelming need for preventive dental prophylaxis. Characteristics found in this population were low income, low education, no dental insurance, and not speaking fluent English. The following suggestions may aid in eliminating dental health care disparities among this population: 1) training and recruiting oral health care providers that are culturally sensitive and speak Spanish; 2) conducting oral health promotional programs sensitive to the needs of Hispanics; 3) Dental Hygiene programs should expand clinical rotations to provide culturally diverse dental hygiene services; 4) changes should be made in North Carolina dental hygiene practice laws to increase care to underserved population.*

Keywords: Oral Health Practices, Oral Health Beliefs, Hispanics, Dental Hygiene

Introduction

According to the US Census Bureau, North Carolina is one of the leaders in Hispanic population growth. Between 1990 and 2000, North Carolina experienced a 394% increase in its Hispanic population.¹ As an example, the small town of Siler City, NC had a Hispanic population growth from 4% in 1990 to 39% in 2000.² The increased employment of immigrant

workers by the city's poultry processing and textile industries contributed to this growth. Siler City's Hispanic population is mostly comprised of immigrants of Mexican origin. However, there are others from the Caribbean, Central America, or South America.³

The increase in the Hispanic population has led to an increase in oral health needs. However, there are only 4 licensed dentists practicing in Siler City. None are of Hispanic origin and none speak Spanish. A new clinic opened in 2005 with a bilingual (English to Spanish) interpreter, yet private pay patients are required to pay fees for all dental services at the time of the visit. The only other service for Hispanics is a dental bus, accessible 1 to 2 times each month, and sponsored by Chatham Hospital's Immigrant Health Initiative and the North Carolina Baptist Men's Association.

Due to limited access to dentists, oral care for this primarily immigrant Hispanic population is a significant challenge. In 2000, the US Surgeon General reported that oral health was essential to general health and well-being. He referred to oral diseases as the "silent epidemic" affecting the most vulnerable citizens, including members of racial and ethnic minority groups.⁴

Minimal information exists for the planning and provision of oral health services to the Siler City Hispanic population. A greater understanding of preventive oral health practices and beliefs regarding oral health among Latinos is imperative in order to appropriately target prevention interventions that are to be developed. Once more knowledge is attained in relation to the oral health habits present in this population, public health initiatives can be taken in order to provide oral health education and preventive services that best fit the needs of this particular population. Therefore, studies are needed to identify the oral health needs of this population. The purpose of this study is to collect baseline oral health data of Hispanics residing in Siler City, NC.

Review of the Literature

Demographics

The Latino population is the fastest growing minority group in the United States. In 2004, the United States Hispanic population was estimated at approximately 40 million people, comprising 14% of the total US population.⁵ As growth continues, the Pew Hispanic Center estimates that by the year 2020, the Latino population will reach about 60 million.⁶ Not only have the number of Hispanic immigrants increased, but also a younger Hispanic population is attracted to the United States; their mean age of 25 years.⁶ Between 1990 and 2000, the strong economy and added job opportunities in the South stimulated strong immigration. With the exception of Nevada in the southwest, North Carolina, Arkansas, Georgia, Tennessee, South Carolina, and Alabama experienced the highest rate of growth. Because of the strong explosive immigration, these 6 Southern states are deemed new Southern Hispanic settlement states.¹

North Carolina Demographics

In particular, North Carolina experienced substantial growth. The Hispanic population in North Carolina grew from 76 726 in 1990 to 378 963 in 2000.¹ The majority (65%) of the North Carolina Hispanic population is of Mexican origin, but many others are from the Caribbean, Central America, or South America.³ Over half (57%) of the Latinos in the new settlement of the South are foreign born. More specifically, approximately 64% of North Carolina Hispanics are foreign born.³ Evidence shows that foreign-born Latinos earn the least of all workers in the labor force; one reason offered is their lower level of education. As a whole, 42% of Hispanics in the United States have less than a high school education.⁵

Currently, 23% of the United States Latinos live below the poverty level.⁶ Findings show the median weekly earnings for Latinos is approximately \$375 for foreign born and \$425 for native born.⁶ Hispanic growth has had a major impact on specific areas of North Carolina. For example, Siler City, a town located within Chatham County in central North Carolina, has a Latino population (2740) that accounts for 39% of the total town's population.² New health care challenges, including oral health care challenges, have resulted.

The Health Belief Model

The Health Belief Model describes that individuals will perform preventive practices in order to deflect disease if they deem themselves susceptible to the condition, if they consider it to have potentially serious consequences, and if they believe that the preventive practice will be beneficial in reducing their susceptibility to or severity of the condition.⁷ Most important, individuals must believe that the anticipated barriers to practicing these preventive practices are outweighed by the benefits.⁷ However, there are demographic, psychosocial, and structural variables that may influence these preventive health behaviors.⁷ In order for behavioral change to succeed, individuals must believe that changing their current behavior will result in a valued outcome at an acceptable cost. Also, individuals must feel competent to overcome perceived barriers that may present themselves in order to take action.⁷

Use of Dental Services Perceived Need

It has become increasingly important for oral health care providers to understand the factors that affect the utilization and access to dental services by this growing Hispanic population. To begin, one must understand the trends in the use of dental services and the perceived needs of Latinos in the United States. Studies show that Hispanics are more likely to seek dental attention in response to pain rather than for purposes of prevention.⁸⁻¹³

A 2002 study examined the use of dental services among a Hispanic population of migrant farm workers in rural southern Illinois.¹³ The study consisted of a 26-item survey of 119 patients from a local health clinic. About 51% had not sought oral health care in the previous year.¹³ Once again confirming previous studies, the majority of migrant farm workers claimed that the lack of pain and discomfort was the reason for not seeking dental care. Other reasons included lack of time, costly fees, and lack of access to available facilities.¹³ A similar study was performed in Wichita, Kan using a convenience sample of 75 Hispanic adults.⁸ Study participants were asked their reason for not having been to a dentist. Twenty percent perceived no need for oral health care, and 23% reported the inability to find a dentist.

