SCIENTIFIC ARTICLE

Attitudes of Chinese Parents Toward the Oral Health of Their Children With Caries: A Qualitative Study

Diane Wong, DDS[1] Silvia Perez-Spiess, DDS[2] Kell Julliard, ATR-BC[3]

Abstract

Purpose: The purpose of this study was to investigate Chinese parents' beliefs and perspectives regarding extensive caries (EC), oral care habits, and dental treatment. An overview of qualitative research methods is provided.

Methods: In this qualitative study, 20 in-depth interviews were conducted with parents of children diagnosed with EC. Parents lived in a major metropolitan area, and many were newly immigrated. Parents who accepted or refused dental treatment for their children under general anesthesia or sedation were included. Transcribed interviews were analyzed using standard thematic analysis.

Results: Negative themes were: (1) fear of dental anesthesia and its adverse effects; (2) parents' own lack of dental education as children; (3) lack of social support in seeking dental treatment; (4) inadequate knowledge of oral hygiene; and (5) cultural beliefs that did not support the preservation of the primary dentition. Positive themes were: (1) trust in the providers and in Western medicine; and (2) satisfaction with outcomes of dental treatment.

Conclusions: Several factors were found that could contribute to a higher rate of EC in this population. Providers can benefit from this study by anticipating what practices and attitudes are common in this community. Earlier intervention and delivery of culturally sensitive care can prevent or delay progression of this dental disease. (Pediatr Dent 2005;27:505-512)

KEYWORDS: QUALITATIVE RESEARCH, HEALTH KNOWLEDGE, ATTITUDES, PRACTICE, CHINESE AMERICAN, INTERVIEWS, ORAL HEALTH, ORAL HYGIENE

Received January 24, 2005 Revision Accepted November 4, 2005

Although many children seen in inner-city community dental clinics in New York City are Latinos, the number of Chinese children treated has increased dramatically because of the changing demographics. The area of Sunset Park, Brooklyn, NY, has one of the largest Chinese communities in New York City, with many residents who are immigrants from Hong Kong and the Chinese provinces of Fuzhou, Guangzhou, and Shanghai. The parents, who are often not well informed on oral health, bring their children to either the clinics or the hospital. Numerous children present with extensive caries (EC). Because of the extent of the dental treatment or their inability to cooperate, they sometimes receive dental treatment under general anesthesia or sedation.

[1]Dr. Wong is attending pediatric dentist, Brooklyn Chinese Family Health Center, Brooklyn, NY; [2]Dr. Perez-Spiess is program director, Pediatric Dentistry, and [3]Mr. Julliard is research program director, Lutheran Medical Center, Brooklyn, NY.
Correspond with Mr. Julliard at kjulliard@lmcmc.com

The primary etiologies of EC consist of: (1) presence of *Streptococcus mutans*; (2) fermentable carbohydrates metabolized into organic acids; and (3) a susceptible tooth surface. Other factors such as feeding patterns, oral hygiene, and various habits are also associated with EC.[1] Less studied topics are: (1) parental awareness toward treatment; (2) cultural attitudes and social influences; (3) habits; and (4) knowledge regarding dental caries. These are now also thought to be contributing factors.[2-4]

While quantitative research has been carried out in China to study caries prevalence,[5] minimal qualitative research has examined the attitude of parents toward oral health. One relevant, partially qualitative study[6] from the province of Wuhan, China, focused on clinical examinations of children in grades 1 and 6. In this study, mothers were interviewed about their attitudes toward and knowledge of oral health. Schoolteachers were given a questionnaire regarding their oral health knowledge and views towards oral health education. Few mothers believed that young children needed help from adults in tooth clean-

ing. As a result, the children had poor oral hygiene habits. Teachers showed a comparatively higher level of dental knowledge. The authors recommended developing an oral health plan emphasizing prevention.

Qualitative research has been conducted in other populations regarding baby bottle tooth decay, for instance, in Native Americans,[7] but this kind of research relating to a Chinese population in the United States was not found in a Medline search. Because these oral health-related attitudes held by Chinese citizens regarding feeding practices, oral hygiene, and habits are unclear, qualitative research was, therefore, the preferred methodology used to investigate them. From this study, practitioners may better understand how to render culturally sensitive care to Chinese patients and to improve their communication with parents by anticipating their concerns.

An overview of qualitative research

Formal techniques of qualitative research have been used in health care for several decades.[8] The journals of many disciplines,[9-13] including dentistry[14,15] and evidence-based medicine,[16] have published articles introducing their readers to qualitative research. No article was found in a search of PubMed, however, that introduced the pediatric dentistry community to qualitative research. It is, therefore, appropriate to include in this article a brief description of the principles and methods of qualitative research.

