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Mexican-American mothers' initiation and understanding of home oral hygiene for young children

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Abstract

Purpose—To investigate caregiver beliefs and behaviors as key issues in the initiation of home oral hygiene routines. Oral hygiene helps reduce the prevalence of early childhood caries, which is disproportionately high among Mexican-American children.

Methods—Interviews were conducted with a convenience sample of 48 Mexican-American mothers of young children in a low income, urban neighborhood. Interviews were digitally recorded, translated, transcribed, coded and analyzed using standard qualitative procedures.

Results—The average age of tooth brushing initiation was 1.8±0.8 years; only a small proportion of parents (13%) initiated oral hygiene in accord with American Dental Association (ADA) recommendations. Mothers initiated 2 forms of oral hygiene: infant oral hygiene and regular tooth brushing. For the 48% of children who participated in infant oral hygiene, mothers were prompted by pediatrician and social service (WIC) professionals. For regular tooth brushing initiation, a set of maternal beliefs exist about when this oral hygiene practice becomes necessary for children. Beliefs are mainly based on a child's dental maturity, interest, capacity and age/size.

Conclusions—Most (87%) of the urban Mexican-American mothers in the study do not initiate oral hygiene practices in compliance with ADA recommendations. These findings have implications for educational messages.

Keywords

infant oral health; early childhood caries; tooth brushing; oral habits; Mexican-American children

INTRODUCTION

Studies have long documented the disproportionately high rates of early childhood caries (ECC) among Latino children.[1] Research shows that Mexican-American children have higher rates of decay than school children in the United States (U.S.) generally and in California specifically.[2–5] U.S.-born children of Mexican immigrants experience more decayed primary teeth than do Mexican-American children in general.[6] Much research into the reasons why these children experience such oral health disparities has pointed to barriers

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to access and dental utilization.[7,8] Some research, however, suggests that Mexican immigrant parents might have poor knowledge of effective preventive measures,[9,10] might not understand the relationship between the child's diet and oral disease,[10] or might accord low value to primary teeth.[11] Moreover, parents might not adequately engage their children in oral hygiene routines.[12,13]

Different populations have vastly different rates of tooth brushing for children,[14] ranging from 25% of 1-year-olds in Brazil,[15] to 90% of 1-year-olds in southern England.[16] In the U.S., Douglass and colleagues investigated Arizona preschool children aged 6 to 36 months and found that 63% have their teeth brushed at least once a day.[17] Among Washington State children, 74% of 12–48 month-olds had their teeth brushed daily by an adult.[18] African-American children aged 1–3 years old living in Detroit, Michigan, brushed an average of 8.42 times a week, whereas 4–5-year-olds brushed an average of 9.75 times per week.[19]

Tooth brushing has been inconsistently linked to caries prevalence. Many studies have not found tooth brushing to be significantly related to caries experience.[15,17,20–22] Others have found tooth brushing to be effective in preventing caries[23] under specific conditions, including when used in combination with fluoride toothpaste,[24] initiation by 12 months,[16] older age of child (25 to 36 months),[17] parent assistance, [17] social status,[25] and frequency of brushing more than once a day.[26] Yet other studies have related tooth brushing, under specific conditions, to reduction of other caries risk factors. *Streptococcus mutans* levels were significantly lower among children who had initiated tooth brushing by age 12 months.[16] Plaque levels were found to be significantly lower among children who brushed their teeth, and had mothers that brushed their own teeth frequently.[27] Tooth brushing and wiping of gums and teeth of infants at high risk for early childhood caries have been shown to effectively remove plaque.[28] Santos found quality of oral hygiene, not frequency of brushing, was significantly related to caries incidence.[21]

Factors influencing children's tooth brushing habits have also been studied. Finlayson and colleagues in Detroit, and Mohebbi and colleagues in Tehran, Iran found maternal oral health self-efficacy, mother's knowledge of children's hygiene needs, and whether or not mothers brushed their own teeth, to be significantly related to a child's brushing frequency.[19,27] Mothers may lack knowledge of the professionally recommended routine for children's hygiene. In California, Adams and colleagues found that more than 40% of Latina mothers were not aware of the proper tooth brushing technique, such as brushing for two minutes, the need for parental assistance for children under age 6, and using a pea-size amount of fluoride toothpaste.[29] Cooperation of children during tooth brushing has also been found to be a significant factor in whether and how often children and parents brush teeth.[13,30–32]