Perceived Dental Needs

In 1995 Watson and Brown gathered information on oral health from the 1985-1986 National Survey of Oral Health in US Adults and Seniors conducted by the Institute of Dental Research. Though data has concluded that 60% of Hispanics reported perceived dental needs, the rate of dental visits appeared to be lowest, with approximately 40% having visited the dentist during the previous year.^{10,14,15} Their rate of dental visits was 20% less than that of Caucasians.¹⁴ In addition, data revealed that fewer Hispanics received oral examinations or cleanings while more received emergency care.¹⁴ There were strong ethnic and racial differences in receipt of dental care with adult Hispanics having the highest percentage of never visiting a dentist.^{10,12,14,15}

Overall, utilization and perceived need in relation to oral health is low among Hispanics.¹⁶ Though oral health disparities among Latinos should lead to increased utilization, this has not been the case.¹⁵ The aforementioned studies provide supporting evidence that the percentage of adults having never sought dental care is disproportionately higher among minorities, especially Mexican-Americans.^{10-13,15} Previous research also shows differences in perceived oral health among ethnic minorities, including Hispanics. Ethnic minorities are more likely to report a more negative oral health status.¹⁷ This leads to concerns regarding the oral health status of Hispanics residing in the United States and their self-care oral health practices.

Oral Health Status and Practices

National Studies indicate Latinos have higher levels of both dental caries and periodontal disease.^{14,16} The Lukes and Miller study surveying 119 migrant farm workers in Illinois found that though most individuals brushed at least daily, only 11% used floss daily, and over half had never used floss at all. Of those receiving care, 58% had received brushing instructions and 45% had received flossing instructions. Approximately 50% of those receiving care reported bleeding gingiva, 37%

reported swollen or tender gingiva, and 49% reported tooth loss. Thus, the study concluded that nearly half might have periodontal disease.¹³ Similarly, the Vazquez and Swan study using a convenience sample of 75 adult Hispanics found that 85% of respondents brushed their teeth at least once daily. Although 30% reported never flossing, another 38% reported using a toothpick for interdental cleansing.⁸

Data from the 1982-1984 Hispanic Health and Nutrition Examination Survey determined that about 46% of Mexican-Americans had gingivitis in comparison to about 8% of the general population.¹⁵ Findings revealed that over 75% of all Hispanic subgroups presented with gingivitis.¹² Less than 4% of all subgroups reported periodontitis as the main reason for their last dental visit.¹² Additionally, more current data comparing the National Health and Nutrition Examination Survey III and National Health and Nutrition Examination Survey 1999-2000, characterized Mexican-Americans as exhibiting worse clinical periodontal conditions than non-Hispanic whites.¹⁸

Findings from Nakazono et al study reveals that increased oral hygiene practices result in lower unmet treatment needs. This demonstrates the importance of oral hygiene practices.¹⁹ However, there are certain behavioral components related to preventive oral health practices that must also be examined. These include knowledge, beliefs, and barriers related to utilization of dental services and oral health practices.

Beliefs and Knowledge of Oral Health and Preventive Practices

The Woolfolk et al study assessed oral health knowledge among a group of migrant worker mothers. Half of the mothers reported that their gums bled. However, few of these women knew what should or could be done about the condition. This same study found women lacking in knowledge about the relationship between oral hygiene and periodontal health.²⁰

A study by Adair et al in 2004 examined oral health beliefs among diverse populations, finding that Hispanic adults expressed a more negative belief about the benefit of preventive oral health practices.²¹ A similar study conducted on familial and cultural perceptions and beliefs of oral hygiene examined the extent of parental attitudes of oral hygiene practices and the prediction of similar behaviors in their children. This study found that, although Mexican-Americans were very positive about the value of tooth brushing, they were less likely to believe in their ability to implement tooth brushing behaviors.²²

Barriers

The dental health status and the use of dental services are imperative factors that need to be taken into consideration when dealing with oral health among the Hispanic population. Barriers and attitudes affecting access to oral health care within minority populations include: educational level coupled with cultural values and beliefs, language, lack of access to service, low income, lack of dental insurance, lack of recognition of oral health care, acculturation, and inaccessibility to health professionals of the same ethnicity.⁸ The most obvious barrier is assumed to be language. Despite the considerable growth of Hispanics in the US population, very few health care providers speak Spanish.⁸ This alone makes it very difficult for Hispanics to maneuver themselves through the US health care system. Language barriers also make it impossible for individuals to establish ongoing health care relationships with their providers.