Quantitative investigative methods are ideal for answering clear, focused research questions where well-defined, validated measurement techniques exist. In areas of study where hypotheses are not yet clear and where human behavior, attitudes, and reactions play a major role, qualitative methods are called for, at least initially.[8] Because qualitative research tries to identify and clarify the dynamics of thought, belief, and action, its methods are, in many respects, opposite to those of quantitative research. Its data, which consist of statements, feelings, and actions, are gathered in 3 main ways: (1) focus groups[17,18]; (2) interviews[19,20]; and (3) observation.[21,23] With interviews and focus groups, a flexible interview guide is developed to guide interactions with subjects. Participants' verbal expressions are recorded and transcribed. Themes are then identified in the transcripts, and hypotheses are developed and modified as the data collection proceeds. Thus, the questions asked during the interviews may change over time as the researchers' understanding of the issues deepens. Instead of random sampling and the creation of a control group, a population is sampled selectively and purposefully, so that the researchers can identify the range of thoughts, feelings, and actions present. The statements, feelings, and actions of individuals and subgroups interviewed are compared and contrasted. The goal is not to be able to state the percentage of people believing something in the population, but to verify that a particular range of beliefs exist.

Whereas blinding of researchers is often essential in quantitative research, the researcher's immersion in the world of the subjects is valued in qualitative research. The researcher must understand on many levels the complex relationships of belief, feeling, and behavior related to the issues under consideration. When the data are presented in written form, statistics such as percentages are not emphasized because they are not generalizible to a larger population. Instead, emphasis is placed on similarities and differences within the themes found in the data. Quotations are used to give the reader a vivid sense of the subjects' world, life, and mental constructs.

Validity and reliability are taken just as seriously in qualitative research as in quantitative.[24] Common means used to enhance validity are:

1. triangulation (comparison of themes found in different types of data);
2. saturation (collection of data until no new themes appear);
3. check coding (blinded identification of themes in transcripts by more than one researcher).

Considerations related to reliability are comparable to quantitative research in that research findings should only be applied to similar populations in similar settings and generalization to other groups and settings must be done carefully.

Methods

The participants were Chinese parents of patients under the age of 12 years who were seen within the past 5 years at an inner-city community dental clinic and who were referred for dental treatment in the operating room. Some children had already completed treatment under general anesthesia or sedation, and others had started the process but not yet completed it. Also included were families who refused dental treatment under general anesthesia or sedation.

An interview guide was developed focusing on 4 main topics:

1. oral hygiene, habits, and feeding patterns of the child before and after dental treatment;
2. parental attitudes toward dental treatment, dental problems, and dental visits;
3. previous experiences;
4. cultural beliefs of the families.

The clinic's institutional review board approved the study.

Parents were contacted either by telephone or approached when they brought their children to the hospital for treatment. Telephone calls were made to 30 parents. The goal of the study was explained. Parents were told that their participation would not affect their or their children's future care. Four parents refused the interview, 6 could not be reached, and 20 agreed to be interviewed. The participants signed consent forms before being interviewed. The interviewer communicated that the insights parents shared would hopefully improve the dental care and experiences of other patients and parents. A few interviews were conducted in the hospital, but most were in participants'

homes, depending on their preference. The parents were encouraged to share their feelings and beliefs and to answer questions honestly. They were given the right to decline answering any question if they preferred and were asked to remain for the entire interview. A pediatric dental resident of Chinese ancestry born in the United States and fluent in English, Mandarin, and Cantonese contacted all parents, conducted all interviews, and was the only nonfamily member present at them. The interviews were conducted in English or in Chinese and tape recorded. Most interviews lasted 30 to 45 minutes. At the end of the interview, a toothbrush, toothpaste, and a $10 gift card were given to each participant.

All interviews were translated into English and transcribed after each session by the first author, who identified important themes (ie, completed all initial coding) immediately after transcription. As the research progressed, 18 themes were defined, modified, and grouped under the headings below by all 3 authors: (1) a Chinese pediatric dental resident; (2) an experienced pediatric dentist; and (3) an experienced qualitative researcher and interviewer. Data analysis was conducted using a grounded theory approach in which explanatory models are generated based on the content of the interviews.[8] The emergence of new themes, their definitions, and possible changes in definitions of themes were discussed by all 3 authors regularly. The last author periodically did check coding of transcripts to enhance validity. As the study progressed, data related to each theme were compared, and the interview guide was modified by all 3 authors to reflect new insights and theme changes.