Two articles, available only in Japanese, report on the formation of tooth brushing habits in children aged 1 to 6 years. In Nagoya, Japan, Suzuki found 75.5% of children started tooth brushing before 18 months, and 88.3% had started by age 2 years.[31,33] "Eruption of teeth" was the most common reason (49.2%) for initiation of tooth brushing. Tooth brushing habit formation was influenced by the parent's motive for starting brushing, positive attitude towards tooth brushing, child cooperation, average daily frequency of brushing, guidance from the mother about tooth brushing, and guidance from the dentist or dental hygienist.

Compared to children's use of a regular toothbrush, much less has been published on infant oral hygiene. In 1 of few such studies, Chan and colleagues report that 66.2% of preschool children in Hong Kong participate in oral cleansing (such as wiping the mouth with cotton gauze or a handkerchief) with 44.2% of those reporting initiation right after birth.[24]

Although the connection between oral hygiene practices and caries prevalence is not straightforward, nevertheless, most oral health professionals strongly recommend a daily oral hygiene regimen.[34] The American Dental Association (ADA) recommends that parents wipe their baby's gums with a clean gauze pad after each feeding, and initiate tooth brushing with a baby toothbrush when the first tooth erupts, along with a low sugar diet, not sleeping with bottles, and a dental visit by age 1 year with continuous checkups every 6 months thereafter. [34]

Despite its importance as an aspect of maintaining children's oral health, the literature does not contain many reports examining the initiation of oral hygiene practices in infants and young children. We report here data gathered examining mothers' initiation and understanding of home oral hygiene for their children. Further understanding of this key activity is important. It is an activity that may help to reduce the prevalence and severity of early childhood caries as an oral health problem, especially among high-risk populations, such as Mexican-American children.

METHODS

A qualitative approach was used to gain an understanding of urban Latina mothers' beliefs and practices surrounding their children's oral hygiene. This approach consisted of in-depth interviews with mothers about their habits and beliefs surrounding their young children's tooth brushing and other oral hygiene practices. This project is part of a larger study detailed elsewhere.[35]

The study was conducted in a low-income, primarily Latino neighborhood in San Jose, a large, urban city in Northern California.[36] The county had previously been identified as being at high risk for ECC[37] so the study focused on a densely populated, particularly low-income neighborhood, in which many dentists accept public insurance. The county is unusual in that it provides health and dental insurance for all children, including migrants regardless of documentation status. Eligible participants were: (1) primary caregivers of children aged 10 or less, with an aim that the youngest child would be aged five years or less; (2) first- or second-generation immigrants from Mexico. The convenience sample of participants was drawn from multiple sources in the community, including a migrant parents' support group, various preschools, low-income dental clinics, community festivals, and referrals from other participants. Screening specifically for children who had experience with dental caries was not undertaken.

Interested participants were screened for eligibility and recruited into the study by bilingual interview staff, who obtained informed consent. All face-to-face interviews relied on an open-ended semi-structured interview guide approved by the Institutional Review Board of the University of California, San Francisco. Interview questions were developed based on previous studies of Latino immigrant and low-income populations' conceptions of oral disease and experiences with the oral health care system[1,5,8–11,38–41] and in consultation with a team of specialists in Latino children's oral health. Interviews documented mothers' conceptions of their children's oral health and disease as well as oral health-related behaviors based on these conceptions. All data are self-reported; no data come from medical or dental records. Main questions that generated the data analyzed in this article include:

- "When did [your child] start brushing or having his/her teeth brushed?"
- "Why did you decide to start brushing his/her teeth at that time?"
- "Tell me about his/her brushing routines"
- "When he/she was a baby, what did you do to take care of his/her mouth?"

- "How did you know to use the finger brush/cloth?"
- "How frequently did you use it?"