Acculturation

Acculturation is most often defined as the process of adapting to a new culture; this is most often measured as the changes produced in language.²³ In 1995, Watson and Brown made an observation on access to care based on acculturation from the 1982-1984 Hispanic Health and Nutrition Examination Survey.¹⁴ Watson and Brown found that Mexican-Americans with low acculturation status in the United States had minimal access to care regardless of their needs. They felt that this was due to the differences between the patients' and providers' culture and language. These 2 differences between the patient and provider are important contributing factors when dealing with the lack of preventive care among the Hispanic populace.¹⁴

A study by Vazquez and Swan found that 41% of Hispanics who spoke English fluently had dental insurance and 53% had a regular place for oral health care. These individuals also showed trends in less time since their last dental visit and dental examinations, and more frequent health care visits.⁸

Ismail and Szupunar conducted a study accounting for acculturation. The study concluded that Mexican-Americans with low acculturation had notably higher mean plaque and calculus index scores.⁹ Results revealed that those with low acculturation status had a higher occurrence of both gingivitis and periodontal pocketing.⁹ Ismail and Szupunar also concluded that those with low acculturation status (17%) were less likely to be covered by dental insurance than those with a higher acculturation status (44%). Further, about 25% of the low acculturated individuals had never been to the dentist compared to about 6% of those with a high acculturation status. Through further examination, Ismail and Szupunar established that those with low acculturation sought dental care for toothaches and extractions more frequently rather than for preventive measures.^{9,10}

The Cost of Care

The cost of dental care alone is a great barrier to the Hispanic population.⁸ National data shows Hispanics, most specifically Mexican-Americans, having low education and income levels.^{14, 15} Thirty-eight percent of Hispanics were in the lowest annual income bracket of \$12 499 or less and over half (52%) did not have dental insurance.¹⁴ Another survey found that 41% of Mexican-Americans were uninsured, which makes them the highest proportion of uninsured persons in the United States. This investigation indicated that Hispanic adults are more likely to lack access to preventive care. However, findings reveal that privately insured Hispanics do not differ extensively in the utilization of preventive dental services. Publicly-insured individuals were drastically less likely to use dental recalls.¹⁵ Doty and Weech-Maldonado theorized that this was due to a combination of differential treatment and differential use of benefits. Differential treatment may be received due to geographic differences in Medicaid benefits. In 2003, 8 states did not cover adult dental services, and Medicaid benefits vary from state to state. Inadequate dentist participation in the Medicaid program may be a factor affecting treatment as a result of the low reimbursement rates.¹⁵ Differential use of benefits may be due to the lack of acculturation and the increased language barrier present among the publicly=insured Hispanic population. Another factor affecting differential use of service may include dissimilar beliefs about dental care, which in turn affects the pattern of use, and the value placed on preventive dental care among Latinos. Doty and Weech-Maldonado found that enabling resources are important in estimating preventive dental care utilization among minorities. They believe that by reducing discrepancies in insurance participation, access to preventive dental care can be enhanced.¹⁵

An aforementioned study conducted with a group of Hispanics in Kansas found that 75% of participants lacked dental insurance.⁸ Overall, insured individuals averaged less time since their last dental visit and increased the amount of annual dental visits.⁸ Confirming earlier findings, the presence or lack of dental insurance greatly affects utilization by the Hispanic community. This same study examined that education beyond high school predicted more dental visits, fewer months since the prior dental exam, and greater frequency of oral care. Those with a higher education level perceived their dental health status as superior, recognized greater oral health needs, and were less likely to delay seeking care.⁸ Data shows that Mexican-Americans with less than a high school education have a higher prevalence of periodontal disease.²⁴ Overall, data has revealed education, dental insurance, and acculturation as the important predictors of dental care utilization.¹²

Research Agenda for Latino Oral Health

In 2004, the Hispanic Dental Association and the University of Puerto Rico met in order to develop an agenda for future Latino oral health research. Though national surveys provide important data about health issues among Hispanics, this data only provides a macro view of the Hispanic population within the United States.²³ The only published national survey to date focusing on Latino health issues was the 1982-1984 Hispanic Health and Nutrition Survey. Though this study provided an abundance of information about Latinos, the study was conducted when the number of Hispanics in the United States was dramatically lower.²³ This is why Ramos-Gomez et al suggest that more data is needed analyzing the US Latino

population. This study proposes population-based, social and behavioral sciences, and health promotion and communications studies as urgent priorities within Hispanic research.²³ This proposal supports the research agenda of the American Dental Hygienists' Association, which states that studies should be conducted on the preventive oral health behaviors of diverse populations.²⁵ Such research may aid in the plan for the elimination of oral health disparities as suggested by the 2000 Surgeon General's Report on Oral Health.⁴

Methods and Materials

A descriptive questionnaire research design was utilized. The primary investigator, a native Spanish speaker, drafted the questionnaire in English, and translated it into Spanish. It was pretested using bilingual allied dental professionals from a local Hispanic dental practice. Allied dental professionals represented Mexico, Venezuela, and Colombia. The primary investigator incorporated suggested changes, adjusting for differences in dialects. The thesis committee reviewed the questionnaire and recommended final changes. The Institutional Review Board of the University of North Carolina reviewed and approved the survey instrument in August 2005. In order to aid in the minimization of misinterpretation by study participants, a pilot questionnaire was administered. Five individuals, from the community where the questionnaire was ultimately carried out, were recruited from patients visiting a local dental bus. After completing the questionnaire, patients provided written feedback on the questionnaire length, the clarity of the questions, and the amount of time needed for questionnaire completion. No further changes to the 41-item questionnaire were suggested.