Results

Twenty-two relatives (17 women and 5 men) were present at 20 interviews. In 18 interviews, only 1 parent was present. In one, both parents were present, and in another a parent and grandparent were present. These parents had 24 children with EC (16 boys and 8 girls). All parents interviewed were immigrants from China, most within the last 10 years, currently living in a large, northeastern, inner-city urban environment of New York City. Sixteen of the 22 relatives interviewed had prior contact with the resident, and 6 had not. Table 1 contains information about sample demographics, anesthesia, and completion of treatment. The dental records from 20 of the 24 patients were located (4 of the 20 patients with chart information refused treatment). The number of carious teeth in these patients ranged from 6 to 20 (median=11). Sixteen of these patients had from 0 to 20 extractions (median=5) and from 0 to 10 restorations (median=5).

Parental attitudes regarding oral health, general anesthesia, and dental treatment emerged from the interviews. The themes that prevailed most were: (1) parental background; (2) oral hygiene and related habits; (3) reasons for seeking dental treatment; (4) feelings about dental treatment under general anesthesia or conscious sedation; (5) cultural remedies; (6) cultural beliefs about primary teeth; and (7) social influences that affected the parents' beliefs.

Table 1. Characteristics of Study Sample

Characteristic		N (%)
Patient's sex	Male	16 (67)
	Female	8 (33)
Parent's sex	Male	5 (23)
	Female	17 (77)
Patient's place of birth	China	2 (9)
	United States	20 (82)
	Other	2 (9)
Procedures	General anesthesia (treatment completed)	15 (62)
	Sedation (treatment completed)	1 (4)
	Sedation (treatment incomplete)	2 (8)
	Refused dental treatment under general anesthesia	5 (22)
	Refused dental treatment under sedation	1 (4)

Parental background

Parents were questioned about their childhood experiences with dentists as well as present experiences. Ninety-five percent of the parents interviewed recalled that, in their own childhood, they did not visit the dentist regularly. For some, their first dental visit was in the United States. One father recalled, "When I was 6 years old, I lived in the villages of China. I had a very bad toothache. My mom went to work, and I was home alone. In the villages, there are these so called 'neighborhood dentists.' They come around to the villages and go around to the different homes to do extractions or fillings if you needed treatment. I had a molar extracted and I fainted. Now that I am in the United States, I have Medicaid. But prior to having Medicaid, I went back to China to get my teeth fixed because it was cheaper."

Oral hygiene and related habits

Most of the children were born either in the United States or China. Twenty-two percent of the children who were born in the United States were sent back to China to be cared for by grandparents or relatives. They stayed in China for a range of a few months to a few years because parents needed to work and could not care for the children themselves. These children remained in China until the age of 4, returning to the United States for schooling.

Sixty-five percent of the parents interviewed said that brushing the teeth of children under age 4 was not done either regularly or at all and neither was it encouraged. A child of 4 or 5 years (ie, school age) was expected to start

brushing on his/her own. One parent commented, "When children go to school they will learn how to brush by themselves." In the villages of China, dental equipment such as toothbrushes was not easy to access. One father said, "If a child's teeth started deteriorating, then they would deteriorate rapidly." One mother said that she started to brush her son's teeth when he was only 1.5 years old, however, because she began to see "black spots" on his teeth already.

From the initial food intake (milk), poor eating habits developed. Most parents stated that their children liked to eat sweets such as candies and cookies. Furthermore, many children were bottle-fed, and only a few were breast-fed. With only 1 exception, parents were not aware that sleeping with the bottle could lead to dental caries. One mother said, "My daughter used the bottle until she was 6 years old. Although she used it only when she went to sleep, she was in first grade already." Another mother said, "When my son slept, I placed the bottle next to him on the bed. He had a habit of sucking the bottle and falling asleep, and he knew how to reach for the bottle himself." One mother stated, however, "My daughter used the bottle until she was quite old and almost when she started prekindergarten. I did not let her go to sleep with a bottle because I know that would cause cavities. The pediatrician informed me of this."

Reasons for seeking dental treatment

Fifty-five percent of the parents brought their children in for dental examinations only when pain was present. For instance, one child was brought to the hospital because of pain. Her mother stated, "I brought her to a private dentist before, but we did not have insurance. The cost of treatment was expensive there, so we did not go."

Fifty-five percent of the parents stated that having dental insurance made seeking dental treatment less of a financial burden. Even so, few parents stated that they brought their children for dental checkups early in childhood solely for the purpose of prevention. Occasionally, parents mentioned pediatricians' referrals for teeth cleaning and checkups.

