Scientific Article

A Conceptual Model of Parental Behavior Change Following a Child's Dental General Anesthesia Procedure

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Abstract: ***Purpose:*** *The purpose of this study was to investigate parents' challenges to long-term maintenance of healthy behaviors following their child's dental general anesthesia (GA).* ***Methods:*** *Twenty-six in-depth interviews were conducted with parents of children younger than 6 years of age who had dental treatment under GA. The interviews were scheduled at various time periods following the surgery. Compared were the responses of: (1) "relapse" families, whose child had new cavities at the 6-month recall; and (2) "no relapse" families, who were caries-free at recall. A grounded theory approach to data analysis was used.* ***Results:*** *"Relapse" parents: (1) valued baby teeth differently; (2) perceived their child to be less susceptible to new cavities; and (3) expressed lower self-efficacy for controlling their child's oral health compared to "no relapse" parents. They also appeared to be: (1) in earlier stages of change; (2) less receptive to advice from others, including professionals; and (3) more permissive regarding their child's desires. "Relapse" parents did not seem to have any immediate plans to change their "home-care" behaviors.* ***Conclusion:*** *GA did not appear to affect long-term preventive behaviors for all parents. Readiness to change seemed to be an important predictor of whether parents adopted and maintained preventive behaviors to improve their child's oral health. (Pediatr Dent 2007;29:278-86)*

KEYWORDS: QUALITATIVE RESEARCH, DENTAL CARIES, PREVENTION AND CONTROL, HEALTH BEHAVIOR, PARENTING

Children with a history of early childhood caries (ECC) are susceptible to the development of new caries, even after comprehensive oral rehabilitation under general anesthesia (GA).[1,2] Retreatment rates have been reported as high as 50% at the 6-month recall.[2] Many investigators have attempted to identify the factors associated with caries relapse after GA dental treatment.[1,3,4] Few, however, have explored the effect of the GA dental treatment itself on changing parental behaviors that might lead to improve child oral health.[5,6] Understanding the factors that influence positive change in parent's health behaviors will enable the selection and design of those strategies most likely to be effective in controlling caries and caries relapse.

Many theories of health behavior change, such as the health belief model (HBM), hypothesize that 4 motivating factors/perceptions determine the likelihood of adopting a recommended preventive health action.[7] These include the perception of: (1) susceptibility to disease; (2) perseverance of a disease; (3) benefits of taking action; and (4) barriers to taking action. This approach is, however, likely too simplistic. To understand parental behaviors, other factors in addition to these motivating factors need to be considered, such as: (1) ethnicity; (2) culture; (3) family socioeconomic status; and (4) environment.[8] Another model that has relevance for understanding parent's health promoting behaviors for their child is the transtheoretical model (TTM).[9] This model proposes that behavior change occurs as individuals progress through a series of "stages of change," ranging from pre-contemplation (no consideration of change in the immediate future) through maintenance, the stage in which behavior change has been made and maintained. Therefore, to move individuals along the continuum of stages of behavioral change, it is critical to understand and identify the individual's stage of "change and then to develop "stage-appropriate" intervention strategies and techniques.

A parent's readiness to change may be closely connected to her style of parenting. Two important elements of parenting that have been described are parental responsiveness and "demandingness."[10] Parental responsiveness refers to the extent to which parents intentionally encourage individuality and self-regulation by being supportive and accepting of their child's demands.[11] Parental "demandingness" (ie, behavioral control) refers to parents': (1) demands; (2) supervision; (3) disciplinary efforts; and (4) willingness to

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challenge their child.[11]

Based on these 2 elements, 4 parenting styles have been defined:[11]

1. Permissive parents, who are more responsive than they are demanding. They: (a) do not require mature behavior; (b) allow considerable self-regulation; and (c) avoid confrontation.
2. Authoritarian parents, who are highly demanding and directive, but not responsive. They expect orders to be obeyed without explanation.
3. Authoritative parents, who are both demanding and responsive. They teach and supervise clear standards for their child's behaviors. Their disciplinary methods are supportive, rather than punitive.
4. Uninvolved parents, who are low in both responsiveness and demanding nature.

While parenting styles reflect different naturally-occurring patterns of parental beliefs, attitudes, and behaviors, a parent's stage of change may further enhance or retard their determination to influence their child's oral health.

Most previous analyses of parental oral health beliefs and behaviors have been quantitative studies.[12,13] An exploratory qualitative approach may provide insight into the motivators and barriers to behavior change, as reported by parents, and will improve our understanding of strategies to facilitate change in parental behaviors. Such information may support dental professionals to better resolve parental ambivalence about changing behaviors related to their child's oral health.

We have previously reported our findings on parents' experiences of their child's GA dental treatment and on parents' immediate behavior changes after the GA.[14,15] The purpose of this paper was to explore:

1. parents' challenges to long-term success in maintenance of healthy behaviors for their child; and
2. the responses of parents of: (a) children with new caries; and (b) "caries-free" children at the 6-month follow-up.