The questionnaire was divided into 6 sections: dental health care habits, dental visits, condition of gums, knowledge and beliefs about periodontitis, concerns about teeth and gums, and demographic information. Sections pertaining to dental health care habits, dental visits, and condition of gingiva included multiple-choice questions. In the section pertaining to dental visits, respondents were asked to choose all that applied for the reason of their last dental visit. Therefore, more than one response could have been chosen for this question. Similarly, participants were asked to select the common signs of periodontal disease; once again, participants were asked to circle all that applied. The questions related to oral health beliefs utilized 6 Likert-type questions. For example, "I should only visit the dentist if I am in pain." Participants were asked to choose a response from a 5-point Likert-type scale: strongly agree, agree, not certain, disagree, or strongly disagree. The demographic information section included gender, age, income, education, country of origin, length of residence in the United States, and whether or not the respondents had dental insurance. The last section of the questionnaire asked participants to choose all of their perceived dental needs from the following procedures: do not need dental treatment, tooth that hurts, dental check-up, cleaning, tooth pulled, treatment for gum disease, broken tooth, teeth straightened, sores, fill in gaps between teeth, all teeth pulled, gold removed, dentures, and other.

Prior to survey implementation, Lay Health Advisors from Chatham Hospital's Immigrant Health Initiative and volunteers from Santa Julia Catholic Church were calibrated to the prescribed procedures for administering a questionnaire as it relates to human research issues. This was accomplished in Spanish by the principle investigator. This training was previously utilized by researchers at the University of North Carolina School of Public Health with a similar group of lay health advisors. Following the training session, all recruiters were required to obtain a score of 80 or better on the posttest.

For the study, inclusion criteria included male or female Hispanic individuals between 18 and 64 years of age. Exclusion criteria included those of non-Hispanic origins and individuals younger than 18 years of age and older than 64 years of age. The convenience sample approached 5% of Siler City's total Hispanic population.

Questionnaires were completed following 2 Sunday worship services on September 25, 2005, at Santa Julia Catholic Church in Siler City, NC. Individuals attending Sunday worship had equal opportunity to participate voluntarily in the study. Consent to participate was implied by the participant's completion of the 15-minute questionnaire. No identifying markers were included in the questionnaire; it was completely anonymous. The primary investigator was present during the questionnaire completion in order to ensure the integrity of the project. The majority of individuals completed the questionnaire independently. Lay health advisors were available to assist those who asked for help and those requiring assistance reading the survey. After completion of the questionnaire, respondents were offered oral health literature, oral physiotherapy aids, and a telephone calling card.

Following data collection, questionnaires were numbered for ease in data entry. Data from the questionnaires were manually entered into a Microsoft Excel Spreadsheet. At the completion of data entry, all questionnaires were reviewed for verification. Data was analyzed using SAS version 9. Frequencies and bivariate analyses were obtained from the data.

Results

A total of 158 questionnaires were collected. Five were excluded from analysis; four respondents did not meet the age criteria and one did not meet the criteria of Hispanic ethnicity. Therefore, a total of 153 questionnaires were analyzed.

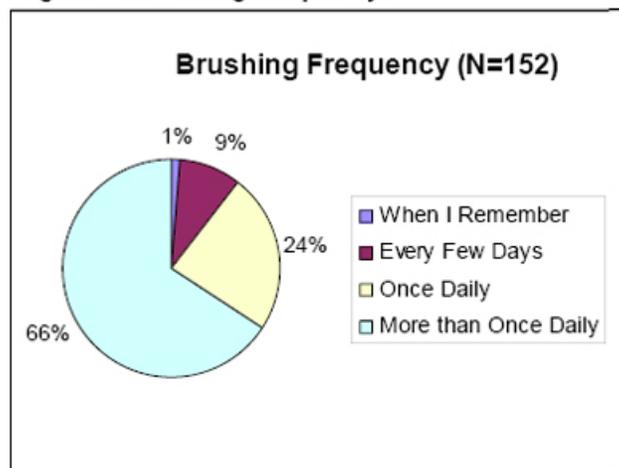
Demographics

Slightly more than half (54%) of the respondents were female. The mean age was 33.8, with a range from 18 to 62 years of age. High proportions (84%) of respondents were of North American Hispanic origin (Mexican), with 15% having a Central American origin, and less than 1% having a South American origin. The mean time of residence in the United States was 106.⁸ months with a range from 2 to 492 months. Approximately 80% of the respondents reported their weekly income, with a majority of individuals reporting \$201-\$400 weekly. In addition, respondents were asked to record their highest level of school completed. Educational categories included none, primary, secondary, preparatory (private high school), and higher education. The majority of individuals responded to having either a primary, secondary or preparatory education. A minority (3%) of questionnaire participants had no educational background and a few (7%) had some type of higher education. Furthermore, a majority (71%) reported having no dental insurance. About 4% did not know their dental insurance status.