One common belief concerning preventive dental care was that cleanings would loosen and scratch the teeth. One mother stated, "All my friends and relatives don't like to go for cleanings. When they have pain, then they go...In the Chinese culture, people think that if you get cleanings too much, the teeth will get loose, and you scratch the surface of the tooth."

Feelings about dental treatment under general anesthesia or conscious sedation

Seventy percent of the children were uncooperative and needed extensive dental treatment. Therefore, treatment under general anesthesia or sedation was recommended. A theme found in the interviews was the fear of the use of general anesthesia or indeed of any anesthesia. Parents commonly thought that general anesthesia or anesthetic medicines would affect the development of the child's brain. Even parents who agreed with dental treatment under general anesthesia experienced fear. One mother said, "At first, I had a fear of general anesthesia because it can threaten the life of the child. When I brought my daughter into the operating room and the mask was placed on her nose and I saw her eyes close right away, I felt very scared. It was very difficult to bear at that moment. During the waiting period, it was very difficult also. Normally, we do not think that it is necessary to do general anesthesia to deal with dental problems. My friends say that this is a big surgery and the anesthesia is harmful to the child's health."

Another mother commented, "If you let your child have so many surgeries, she will become mentally challenged... Some older folks said, 'Wow, you are letting your daughter be a guinea pig by allowing so many surgeries?'"

Regarding his son, one father believed that "the anesthesia had negative side effects. It has affected his temperament, and he is a very impatient and short-tempered child as a result."

Seventy percent of the parents believed that anesthesia could cause other physical problems and would be harmful for the child. Some of the fears were about the anesthesia's effect on the child's memory, growth, and development and whether the child would awaken after the surgery. For instance, one parent said, "I do not like the use of general anesthesia because I feel that it has negatively affected my older son's health. He has a history of asthma, and I feel that his symptoms were exacerbated after the surgery."

These fears sometimes served as motivations for better oral hygiene. "I am doing my best to keep my younger son's teeth clean and hope that the carious teeth will not result in any acute pain. I would rather wait until he is older and seek treatment only if he complains of pain, and hopefully by then general anesthesia will not be necessary."

Ten percent of the parents expressed that they did not fully understand that their children were going to receive anesthesia. A parent said, "At the time I did not know he was going to undergo surgery until I actually brought him into the operating room. Maybe it was not translated clearly to me in Chinese, but I cannot remember. And because I was not clear on what was going to be done, I was not apprehensive."

Regarding sedation, fear was also present but to a lesser extent. Even a mother who had had extensive experience with sedation said regarding her children, "I was afraid the anesthesia would affect their memory." Reassurances by the anesthesiologist, dentist, and pediatrician regarding any side effects, however, were sufficient to change some parents' decisions.

Twenty-five percent of the parents were not satisfied with proposed treatment or treatment that had been rendered. A mother brought her daughter in for sedation, but the treatment was not completed because they did not return for the second sedation appointment. She said, "Most

of all, my daughter had a significant amount of hair loss after the treatment...I suspected that the anesthetic medicines may have had side effects of hair loss, and when I inquired about this with her pediatrician, he agreed with the possibility."

Cultural remedies

When parents were asked how they managed their child's acute dental pain or swelling, many said that they brought the child either to a pediatrician or dentist. Only 5% of the parents would prepare Chinese herbs for their children to eat or drink as the first option of treatment for illness. Parents sometimes would medicate themselves with Chinese herbal medicines if they had dental pain or swelling, but they did not give these to their children for this purpose. Occasionally, however, they would prepare Chinese herbs for their children to eat or drink to prevent illness. Also, some parents said that they used white wine or vinegar as a home remedy to ease tooth pain temporarily.

A common belief of Chinese people is that the body has a balance of yin and yang.[25] If these become unbalanced, illness may develop. For example, a person who has periodontal swelling is believed to have such an imbalance, with acute excessive heat (yang) in the body. Therefore, people with periodontal swelling will drink Chinese medicinal herbal teas that are "cool" (yin) to bring down the heat in the body. Chinese medicinal healing is difficult for Western-trained health professionals to comprehend. Many Chinese still regard it as effective, although some do not. One mother said, "I use Chinese medicinal herbal teas (literally, "cool tea") to soothe a toothache, swelling, or fever for myself...However, my kids will not drink this because it has a very bad taste."