Methods

Approval for the study was received from the behavioral research ethics board of the University of British Columbia, British Columbia, Canada. Participants were parents from a variety of ethnic backgrounds whose children had recently been treated under GA in a pediatric dental practice with an on-site GA suite. Although the dental centre was a private practice, the costs of treatment for many of the children, either with or without GA, were partially or fully supported by publicly funded programs.

All referrals by general dentists to this specialty practice were due to the child's behavior and need for extensive dental rehabilitation, which included extraction of teeth and restorative dentistry. Only parents of preschool-aged children with no relevant medical history were recruited to the study. Parents were approached at their child's GA appointment. Of the parents approached to participate, a small number refused because of time constraints. Interested parents were interviewed individually at various time periods following the surgery. Interviews were performed either in a quiet area of the dental office or in the child's home.

Eighteen interviews were conducted in English by the first author (MA) using an interview guide (Table 1). Following each interview, the interview guide was modified as necessary in an iterative fashion based on responses. Because of the considerable proportion of Chinese families treated in this clinic, a Chinese-speaking dental student interviewed Chinese families who preferred to be interviewed in their native language. The consent form and the recruitment flyer were translated into Chinese and subsequently back-translated. All 8 interviews were translated into English for analysis. The correctness of translations was verified by another bilingual Chinese individual. The interviews lasted 25 to 60 minutes. Recorded in a short questionnaire was information on: (1) demographics; (2) child's feeding; and (3) child's dental history. At the end of each interview, $25 was given to each participant.

Table 1. INTERVIEW QUESTIONS

AT THE GENERAL ANESTHESIA FOLLOW-UP APPOINTMENT:
1. How would you describe a healthy mouth? What do you know about baby teeth?
2. What were you thinking and feeling when your child was asleep and being worked on by the dentist?
3. How is your child doing after the dental work?
4. What did you learn from your experience?
6 TO 12 MONTHS AFTER GENERAL ANESTHESIA:
1. Why did your child have or not have new cavities at this time?
2. What difficulties have you had in following preventive suggestions such as controlling your child's diet or brushing your child's teeth? How did you deal with these difficulties? What helped you?
3. If you had to start again from the day your child got her/his first tooth, what would you do differently?

All interviews were: (1) audio-taped; (2) transcribed; (3) checked; and (4) coded using the Nvivo software program (QSR, Australia). An overall goal of the research was to

eventually generate a conceptual model based on the content of the interviews. Therefore, the approach to data analysis was grounded theory.[16] As the research progressed, 63 codes were identified and grouped under 6 main categories. Linkages were made among categories and subcategories. Data collection and analysis were done simultaneously. Saturation of categories was attempted using a constant comparative approach to look for examples that represented the category. Each category that was reasonably full was considered to be a saturated category. Interviewing continued until new information did not provide further insight into the category.

Fifteen of the interviews were performed 7 to 14 days following the surgery. After 6 months, the charts of all children from the original 15 families were reviewed and the number of new carious lesions at 6-month recall were recorded. Families whose child was caries free at the 6-month recall appointment were termed to be "no relapse." Families whose child had at least 1 new carious lesion at recall or families who had more than one child who had undergone GA for dental treatment were categorized as "relapse." The first set of parents, cohort A, was invited to a second interview 6 to 12 months after the GA to: (1) explore the long-term effect of the GA; and (2) better understand parents': (a) differing journeys following their child's GA; and (b) their attempts to maintain the healthy behaviors over time.

Based on parents' availability and acceptance, 8 of the original 15 parents (5 "no relapse" and 3 "relapse") were interviewed again 6 to 12 months after the first interview. Because of the poor response from the "relapse" parents in cohort A, another cohort of parents—cohort B—was interviewed. Cohort B's children were in need of a second GA because of new caries, but had not been part of the first cohort. The responses of the "no relapse" families and the "relapse" families were further analyzed and compared. In total, 26 interviews were completed before data was determined to be saturated.

Results

Nineteen parents (15 mothers and 4 fathers) participated. Basic demographic information for the 19 families is outlined in Table 2. Six categories that helped explain similarities and differences between the "relapse" and "no relapse" families were identified: (1) parents' dental beliefs; (2) experience of GA; (3) outcome of GA; (4) behavior change; (5) parenting style; and (6) advice to other parents.

Parents' dental beliefs. Most parents valued dental health. They described a healthy mouth as "having no cavities at all." All parents had a basic understanding of causes of dental decay, which included factors such as: (1) consumption of sugary foods; (2) inadequate oral hygiene; (3) general health; (4) genetics; and (5) lack of access to fluoridated water. Only the Chinese families talked about bacteria as a major risk factor for dental decay. Parents in the "relapse" group suggested that having cavities was "normal." The "no relapse" group, however, did not seem to consider dental decay as an expected part of everyday life, although some of them said "it is acceptable because it's common" (Table 3). All parents expressed ambivalence and uncertainty about the benefits of preventive practices. In the words of one mother in the "relapse" group: "I think I should have done better; but it's not like saying if I had done very well, my son would not get any cavities." Extraction of a baby tooth was reported to be a serious matter by most parents.