Forty-three interviews were digitally recorded in Spanish and 5 in English, then translated and transcribed. Data analysis was performed on the text using QSR International's NVivo 7® software package (QSR International, Doncaster, Victoria, Australia). Following standard qualitative analytic procedures, a short list of codes related to initiation of tooth brushing and oral hygiene practices was developed.[42,43] After application of these initial codes to the text, transcripts were re-read and initial codes were refined and applied, identifying themes as they emerged while reading transcripts and any written field notes about the interviews. [42,43] Two researchers independently read through the mothers' responses and coded them, reaching consensus on discrepant categorizations through discussion.

RESULTS

SAMPLE

The sample was comprised of 48 women, primarily from low-income, low-education, immigrant families. All women were mothers, and all were of Mexican origin or descent (see Table 1). The children of these mothers were primarily under 5 years of age (69%). The majority of children in this study (71%) had mother-reported caries experience (see Table 2). Data about oral hygiene practices are not reported for children under 3 months or over 10 years of age.

ORAL HYGIENE

Mothers mentioned initiating 2 oral hygiene techniques: (1) infant oral hygiene (IOH) and (2) regular tooth brushing (RTB). Infant oral hygiene refers to wiping teeth and gums, usually used on children under 18 months of age. The other oral hygiene technique of using a toothbrush, usually targeting children at least 1 year of age or older, is referred to simply as regular tooth brushing. IOH was usually performed by a caregiver on the child, while RTB was most often performed by the child, occasionally with parental or sibling assistance. The mean age at which mothers reported their children being able to brush independently was 3.1 ± 1.2 years. Each type of oral hygiene regimen had its own set of associated practices and beliefs.

Infant Oral Hygiene (IOH)—Nearly half of the children in these families (48%) experienced IOH, which involved mothers using a damp cloth, towel or little rag (*trapito*) or a rubber finger toothbrush (*dedal*) to clean and/or massage the child's teeth and gums. By age 2, all these children had transitioned to regular oral hygiene practices with a traditional toothbrush.

Infant oral hygiene, practiced by 26 mothers on 46 children, was generally started when the child was approximately 6 months old, ranging from 3 months to 12 months. Most mothers, however, described their child's size or dentition and not age as the markers of when they started IOH, such as, "ever since she was really little" or, "when his first 2 teeth came in." Massaging the gums, especially at the time an infant's teeth were erupting, was noted to have both hygienic and soothing effects.

There was variation in how mothers performed the actual cleaning in IOH. Most mothers (13) used a damp cloth, towel or rag; another 10 mothers used a rubber finger brush; 2 used both a cloth and finger brush, and 1 used just her finger. Pediatricians, and staff from the federal nutrition program for Women, Infants & Children [WIC] seemed to recommend

using both the cloth and finger brush equally (pediatrician= 5 cloth, 4 finger brush; WIC= 4 cloth, 3 finger brush). Most mothers only used water to clean the gums or facilitate removal of food residue from infant teeth, but 3 mothers used baby toothpaste or gel with the rubber finger brush.

The frequency of undertaking IOH ranged widely, from "after every bottle" (about 5 times a day), to 2 or 3 times a week. Altogether, 18 mothers talked about the specifics of when and how frequently they cleaned their baby's teeth/gums. The majority, 13 mothers, did IOH daily (usually 1–2 times a day) whereas a minority, 5 mothers, only did it 1 to 3 times a week. The reasons given for the habit were the same between the daily cleaners and weekly cleaners.