Another mother recalled, "Chinese people say that when there is swelling, there is an increase in the element of fire in the body. We believe that certain Chinese herbal medicines will decrease the fire, and the swelling will go away. I think my grandma used this method because they thought the culprit of bad breath and swelling was due to the increase in fire. I do not think they understood the reasoning that decayed teeth could cause swelling."

Parents did not usually rely primarily on cultural remedies for a cure. If the child had acute tooth pain or swelling, they sought help from Western physicians or dentists. Forty percent of the parents would use Chinese medicines as an adjunct to therapy. Since the majority of the adults were recent immigrants, they would commonly use Chinese medicines as a part of their culture and belief. The majority concurred that Chinese medicines brought about temporary relief of symptoms but sought Western physicians and dentists for more definitive treatment.

Cultural beliefs about primary teeth

Seventy-five percent of the parents doubted that treatment for decayed primary teeth was essential. Parents revealed a common cultural belief that baby teeth were not as important as adult teeth. Baby teeth did not need to be fixed because they would "fall out" by themselves. For the parents who held strongly to this belief, this was one of the reasons why they declined dental treatment for their children. Although many parents were not initially educated about the importance of preserving the primary dentition, some later recognized the importance. They became aware of the potential risks and problems of carious teeth. These parents accepted the dentists' recommendations and chose to bring their children for dental treatment. One mother said, "At first, I thought that baby teeth are not important until the dentist explained to me. They told me that if the baby teeth became infected they can affect the permanent teeth underneath. Then I became concerned and decided to allow my daughter to have treatment."

Social influences

Parents were asked if social influences, such as friends, family, public news, or schools, affected their decision to accept or refuse treatment.

Fifty-five percent of the parents expressed that they had a lack of support from family members and friends regarding dental treatment. Even though many did not receive social support, 75% of the parents nevertheless decided to authorize dental treatment. A mother described her feelings prior to her daughter's surgery, "Rarely have I heard that so many extractions could be done at once in a child. I thought, the child is so young, why do it? Most of my family is in China, and their habits and beliefs are that of traditional Chinese thinking. I called them and discussed the situation with them prior to the surgery. They did not agree with the recommended treatment. I also discussed it with my husband, but he agreed with me. We felt that we should cooperate with the dentist. My child's tooth was rotten to the root, and I knew that extractions were needed."

The media also played a role. One mother said, "I read in the Chinese newspapers a few months ago that in Taiwan a child had undergone surgery for dental treatment and later ended up in a coma and eventually died as a result of complications. It frightened me, but I realized that the child had other medical problems such as an underlying cardiac condition that led to his death, and it was not because of the multiple extractions that he had. I thought that doing extractions was acceptable, but the concern was that my son needed extractions of 12 teeth. I was apprehensive of the fact that so many teeth needed to be extracted at once. My mother-in-law scolded me, and she did not approve of the recommended treatment. We both preferred that the extractions be done in separate appointments. Eventually, I made the decision to go ahead with the treatment because I knew my son had stable health and that his surgery would not be very dangerous for his health."

A mother said that her parents as well as her in-laws were against the idea that their grandson should undergo den-

tal surgery. The mother said, "All I could think about was that I saw my son often had tooth pain. I could not bear it anymore, and I wanted the treatment done soon so that he would have relief...I felt terrible that I was disrespecting the elders in the family, but I knew my child needed dental treatment."

For other parents, social influences affected their decision so that they eventually refused treatment. A mother said, "Some of my friends are doctors in China. They said that in China they do not perform multiple extractions all at once. Even here in the United States, I had asked some people regarding dental surgery, but no one has ever heard of this. They did not recommend a child to have dental treatment under general anesthesia and especially not extracting twenty baby teeth at once. Therefore, I did not want my son to have this dental surgery."