Dental Health Care Habits

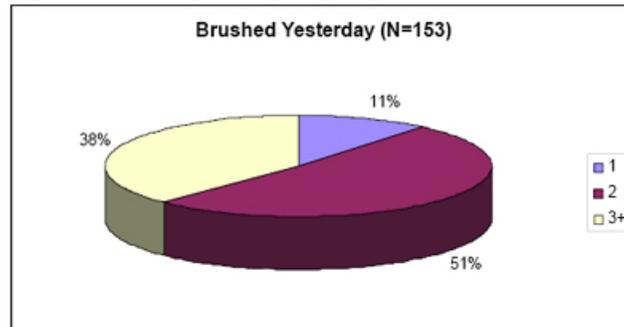
As stated in the Methods section, 3 questions pertained to tooth brushing habits. The first question asked individuals how often they brushed their teeth. Figure 1 indicates that about 66% reported brushing more than once daily, with about half brushing 2 times daily. Fifty-one percent of individuals reported having brushed 2 times "yesterday" (Figure 2). When asked who taught them how to brush their teeth correctly, participants were required to choose only one response. Survey participant responses were divided into 4 categories: no one/myself, family member, professional (teacher, dentist, dental hygienist, dental worker), and other. A large number of individuals (46%) reported having been taught by a family member.

Figure 1: Brushing Frequency



-Percentages were rounded to whole decimal place

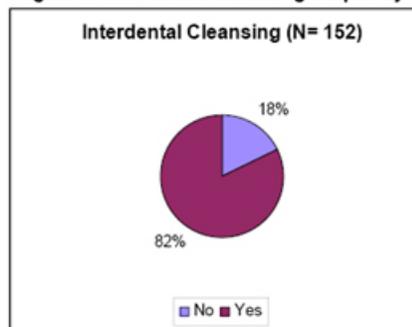
Figure 2: Brushed yesterday frequency



- Percentages were rounded to whole decimal place

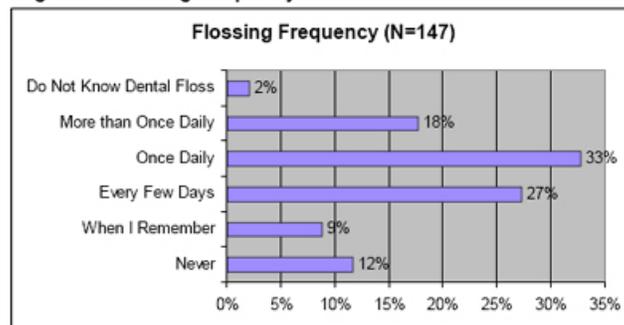
Five questions dealt with dental flossing. First, participants were asked whether or not they cleansed between their teeth. Approximately 125 participants (82%) responded "yes" to interdental cleansing (Figure 3). Those responding "yes" were then asked to answer 4 additional questions about flossing frequency (Figure 4). When asked to indicate the number of times individuals flossed "yesterday", forty-six percent responded 1-2 times (Figure 5). Additionally, the questionnaire asked for the number of times individuals flossed "normally." The majority (62%) responded 1-2 times daily (Figure 6). Moreover, individuals were asked who taught them how to properly floss their teeth; 42% had never received flossing instruction.

Figure 3: Interdental cleansing frequency



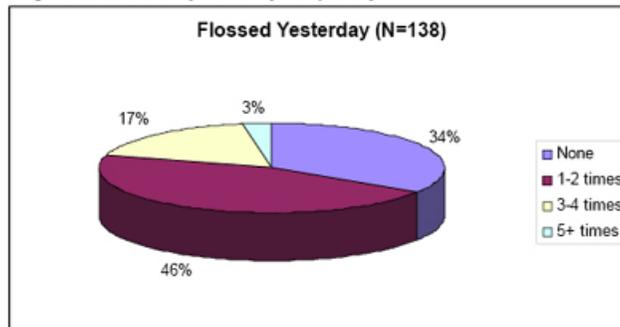
-Percentages were rounded to whole decimal place

Figure 4: Flossing Frequency



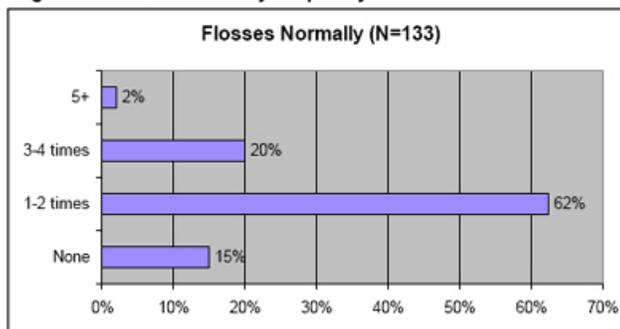
-Percentages were rounded to whole decimal place

Figure 5: Flossed yesterday frequency



-Percentages were rounded to whole decimal place

Figure 6: Flosses normally frequency

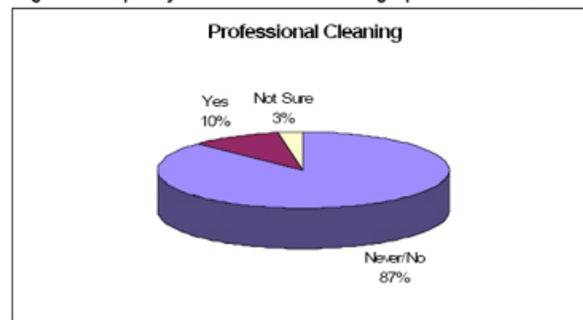


-Percentages were rounded to whole decimal place

Dental Visits

The survey included 3 questions related to dental visits. Participants were first asked if they had ever had a professional cleaning conducted by a dental hygienist or a dentist. Approximately 87% reported "no" or "never" (Figure 7). Participants were then asked to recall their last dental visit. Less than half (42%) responded that they had visited a dentist within the last year; about 19% responded it had been at least 2 years since their last dental visit. Approximately 7% reported 3-4 years since their last dental visit; about 11% responded "greater than 5 years," 11% responded "never;" and about 9% reported they "did not remember." Finally, respondents were asked the reason for their last dental visit; 39% stated their last dental visit was for a cleaning.