A total of 15 mothers mentioned that infant oral hygiene was intended to remove food residues on the child's teeth. What comprised food, however, was debated by these women. On one hand, 9 mothers mentioned using a damp cloth or rubber finger brush specifically to clean milk residue, as this mother explains:

> "…[the pediatrician] told us to take a washcloth and wipe them [the teeth] off… because he only had two teeth. So he [the pediatrician] told us to always clean his teeth with the cloth like that after he drank milk. And so I did clean them like that…"

Another mother explained what she learned:

> "…When he was born, I was told to clean his mouth with a cloth; his gums and tongue, so that the residue from his milk wouldn't stay there. They [WIC] say the milk can cause caries before their teeth come in. I started to clean his mouth so his teeth would come in fine…"

On the other hand, the other 6 mothers specifically said that milk was safe – rather, it was residue from other foods that was the danger, that needed to be cleaned from teeth and gums, as explained by this mothers (R=respondent; I=interviewer)

> I: How frequently did you use the finger brush?
>
> R: Usually in the morning and in the afternoon, usually. But they [WIC] told me to use it after each meal (*que comía*), but I'd only do it in the morning and afternoon.
>
> I: Did you use it after a meal, or just whenever you happened to remember?
>
> R: In the morning after she ate, and in the evening after the last meal (*comida*). That's when I would clean them. After breastfeeding (*pecho*) her I wouldn't. … I wouldn't do anything after breastfeeding her…

Not everyone who heard the messages about IOH adopted those practices, however, as the following quotation reveals:

> I: How did you know it was time for her to brush her teeth?
>
> R: I heard because I was going to the WIC programs. They told us there that we had to start cleaning their gums when they were babies and all that. I started when they already had their teeth, but they were telling us to start cleaning their *gums*. I didn't do that. I only started cleaning when their teeth came in.
>
> I: Why didn't you do it when there were only gums to clean?
>
> R: Because I said that they only had *gums*, that they didn't have *teeth*!

Regular Tooth Brushing (RTB)—Eventually all mothers had their children start using a traditional toothbrush to clean their teeth. The average age of initiation of regular tooth brushing (RTB) was 1.8 ± 0.8 years, with the age of initiation ranging widely, between 5 months and 5 years of age.

Mothers who practiced IOH started RTB when their children were significantly younger on average (mean=1.6 years) than those who only started oral hygiene routines with RTB (mean=1.9 years) (Pearson Chi-Square, *P*=.023). All children who had IOH began RTB before turning 3 years of age, while in the RTB only group, 10 children (22%) initiated tooth brushing at age 3 years or later. Of these late-starting children, the 3 children who started RTB at the oldest ages were children born and initially raised in Mexico (2 started at age 4, 1 started RTB at age 5).

A total of 28 mothers discussed initiating oral hygiene for more than 1 of their children. Most mothers (21 of 28, 75%) used the same cleaning techniques on all their children - 10 using infant oral hygiene followed by RTB on all of her children, 11 using RTB only. Seven mothers, however, used IOH on only some of their children. In 6 of these cases, IOH was used on the youngest child or youngest 2 children, with the older child(ren) receiving only RTB. These mothers explained saying that they were not aware of the IOH practices when their older children were infants.

> I: With your eldest child, did you also use the cloth with him, or did you start later?
>
> R: I started later [with RTB only] with my eldest because I didn't know [about IOH] at the time.

AMERICAN DENTAL ASSOCIATION STANDARDS AND TOOTH BRUSHING INITIATION

The American Dental Association (ADA) recommendations were used to categorize the timeliness of mothers' commencing oral hygiene practices with respect to their children. Infant Oral Hygiene is a fairly newly introduced idea. In 1986, the American Academy of Pediatric Dentistry introduced the policy of recommending brushing an infant's teeth upon eruption of first tooth.[44] At present, the ADA recommends wiping a baby's mouth and gums with a clean gauze pad after each feeding, and use of a baby toothbrush and water beginning when the first tooth erupts.[34] Babies get their first teeth typically between 6 and 12 months of age, [34] so for the purposes of this study 12 months (1 year) was selected and used as a generous cutoff as to when tooth brushing should have commenced. As shown in Table 3, not all mothers conformed to these standards. Six distinct groups emerged when parental practices were categorized along two main axes – use of IOH practices and child's age at initiation of RTB.

Only a small minority, 13% of mothers in this sample (the first row in Table 3), are following ADA recommendations and beginning regular brushing of their child's teeth by 1 year of age. An even smaller proportion (8%) included infant oral hygiene in their child's oral hygiene routine. Almost one-half (46%) of mothers are introducing a regular toothbrush much later than recommended, after their child is 2 years of age. This includes 40% of the mothers receiving and following educational messages about IOH. Despite not following ADA recommendations, there was no statistically significant relationship between these categories and parental reports about the child's caries experience, though clinical examination might have demonstrated a different outcome.