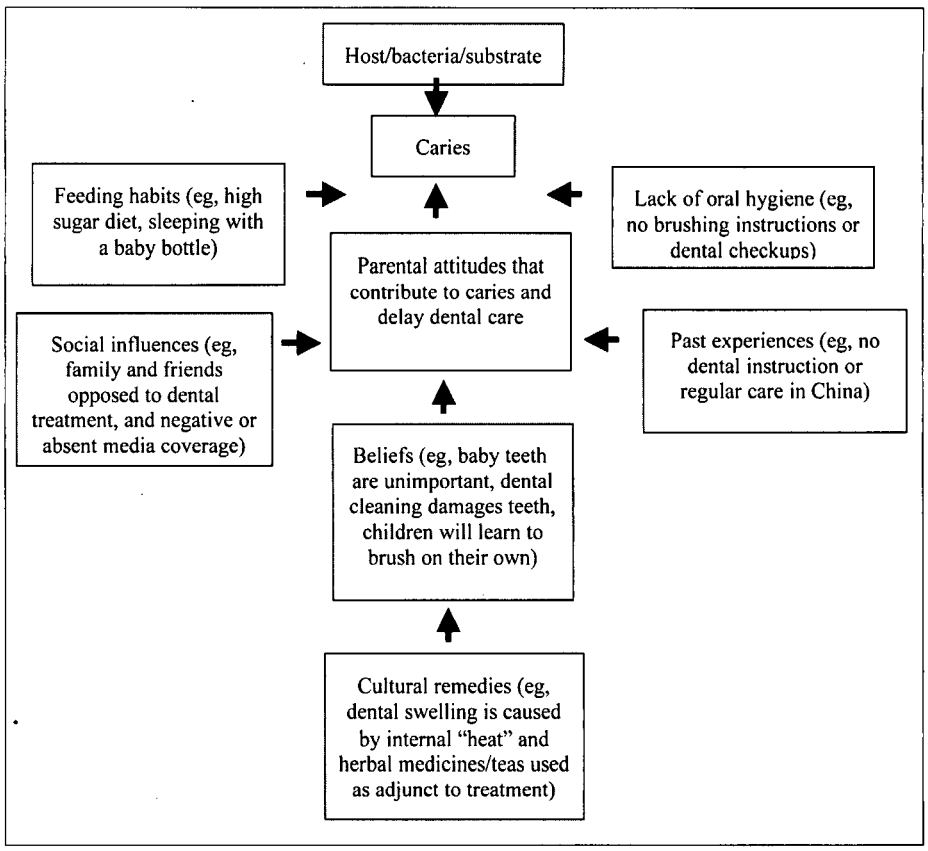

Figure 1. Factors affecting the development and treatment of early childhood caries in a Chinese population.

Another mother said that "the dentist reprimanded me for not taking care of my son's teeth, and now he has many cavities. I felt guilty because I did not do a good job caring for my son. The truth was that I did not know that his baby teeth were important." Her mother, however, "reassured me and told me that I did not do anything wrong. She told me that it was not necessary to have the baby teeth fixed, so, therefore, I did not go for the treatment. The hospital called me to try to schedule an appointment for the surgery, but the waiting period was so long that I noticed my son's baby teeth had begun to fall out already. Then, I did not feel the need for the surgery anymore."

Institutions in China such as hospitals also affected parents' beliefs regarding dental treatment. One mother brought her son "to the hospital (in China) to check his teeth because I noticed they were black. They said that he was too young and that they needed to wait until he was older. They explained that if the front teeth were extracted now, the permanent teeth would not erupt for a long time. In China, the dentist said to wait until the child is around 5 years old before doing the treatment."

Even after treatment, reactions could be extreme. "When friends saw my son, they were very shocked and afraid. My friend gasped when she saw my son and said, 'Wow, so many extractions were done? That is really frightening!' That was the common reaction I got from friends when they saw my son. I reassured my friends that my son was doing well and that the treatment was necessary."

Discussion

This qualitative research study showed that:

1. immigrant Chinese parents' own childhood did not stress oral hygiene;
2. many parents feared general anesthesia and sedation;
3. cultural beliefs affected some parents' decision to allow treatment;
4. parents' social support systems often opposed treatment as well.

In Figure 1, the authors propose 1 possible structural model of how these factors contributed to children developing EC.

Perhaps from a lack of knowledge, many parents did not brush the teeth of their children who were under 5 years old. This is consistent with findings from a previous study, conducted in Wuhan, China,[6] of 6-year-old children that showed:

1. 22% brushed their teeth twice a day;
2. 39% of the children brushed once a day;
3. 39% brushed less often or never.

The American Academy of Pediatric Dentistry recommends cleaning children's teeth as soon as they erupt and using dental floss when adjacent teeth are touching.[26] Since many parents in the present study did not brush when they were children themselves, it was not surprising that they did not encourage this habit in their children, rendering their children more susceptible to caries.

Many children were weaned off the bottle at an older age. Prolonged bottle feeding is known to correlate with the development of rampant caries.[27] In addition, parents did not comprehend the necessity for regular dental exams and treatment. To recommend general anesthesia or sedation to parents posed an even greater challenge. Almost all parents interviewed heard frightening warnings from many sources about the potential harmful effects of general anesthesia. Although risks are involved with use of any general anesthesia or sedation method, the parents' main concern was that the anesthetic medicines would affect the development of the child's brain and intellect. Many parents who agreed with treatment decided to simply place their trust in the dental providers. Detailed explanations that will address parents' fears directly, accompanied by the availability of Chinese role models, could help ease their doubt and confusion and promote sound decision making.