Figure 7: Frequency of individuals ever having a professional dental cleaning



Gingival Condition

When participants were asked whether their gums bled when they brushed or flossed their teeth, more than half of the participants (52%) indicated bleeding.

Knowledge and Beliefs

Respondents were asked to identify the common sign of gums disease, choosing all that applied: swollen, inflamed, or bleeding gums; continual bad breath; loose teeth; gums that are pulling away from the tooth; other; and do not know. Most individuals (66%) responded that swollen, inflamed, or bleeding gums were common signs of gums disease. Twenty-five reported bad breath, 14% reported loose teeth, 5% reported recession, and 1% reported other as common signs of gum disease.

Participants were asked to rank their beliefs about gum disease. About 65% strongly agreed that brushing their teeth could help prevent gum disease. However, less than half (45%) strongly agreed that flossing could also help prevent gum disease. More than half of the respondents (64%) stated that they strongly agreed that it was important to visit the dentist every 6 months. Most individuals either disagreed or strongly disagreed that one should only visit the dentist if in pain. Furthermore, approximately one-third (37%) of individuals stated that they were not certain if healthy gums bled occasionally. In addition, large percentages (41%) were not certain if tooth loss was a normal part of aging (Table 1).

Table 1: Percentage of responses related to beliefs about gum disease

	SA/A	NC	D/SD
Brushing my teeth can help prevent gum problems. (n=145)	89.6	9.7	0.7
Using dental floss helps prevent gum disease. (n=144)	82.6	16.0	1.4
Going to the dentist every six months is important. (n=142)	91.6	8.5	0.0
I should only visit a dentist if I am in pain. (n=136)	11.8	11.8	76.5
It is normal for healthy gums to bleed occasionally. (n=137)	19.7	36.5	43.8
I will lose my teeth as I get older. (n=140)	27.8	41.4	30.7

-SA- Strongly Agree; A- Agree; NC-Not Certain; D- Disagree; SD- Strongly Disagree

Perceived Needs

Respondents were asked to choose all of their perceived dental needs. A majority (72%) chose dental cleaning as a perceived need, followed by dental checkup (37%) and dental filling (32%) (Table 2).

Table 2: Latinos' Perceived Dental Needs By Frequency of Response

(N=148)	%
Dental cleaning	72
Check up	37
Fillings	32
Treatment for gum disease	24
Tooth that hurts	24
Broken tooth	23
Tooth extracted	18
Teeth straightened	17
Gaps filled	14
Other	14
No treatment needed	12
Mouth sores	10
Removal of all gold	5
Dentures	3
All teeth pulled	2

-Respondents reported all that applied

Bivariate Analyses

Bivariate analyses were performed using Mantel-Haenszel correlation tests. Correlations revealed strong evidence of a statistically significant association between who taught individuals how to floss and their flossing frequency (p-value ≤

0.05). In particular, those who were taught how to floss by a family member or a friend had the highest average flossing frequency. Those who were taught to floss by a professional had the second highest average, and those who were never taught or who were self-taught had the lowest average flossing frequency. No evidence indicated statistically significant correlation between brushing frequency and who taught individuals to brush their teeth.

Further, statistically significant correlations were found between who taught individuals how to floss and last dental visit ($p\text{-value} \leq 0.05$). Specifically, those who were taught how to floss by a professional had the least time since their last dental visit. Those who were not taught, self-taught, or taught by a family member or friend had similar average time since their last dental visit, but lower than those taught by a professional.

Furthermore, evidence revealed a statistically significant association between who taught individuals how to brush and their last dental visit ($p\text{-value} \leq 0.05$). Those who were taught how to brush by a professional had the least time since their last dental visit. Those who were not taught, self-taught, or taught by a family member or friend had a similar average of time since their last dental visit, but lower than those taught by a professional.

In addition, a statistically significant association existed between dental insurance and last dental visit ($p\text{-value} \leq 0.05$). Those with dental insurance had significantly less time since their last dental visit. Additionally, evidence of a statistically significant association between brushing frequency and the belief that healthy gums bleed was found ($p\text{-value} \leq 0.05$). A Spearman correlation coefficient of -0.1745 indicates that higher brushing frequencies were associated with higher rates of disagreement that healthy gums bled. There was no evidence of any statistically significant association between floss frequency and knowledge of gum disease. Similarly, no evidence of statistically significant association was found between flossing frequency and familiarity with signs of gum disease. Also, no association was found with flossing frequency and whether or not individual's gingiva bled upon brushing or flossing.

Moreover, associations between last dental visit and self-reported perceived needs were found. Individuals reporting not needing a dental cleaning had less time since their last dental visit in comparison to those who responded needing a dental cleaning ($p\text{-value} \leq 0.05$). No other associations were found.

Discussion

The Hispanic population in Siler City, NC is a microcosm of the Hispanic population in North Carolina, with a majority of Mexican decent, a mean age of about 34 years, low income, and lack of education. The average length of residence in the United States is approximately 9 years. Having lived in the United States only 9 years, these foreign-born individuals may be less acculturated. Therefore, language, health care delivery system, and differing beliefs about prevention are a few of the barriers that prevent these individuals from acquiring proper oral health care. It is important to mention that although other populations experience health disparities, there are differences in access to care among Hispanics because of ineligibility for Medicaid or other state-funded insurance programs due to the legal status of these individuals. Again, 84% of the individuals in this study are of foreign origin, and therefore may not be eligible for Medicaid.