SOURCE PROMPTING ORAL HYGIENE INITIATION

The influence of external sources was much greater with respect to starting IOH routines than for RTB (see Table 4). Whereas relatively few women (13%) started IOH without

being educated about it or prompted by someone else, most mothers (78%) began RTB on their own initiative. Health professionals and the WIC nutrition program were particularly important sources of oral hygiene education for these low-income Latina mothers. This IOH mother explains how she learned to start using a fingerbrush:

> I: Where did you get the finger brush?
>
> R: I bought it.
>
> I: How did you know to buy it?
>
> R: I was going to classes at WIC and they told us how to use it. I didn't know. I had an [older] daughter but I didn't know how to do it. They [WIC] explained how to do it there. They explained that we had to clean their mouth before their teeth came out; later about cleaning their teeth when they [teeth] came out, and cleaning their tongue with a cloth. I learned all of that at WIC.

REASONS FOR COMMENCING RTB

Altogether, 40 mothers of 69 children, mentioned why they started brushing their children's teeth when they did. Of these 40 mothers, most gave just 1 reason per child, but 10 mothers (with 14 children) mentioned multiple reasons for starting an RTB regimen with a particular child – for example, being prompted by a health professional in concurrence with their own feeling it was time to begin introducing RTB. In these 10 cases, the first given reason was recorded and counted for that child. The 7 major reasons for commencing RTB oral hygiene routines are categorized in Table 5.

Dental Maturity—For mothers who decided to start regular tooth brushing on their own initiative, the most common reason given was the child's dental maturity, which mothers described as presence of teeth or the number or type of teeth the child had developed (such as molars). A common secondary reason was the kind of food the child could eat. These mothers used phrases such as "when [the teeth] had all come through… when she had all her little teeth," and "because I could see all his teeth and he was already eating all kinds of food" to explain their decision to start RTB.

> I: When did you change to the toothbrush to clean their teeth?
>
> R: That was when they had more teeth. That would be when they were 1 year and 4 months old, more or less. When they had the teeth above, I remember, maybe 3 [teeth], and the little ones below.

Child's Interest/Role Model—The next most-mentioned reason for introduction of the traditional toothbrush was the child's own interest in the activity and desire to copy role models, such as parents or older siblings.

> "…when he [age 1] sees me brushing my teeth, he comes to me and shows me that he wants to brush his teeth, too. He normally lets me brush his teeth. Up to now he has let me… At the moment he comes to me to show me he wants to brush his teeth…"
>
> "…I started brushing his teeth when he [age 1] was younger [than when his siblings started] because he'd see his brother and he wanted to brush his teeth, too…"

External Suggestion—While external sources such as health care providers were important sources prompting mothers to begin infant oral hygiene routines, they were not as influential with respect to the mother's decision to switch to regular tooth brushing. For mothers who did not practice IOH, however, external suggestions could be important

reasons for beginning RTB. For example, 1 mother noted, "…I started brushing his [teeth] when we started going to the dentist" whereas a second mother commented:

> I: So she had her first toothbrush at what age, more or less?
>
> R: At about 1 year and 2 months or 1 year and 3 months, more or less.
>
> I: And did you buy it….?
>
> R: Yes, I bought it. It was tiny…
>
> I: Because you took her to the dentist's or because it was time to do it?
>
> R: Because I attended classes. I like attending health classes and when I hear there is a class somewhere I rush along… to the school or, also, I go a lot to the [name of organization] and they show you things there and you pick things up. Also at the WIC. They tell you that the kids have to learn to clean their teeth at an early age. Then, as I've had 3 children, I got more and more experienced. With the first one, it wasn't the same as with the other 2…

Child Capacity—Mothers practicing IOH mentioned reasons pertaining to the capacity or development of their child as the reason for switching and commencing RTB. Child capacity was explained as when the child was able to brush his own teeth, or when he could understand what the mother was doing. This reason was not given by any RTB-only mothers.