A study of Latino immigrant parents[28] demonstrated a relationship between parental beliefs (eg, the unimportance of primary teeth) and the development of caries in their children. Similarly, the present study suggests that the Chinese community still holds many myths regarding dental treatment, for instance, that a child will not tolerate multiple extractions at once or that one can leave decaying baby teeth alone because they will fall out. A better understanding of these beliefs may help providers explain the goals, risks, and benefits of treatment to the parents as well as to their families, which play an important role in the decision making. Most parents did not know of other children who had received dental surgery at the time of their child's treatment. These parents can be described as "pioneers" in their community. After treatment was rendered, their views changed, and they understood the importance of regular recall exams and cleaning.

Concerted, multifaceted, culturally sensitive educational efforts on the part of both pediatricians and pediatric dentists will be needed to help change this situation. Parents who bring their children to the dentist may be more likely to accept dental recommendations and treatment. Educational materials in Chinese taking the above information into account could be made available in dental clinics for such parents. Prevention should also be stressed in programs such as those for prenatal women and those in preschool and elementary school settings. Pediatric dentists and pediatricians could also guide and support public campaigns to reach parents lacking knowledge of oral health care.

As previously stated, qualitative research offers a valuable way to investigate the thoughts and feelings of a specific population. It can help providers better understand patients' points of view so that communication and care can be improved. Of course, every form of research has its limitations. In the present study, because the interviewer was a dentist, interviewees might not have always answered with complete honesty. This was hopefully offset by the shared culture of interviewer and interviewee, her ability to conduct interviews in the preferred language, and the ability of interviewees to choose the location of the interview. Being Chinese, the interviewer was able to understand and enter deeply into the cultural world of the participants. The presence of the other 2 authors to help develop and modify the interview guide, teach skills of interviewing, participate in check coding, and discuss findings enhanced the validity of the research.

Finally, while the sample size is typical for qualitative research, it might not include all possible variations of thought and belief. The interviewers' conviction, however, was that saturation was achieved (ie, that no new themes were emerging in the final interviews). The present authors recommend that a survey be developed and circulated to a larger sample of Chinese immigrants to further validate these findings.

This research project has allowed many parents to share their thoughts and attitudes on dental treatment, general anesthesia and sedation, and cultural beliefs. Pediatric dental services provided to a multicultural society require much planning and understanding. In the 2002 College of Diplomates Symposium,[29] it was stated, "If you wish to help a community improve its health, you must learn to think like the people of the community. Before asking a group of people to assume new health habits, it is wise to ascertain the existing habits, how these habits are linked to one another, what functions they perform, and what they mean to those who practice them."

The responses given by parents in this study should help providers to understand Chinese people and their views on dental treatment. First, providers can better understand why many of these children had multiple caries. Second, providers and health care workers could learn how to improve their approach to treating this population, from giving oral hygiene instructions and diet counseling to anticipatory guidance. Third, understanding cultural beliefs can help providers give more culturally sensitive care to these patients and better explanations to the parents. This would improve the relationship between the doctor and the patient, which ultimately optimizes the care rendered. Providers need to spend more time explaining prevention and treatment plans to parents. Parents should be taught why seeking dental care is important. Identification of role models in the community could also be of help.

Scientific evidence has shown that the development of EC is multifactorial. The present research has made us more aware of the attitudes that play a role in the development of EC. Parents overall were satisfied with the treatment rendered for their children. Generally, all the interviewees enthusiastically shared their thoughts and feelings on this topic. They felt that, if they could help others in the community understand how to improve the dental health of Chinese children, it was worth their time to participate in the research.

Conclusions

Using formal qualitative analysis, this study investigated the beliefs and attitudes toward dental care of Chinese parents of children referred to the operating room for treatment for extensive caries. Key findings included the following:

1. Regular dental care was not part of parents' experiences in their own childhood.
2. Many Chinese persons believe that the tooth cleaning done in dental offices loosens and scratches the teeth.
3. Children were expected to learn to brush on their own upon entering school.
4. Dental treatment tends to be sought only when children are experiencing oral pain.
5. Parents believed that primary teeth did not need to be cared for because they would fall out on their own.
6. Anesthesia and sedation were regarded with fear and were believed to adversely affect child development, mental capacity, and personality.
7. Social and familial relationships strongly encouraged acting on these beliefs.