Consistent with other findings, there was a lack of dental insurance within this population. This may lead to low use of dental services due to the high cost of professional oral health care. Once again consistent with previous findings, dental treatment was most often sought for palliative reasons rather than preventive reasons, with a majority of respondents having never had a preventive dental prophylaxis. This could be due to the lack of knowledge about gum disease within this population. In this study, 87% reported never having a professional dental cleaning; however, 39% stated their last dental visit was for a cleaning. This discrepancy may have occurred because individuals sought a professional dental cleaning at one time but due to circumstances were not able to receive that care. It also may be that when individuals visited the oral health care provider, they were overwhelmed with the system and the treatment plans they received, or it may have been due to access to care issues. Though the Siler City population has access to a dental bus that provides limited services, the need is much higher than can be met in a bus that is only available for 1 to 2 days a month. Though many individuals were aware of the cardinal signs of inflammation as being indicators of gingival disease, few were aware of other signs such as: bad breath, recession, or loose teeth. Also, the majority of participants agreed that brushing and

flossing could help prevent gum disease, and that going to the dentist every 6 months is important. However, individuals were less knowledgeable about whether healthy gums bled, or if tooth loss was a normal part of aging. Though over half of respondents reported having bleeding gingiva, providing evidence that these individuals have gingivitis or periodontitis, the majority of respondents reported never having a professional dental cleaning.

Overall, findings from this study suggest that self-reported dental homecare was adequate among this population. About half reported brushing more than once daily and a majority reported interdental cleansing. This is not consistent with national surveys, which reveal that only 40% of the overall US population utilizes dental floss on a regular basis.²⁶ However, there are other modalities of interdental cleansing that could be used, such as toothpicks. It may be that respondents chose a response that was socially acceptable. This is one reason self-reported data should be interpreted cautiously.

Unique to this study, analysis revealed that the source of oral hygiene instruction had an effect on brushing and flossing frequencies and time since last dental visit. More specific, individuals who were taught to floss by a dental professional were more likely to have higher frequencies of home care practices. Also, individuals taught to floss and brush by a dental professional had less time since their last dental visit. This finding has not previously been noted. Furthermore, participants were asked to report their perceived dental needs. This was not a clinical evaluation by a dental professional, but rather self-reported by the individual participants. Therefore, actual treatment needs may differ extensively from the reported ones. However, almost three-fourths reported needing a dental cleaning. Though there is such a high demand for preventive professional cleanings, culturally sensitive services are lacking in Siler City, NC.

This exploratory study had several limitations, including: a small sample size, convenience sample, incomplete surveys, and self-reported data. Further investigations should be made using a much larger sample size. The convenient sample population reached only about 5% of the total Hispanic population of Siler City. Collecting data after Sunday worship services attracted a Hispanic population with mobility; many Hispanics have no transportation and may be isolated. Therefore, this population may have more access to care because they have transportation. Also, many of the respondents did not answer all of the questions; this reduced the effectiveness of the sample. A "gold standard" longitudinal study would provide more valuable data in relation to oral health status and utilization. Further investigations should seek to collect data on actual dental needs rather than self-reported perceived needs. Generalizations are limited to those individuals participating in the study. All data was self-reported, therefore this data should be interpreted carefully. Misinterpretations could have occurred during survey delivery. Though the primary investigator that translated the survey is a native Spanish speaker, participants of the study may have created differing interpretations to the questions. Lay health advisors aiding with the survey implementation were all fluent in Spanish and very familiar with the cultural attributes of the sample population. Lay health advisors only aided those that asked for assistance. However, there could have been variability in the way lay health advisors delivered the survey, which could have lead to differing results.

Conclusions

This exploratory study found that this population lacks knowledge related to oral health. An overwhelming perceived need for preventive dental prophylaxis was reported by participants. Also, low income, low education, no dental insurance, and language are some of the barriers that have been previously found to interfere with individuals seeking dental care. Therefore, the following suggestions are made that may aid in eliminating dental health care disparities among this population. It is important to recruit and train oral health care providers that are culturally sensitive to this population and that can speak Spanish fluently. Dental terminology and oral health needs can be difficult for individuals to understand. Moreover, it makes it much more difficult when the patient and the health care provider speak a different language. Removing the language barrier alone can lead to further education about oral health and its connection to overall health; therefore, decreasing oral health disparities. Extensive oral health promotional programs are needed that are particularly sensitive to the Hispanics of Siler City. It is also important for dental hygiene programs in North Carolina to encourage their dental hygiene students to become more culturally sensitive to the needs of Hispanics in the state. Trends show that the Hispanic population is going to continue to grow extensively. Dental hygiene programs should expand their clinical rotations in order to provide cultural diversity in the curriculum and to serve the underserved Hispanic population of North Carolina. Increasing programs that immerse students into different cultures and clinical practice experiences can motivate them to further seek these opportunities throughout their career.

North Carolina laws do not currently allow dental hygienists to work independently, or without the supervision of a dentist. Changes in these laws, particularly when dealing with underserved populations, could lead to more preventive services being provided and more dental health needs being met.