> "…When he was smaller I'd clean them with a towel. When I see they have 2 [teeth], like my daughter now, I just use a towel. Once they are 1 and a half, or 2 years old, I start to see what they can do alone. It's important to get them used to that, teach them that they have to brush them. I usually brush them first and then let them do it, so that they play… They learn…"

Child Size/Age—A somewhat minor reason given by several mothers was that the child had reached an age or physical size when oral hygiene practices were easier to commence:

> I: How did you know it was time to switch them to a toothbrush?
>
> R: Once they were able to brush their own teeth. On the toothpaste [tube] it says what age they can have it. So once they start, I can't think of it right now, but once they hit that age where they can use the toothpaste, then going from the baby toothpaste that they can use to the normal toothpaste that they have for kids. That's when… a couple of years old…

Poor Hygiene or Presence of an Oral Problem—Only 2 mothers mentioned an oral problem, such as bad breath or "stains," as the main reason they started brushing their child's teeth.

> I: How did you know it was time to start brushing her teeth?
>
> R: Because her 2 teeth at the front were starting to get stained and I thought it was time to start brushing them.
>
> I: So you bought her a toothbrush… and did you know how to brush her teeth or did someone teach you?
>
> R: My mother told me how to do it.
>
> I: And you brushed her teeth?
>
> R: Yes.

But 5 IOH mothers mentioned oral problems as a secondary reason. When mothers engaging in IOH decided that the finger brush or cloth did not adequately clean the child's teeth, they would switch to using a traditional tooth brush.

Other Reasons—There was also a variety of other, more individual reasons mothers gave for why they started brushing their children's teeth when they did. These included finding a child-specific soft toothbrush, weaning a child from the bottle, moving to the U.S. from Mexico, and a desire to prevent cavities. Only 2 mothers (4%) mentioned caries prevention as the primary reason they began brushing their children's teeth. At other points in their interview, however, 70% of all mothers mentioned poor oral hygiene as a main cause for caries, and commented that tooth brushing was a key way to prevent caries. This may imply that mothers recognize the importance of oral hygiene, yet do not perceive when their children are at risk for caries in the first 2 years of life.

Age of RTB Initiation by Reason—Although each reason for commencing RTB was associated with a wide age range at which initiation was said to have taken place, overall, these differences are not statistically significant (Analysis of Variance, $P = 0.15$). The Dental Maturity and Child Interest/Role Model reasons had the earliest regular brushing initiation with an average age of 1.4 years. External Capacity and Child Capacity had slightly later average initiation ages, at 1.8 years and 1.9 years, respectively. The miscellaneous category Other led to an even later start to RTB, at 2.2 years. Nor is there a statistically significant relationship in this sample between parental reports of the child's caries experience and age of RTB initiation (Univariate Analysis of Variance, $P = 0.90$).

DISCUSSION

These findings are consistent with the very limited literature that focuses on toothbrush initiation habits, publications that show that tooth eruption and external guidance are important factors in creating a tooth brushing habit.[31,33] Even though the few existing articles are based in Nagoya, Japan, the ages of initiation are similar. Latina mothers have an organized set of beliefs around when regular tooth brushing should begin - including the child's having teeth, eating solid food, and children having an interest in tooth brushing. In this study, the average age of tooth brushing initiation was 1.8 ± 0.8 years.

Overall, for almost half this sample, infant oral hygiene practices (mouth wiping) were initiated around 6 months of age. This, however, was extremely influenced by pediatricians and WIC staff, with 87% of mothers only initiating the practice as a result of outside prompting. A minority (13%) of the mothers that receive or follow these early prevention messages initiate regular tooth brushing by the ADA recommended age of 12 months. Far more mothers, 41%, do not transition to regular tooth brushing until their child is 2 years or older, indicating that the educational messages do not continue, are not received, are not followed once the child passes infancy, or that there are other barriers at play, such as cooperation of the child or mother's belief that RTB should begin when her child can hold a toothbrush without assistance.