The authors recommend concerted and coordinated efforts on the part of pediatric dentists and pediatricians to educate the Chinese community in culturally sensitive ways about preventive oral health care.

References

1. Ripa LW. Nursing caries: A comprehensive review. Pediatr Dent 1988;10:268-282.
2. Febres C, Echeverri EA, Keene HJ. Parental awareness, habits, and social factors and their relationship to baby bottle tooth decay. Pediatr Dent 1997;19:22-27.
3. Tinanoff N. The early childhood caries conference—October 18-19, 1997. Pediatr Dent 1997;19:453-454.
4. Seow WK. Biological mechanisms of early childhood caries. Community Dent Oral Epidemiol 1998;26:8-27.
5. Wong, MC, Schwarz E, Lo EC. Patterns of dental caries severity in Chinese kindergarten children. Community Dent Oral Epidemiol 1997:25:343-347.
6. Petersen PE, Esheng Z. Dental caries and oral health behavior situation of children, mothers, and schoolteachers in Wuhan, People's Republic of China. Int Dent J 1998;48:210-216.
7. Weinstein P, Troyer R, Jacobi D, Moccasin M. Dental experiences and parenting practices of Native American mothers and caretakers: What we can learn for the prevention of baby bottle tooth decay. J Dent Child 1999;66:85, 120-126.
8. Morse JM, Field PA. *Qualitative Research Methods for Health Professionals.* 2nd ed. Thousand Oaks, Calif: Sage Publications; 1995.
9. Elder NC, Miller WL. Reading and evaluating qualitative research studies. J Fam Pract 1995;41:279-285.
10. Greenhalgh T. Integrating qualitative research into evidence-based practice. Endocrinol Metab Clin North Am 2002;31:583-601, ix.
11. Kuzel AM, Engel JD, Addison RB, Bogdewic SP. Desirable features of qualitative research. Fam Pract Res J 1994;14:369-378.
12. Miller WL, Crabtree BF. Qualitative analysis: How to begin making sense. Fam Pract Res J 1994;14:289-297.
13. Ryan K, Denz-Penhey H. Qualitative research in medical practice. N Z Med J 1996;109:87-88.
14. Meadows LM, Verdi AJ, Crabtree BF. Keeping up appearances: Using qualitative research to enhance knowledge of dental practice. J Dent Educ 2003;67: 981-990.
15. Williams AC, Bower EJ, Newton JT. Research in primary dental care. Part 6: Data analysis. Br Dent J 2004;197:67-73.
16. Giacomini M, Cook DJ. A user's guide to qualitative research in health care. JAMA 2000;284:478-482. Available at: http://www.cche.net/text/usersguides/qualitative.asp. Accessed November 28, 2005.
17. Brown JB, Sas G. Focus groups in family practice research: An example study of family physicians' approach to wife abuse. Fam Pract Res J 1994;14:19-28.
18. Kitzinger J. Qualitative research. Introducing focus groups. BMJ 1995;311:299-302.
19. Britten N. Qualitative interviews in medical research. BMJ 1995;311:251-253.
20. Crabtree BF, Miller WL. A qualitative approach to primary care research: The long interview. Fam Med 1991;23:145-151.
21. Mays N, Pope C. Observational methods in health care settings. BMJ 1995;311:182-184.
22. Searight HR, Campbell DC. Ethnography and family medicine: Issues and overview. Fam Pract Res J 1992;12:369-382.
23. Ventres WB, Frankel RM. Ethnography: A stepwise approach for primary care researchers. Fam Med 1996;28:52-56.
24. Miles MB, Huberman AM. *Qualitative Data Analysis: An Expanded Sourcebook.* 2nd ed. Thousand Oaks, Calif: Sage Publications; 1994.
25. Kaptchuk TJ. *The Web That Has No Weaver.* 2nd ed. Chicago, Ill: Contemporary Books; 2000.
26. American Academy of Pediatric Dentistry. Clinical guideline on infant oral health care. Available at: http://www.aapd.org/media/Policies_Guidelines/G_InfantOralHealthCare.pdf. Accessed November 28, 2005.
27. Schwartz SS, Rosivack RG, Michelotti P. A child's sleeping habit as a cause of nursing caries. J Dent Child 1993;60:22-25.
28. Watson M, Horowitz AM, Garcia I, Canto MT. Caries conditions among 2- to 5-year-old immigrant Latino children related to parents' oral health knowledge, opinions, and practices. Community Dent Oral Epidemiol 1999;27:8-15.
29. Scrimshaw SC. Our multicultural society: Implications for pediatric dental practice. Pediatr Dent 2003;25:11-15.