Notes

Correspondence to: Mariola Luciano, RDH, MS at luciano.mariola@gmail.com.

References

1. The New Latino South: The Context and Consequences of Rapid Population Growth. [homepage on the Internet]. Washington (DC): Pew Hispanic Center.; c2005. [cited 2006 Oct 1]. Available from: <http://pewhispanic.org/>.
2. Census Bureau 2000. [homepage on the Internet]. Washington (DC): U.S. Census Bureau.; c2000. [cited 2006 Oct 1]. Available from: <http://www.census.gov>.
3. NC Latino Health, 2003. [homepage on the Internet]. Durham, (NC): North Carolina Institute of Medicine.; c2003. [cited 2006 Oct 1]. Available from: <http://www.nciom.org/index.html>.
4. U.S. Department of Health and Human Services. Oral Health in America: a report of the Surgeon General. [homepage on the Internet]. Rockville, (MD): National Institute of Dental and Craniofacial Research, National Institute of Health.; c2000. [cited 2006 Oct 1]. Available from: <http://www.surgeongeneral.gov/library/oralhealth/>.
5. U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement. [homepage on the Internet]. Washington, (DC): U.S. Census Bureau, Ethnicity and Ancestry Statistics Branch, Population Division.; c2004. [cited 2006 Oct 1]. Available from: <http://www.census.gov/>.
6. Pew Hispanic Center. Trends 2005: Hispanics: A People in Motion. [homepage on the Internet]. Washington, (DC): Pew Research Center.; c2005. [cited 2006 Oct 1]. Available from: <http://pewhispanic.org/>.
7. Glanz K, Lewis FM, Rimer BK. , editors Health Behavior and Health Education. (2nded). San Francisco (CA): Jossey-Bass Inc; 1997.
8. Vazquez L, Swan JH. Access and attitudes toward oral health care among Hispanics in Wichita, Kansas. *J Dent Hyg.* 2003;77(2): 85-96.
9. Ismail AI, Szpunar SM. Oral health status of Mexican-Americans with low and high acculturation status: findings from southwestern HHANES, 1982-84. *J Public Health Dent.* 1990;50(1): 24-31.
10. Davidson PL, Andersen RM. Determinants of dental care utilization for diverse ethnic and age groups. *Adv Dent Res.* 1997. May;11(2): 254-62.
11. Aday LA, Forthofer RN. A profile of black and Hispanic subgroups' access to dental care: findings from the National Health Interview Survey. *J Public Health Dent.* 1992;52(4): 210-5.
12. Stewart DC, Ortega AN, Dausey D, Rosenheck R. Oral health and use of dental services among Hispanics. *J Public Health Dent.* 2002;62(2): 84-91.
13. Lukes SM, Miller FY. Oral health issues among migrant farmworkers. *J Dent Hyg.* 2002;76(2): 134-40.
14. Watson MR, Brown LJ. The oral health of U.S. Hispanics: evaluating their needs and their use of dental services. *J Am Dent Assoc.* 1995. Jun;126(6): 789-95.
15. Doty HE, Weech-Maldonado R. Racial/ethnic disparities in adult preventive dental care use. *J Health Care Poor Underserved.* 2003. Nov;14(4): 516-34.
16. Ahluwalia KP, Sadowsky D. Oral disease burden and dental services utilization by Latino and African-American seniors in Northern Manhattan. *J Community Health.* 2003. Aug;28(4): 267-80.
17. Atchison KA, Gift HC. Perceived oral health in a diverse sample. *Adv Dent Res.* 1997. May;11(2): 272-80.
18. Borrell LN, Lynch J, Neighbors H, Burt BA, Gillespie BW. Is there homogeneity in periodontal health between African Americans and Mexican Americans?. *Ethn Dis.* 2002;12(1): 97-110.
19. Marcus M, Reifel NM, Nakazono TT. Clinical measures and treatment needs. *Adv Dent Res.* 1997. May;11(2): 263-71.
20. Woolfolk MP, Sgan-Cohen HD, Bagramian RA, Gunn SM. Self-reported health behavior and dental knowledge of a migrant worker population. *Community Dent Oral Epidemiol.* 1985 . June;13(3): 140-2.
21. Nakazono TT, Davidson PL, Andersen RM. Oral health beliefs in diverse populations. *Adv Dent Res.* 1997 . May;11(2): 235-44.
22. Adair PM, Pine CM, Burnside G, Nicoll AD, Gillett A, Anwar S, et al.. Familial and cultural perceptions and beliefs of oral hygiene and dietary practices among ethnically and socio-economically diverse groups. *Community Dent Health.* 2004;21(1 Suppl): 102-11.

23. Ramos-Gomez F, Cruz GD, Watson MR, Canto MT, Boneta AE. Latino oral health: A research agenda toward eliminating oral health disparities. *J Am Dent Assoc.* 2005 . Sep;136(9): 1231-40.
24. Borrell LN, Burt BA, Taylor GW. Prevalence and trends in periodontitis in the USA: from the NHANES III to the NHANES, 1988 to 2000. *J Dent Res.* 2005. Oct;84(10): 924-30.
25. American Dental Hygienists' Association. National Dental Hygiene Research Agenda. Chicago (IL): American Dental Hygienists' Association; 2007.
26. Davidson PL, Rams TE, Andersen RM. Socio-behavioral determinants of oral hygiene practices among USA ethnic and age groups. *Adv Dent Res.* 1997. May;11(2): 245-53.