These data suggesting that caries status is not related to age of initiation or practice of IOH or RTB are consistent with the literature, and support the idea that oral hygiene is a complex, multi-factorial practice that cannot be captured with a single variable. Factors not measured in this study but reported in the literature as influential, such as quality of brushing, frequency, mother participation, and timing, likely affect the habit's effectiveness at improving oral health.[14–22,24,25,27,28,30]

Mothers have mixed views about the deleterious effects of milk residue on teeth. This could possibly be the result of a translation error within the educational setting. The Spanish word *comer* (to eat) specifically refers to food—not breast milk. WIC and other educators might be saying "use the cloth to clean her mouth after every time she eats" implying bottle, breast milk, and "food," as is more common in English, while these Mexican-American mothers are interpreting this instruction to only mean solid food, as implied by the Spanish word *comer*. The following interchange illustrates this point:

I: How often would you use the fingerbrush?

R: Every time I would feed her. (le daba de comer)

I: Every time?

R: I would give her food once per day and I would clean them [the teeth].

This mother is not giving her child sustenance only once per day, rather she is distinguishing between "food" and milk. The mother is referring to a child of approximately 1 year of age —when most children are consuming a mix of milk and "food".

Some evidence suggests that rural Latina mothers do not always recognize early signs of carious activity on young children's teeth, but rather categorize discolorations as "stains" in need of 'cleaning.'[45] The same kind of (mis)understanding might be behind the initiation of regular tooth brushing for a "Poor Oral Hygiene" reason.

Limitations

Limitations of this study include having a small convenience sample, a single location, and recall and social desirability biases. In particular, we have limited detail on the specific age of oral hygiene initiation, with mothers recalling general ages only. Kwan and Williams report inconsistency in parental recall of what age tooth brushing began.[46] We also have limited access to accurate caries status (parental report only, sometimes without her child having had a dental visit in the last 6 months). Generalization, including to other Mexican-American populations in a different location or of a different socio-economic status, needs to be undertaken with caution. Nevertheless, this is one of the few studies of its kind investigating the timing and reasons for home oral hygiene initiation, and the only one we are aware of that has been conducted in the United States, and available in English.

IMPLICATIONS FOR PRACTICE

The success of WIC and pediatricians in influencing nearly half of the sample to practice infant oral hygiene, and the number of mothers that adopt IOH for the younger children in their families after learning about it, suggests that the community is receptive to educational messages. However, some mothers that receive the messages do not follow them, particularly when the messages contradict their own, strongly held beliefs. More tailoring of educational messages is a key way to help mothers reconcile their own beliefs with recommended measures in order to facilitate adoption of new habits. Additionally, these "early adopter" mothers are not receiving educational messages about when to transition to a regular toothbrush. Their initial strides in maximizing the oral health of their children may be compromised if they are still using a cloth to wipe their 2-year-old child's teeth. More could be done by pediatricians, WIC and other similar influential groups to increase RTB initiation at an earlier age. Dentists can play a role by helping pediatricians, WIC staff, and other community health educators receive up-to-date, accurate and appropriate educational messages and materials. However, dentists are at a disadvantage to directly impact this population early enough because few oral health practitioners accept children under age five, or children with public insurance as patients.[47–51]

CONCLUSION

The following conclusions can be drawn based on this study's findings:

1. Mexican-American mothers have a set of beliefs around when regular tooth brushing should begin - including the child's having teeth, eating solid food, and children having an interest in tooth brushing.
2. Despite virtually half this sample engaging in infant oral hygiene practices, the average age of regular tooth brushing initiation was 1.8 years of age, and only 13% of mothers followed ADA recommended oral hygiene guidelines for their children and initiated regular tooth brushing by age 12 months.
3. More oral health education needs to be directed at low-income Latina mothers of children aged five and under. Pediatricians and WIC providers seem particularly well situated to reach this population at an appropriate young age, but education needs to include the transition and timing of regular tooth brushing initiation. Dentists can help by ensuring that pediatricians, WIC, and other community organizations have current, accurate, and effective educational information.
4. Such education needs to be culturally appropriate. Educators must become more aware of and responsive to different linguistic and cultural constructions and meanings of common terms, such as food or the signs of caries, for example.

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Table 1

Socio-Demographic Profile of Urban Mothers (N = 48)*

		Mean ± Std. Dev., or Percent	Note
Gender (Female)	N = 48	100%	
Mother's Age (Years)	N = 47	31.1 ± 5.6	Range = 20 – 44, Median = 32.0
Years Education	N = 45	8.9 ± 2.8	Range = 2–15, Median = 9
Family Annual Income†	N = 40	$24,600 ± 12,800	Range = $4,450 – $70,000 Median = $24,000
Has Health Insurance	N = 46	35.4%	About half of these insured people receive MediCal‡
Years in U.S.	N = 43	8.9 ± 4.8	Range = 0.75–21, Median = 8.3
Rural Origin ¶	N = 48	52%	
Children in Family	N = 48	2.5 ± 1.0	Range = 1–5, Median = 2
Report Untreated Dental Problem for Self	N = 48	60%	

*Not all participants responded to all questions.

†U.S. $ (2007); the federally-defined poverty threshold for a family with 3 children is $24,744.[52]

‡Federal health coverage for the poor, Medicaid, is known in the state of California as MediCal.

§The five participants born in the United States were not included in this row.

¶Rural was defined as "*pueblo*" or "small town/village" of approximately 15,000 or fewer inhabitants.

Table 2

Socio-Demographic Profile of Children (N = 71)*

		Mean ± Std. Dev., or Percent
Age (Years)	N = 71	5.0 ± 2.6†
Gender (Female)	N = 51	43%
Born in U.S.	N = 71	82%
First-born Children	N = 71	42%
Average Years in U.S. for Mexican Born Children	N = 13	3.0 ± 1.9
Health Insurance Status	N = 69	
Denti-Cal		54%
County Insurance		33%
Private Insurance		10%
Uninsured‡		3%
Age of First Dental Visit (Years)	N = 52	2.9 ± 1.3
Ever Had Caries (mother report)	N = 63	71%

*Not all participants responded to all questions about all their children.

†Range = 3 months to 10 years; 69% of the children were age 5 years or less

‡The uninsured children were on a waitlist for county insurance.

Table 3

Child's Oral Hygiene Experience in Relation to American Dental Association Recommendations

Age at Initiation of Regular Tooth brushing	**No Prior Infant Oral Hygiene Number of Children, %**	**With Prior Infant Oral Hygiene Number of Children, %**	**Totals Number of Children, %**
	N = 43, 52%	**N = 3, 48%**	**N = 82, 100%**
Less than 1 Year*	4 5%	7 9%	11 13%*
Between 1 and 2 Years	17 21%	17 21%	34 41%
Age 2 or Greater	22 27%	15 18%	37 45%

*Matches American Dental Association Recommendations

Table 4

Source Prompting Initiation of Home Oral Hygiene Routines

Source	Infant Oral Hygiene		Regular Tooth Brushing	
	N*	%	N*	%
	N=23		N=45	
Self-Initiated	3	13%	35	78%
External	20	87%	10	22%
Pediatrician	10	43%	3	7%
WIC	7	30%	2	4%
Dentist	0	0%	4	9%
Friend/Family	3	13%	1	2%

* These numbers reflect number of children for whom mothers gave both a reason for habit initiation and discussed their habits.

Table 5

Mothers' Reasons for Commencing Regular Tooth Brushing with Each Child

Reason	All Children		For Children Who Ever had Infant Oral Hygiene		For Children Who Only had Regular Tooth Brushing	
	N	%	N	%	N	%
	N = 69			N = 35	N = 34	
Dental Maturity and/or Food	28	41%	17	49%	11	32%
Child Interest/Role Model	10	14%	5	14%	5	15%
External Suggestion	11	16%	3	9%	8	24%
Child Capacity	8	12%	8	23%	0	0%
Child Size/Age	3	4%	1	3%	2	6%
Poor Hygiene or Other Oral Problem	2	3%	0	0%	2	6%
Other	7	10%	1	3%	6	18%