Table 2. STUDY PARTICIPANTS

	No relapse (N=9)	Relapse (N=10)
Child		
Age (mean)	46.3 mos old*	49.4 mos old*
Gender	Boys=3, girls=6	Boys=7, girls=3
defs (mean)	25.1*	36.9*
Age bottle-/breast-feeding stopped	26.2 mos*	32.2 mos*
Parent		
Gender	Fathers=2, mothers=7	Fathers=2, mothers=8
Mother's age (mean)	36.9 ys old*	37.9 ys old*

* Because of the small sample size in qualitative research, statistics such as SD are not usually presented.

The "no relapse" group seemed to value baby teeth somewhat more than the "relapse" group (Table 3). The belief that "childhood decay is quite prevalent," however, was common to both groups. All parents agreed that baby teeth are important for a child's eating, speaking, and appearance. Only the "no relapse" group, however, generally acknowledged a relationship between healthy baby teeth and healthy adult teeth. While all parents suggested that baby teeth are more prone to dental decay than adult teeth, their explanations varied (Table 3). Nonetheless, most parents in the "relapse" group were "very surprised with their child having so many cavities at such a young age."

All parents in the "relapse" group and the Chinese families from the "no relapse" group appeared to have poor dental self-efficacy related to their child. This perception seemed to be related to the parent's: (1) own poor childhood dental care; (2) inadequate or incorrect knowledge; (3) limited fam-

ily income; and (4) external influences (ie, access to dental services and commercial products).

Although no parents reported their previous dental visits to be a pleasant experience, most of them were now regular dental patients. Dental avoidance by parents was not a finding.

Table 3. EXAMPLE QUOTES OF DENTAL BELIEFS OF PARENTS FROM "NO RELAPSE" AND "RELAPSE" GROUP

Dental beliefs	No relapse	Relapse
Dental caries "normal"	"Tooth decay is not normal, but very common, so it is acceptable."	"I think having a cavity is normal, as long as there aren't a lot of cavities. It's impossible to not have caries for life."
Dental self-efficacy*	"I think I am able to prevent cavities, because I have some family members who don't have any cavities at all."	"I know that the teeth can be kept for a lifetime. We can keep our teeth clean without any cavities, but I cannot."
Value to baby teeth	"I know that you have to care for the baby teeth, because if baby teeth start getting cavities, the adult teeth coming are affected."	"They're not permanent, so why bother? When the permanent teeth come out, then we should be careful."
Susceptibility to dental decay	Children get dental decay easier than adult because: "kids don't understand how to maintain their teeth," "parents have limited control on their child's diet and hygiene," and "cavities are more progressive in children."	Children get dental decay easier than adults because: "kids are careless and lazy," "kids have lots of sweets," and "kids don't brush."
Parental self-efficacy ‡	"Brushing her teeth still is a hassle; it is a lot of work; it is a big commitment; it is a lot harder than I thought, but I can do it, I have to do it."	"He doesn't let me brush his teeth; he wants to do it by himself. I try to help them, but they say "no." I cannot win with these kids."
Responsibility	"I know it's easier said than done, but we should realize that it's our responsibility and not the problem of the child."	"He's responsible, but he doesn't want me to brush his teeth. There was no difficulty in brushing his teeth, but I think he should learn how to do it by himself."

Quotes from individual parents are as close to their own words as possible.

* Dental self-efficacy is one's ability to control any kinds of dental problem.

‡ Parental self-efficacy is exercising control over the child so that the child will be healthy.

Experience of GA. Parents were generally troubled that their child needed GA. They reported fear and anxiety during the surgery. Most parents felt "guilty" and struggled to accept this mode of treatment for their child. While they commonly admitted that their child's serious condition was "more or less their fault," at the same time, they tried to comfort themselves by describing their trust in professionals: "Here, doctors are professionals. They are highly trained." Nonetheless, there were some parents from both groups who expressed no guilt. In addition, they were convinced that GA was the ideal—even preferable—way to complete their child's treatment and was superior to conventional treatment.

The perceived benefits of a child's dental treatment with GA were explained as: (1) all treatment in 1 appointment with "instant" relief of pain; (2) safe treatment; (3) minimal discomfort to the child; (4) no cooperation required; and (5) disease process stopped.

Parents also had concerns, however, about the side effects of the GA "medicine," as expressed by comments like: "He might not awaken after the surgery," or "it might affect my child's brain or his IQ." The cost of treatment was also mentioned as a concern (Figure 1).

Outcome of GA

Related to child. When parents' thoughts on their child's reaction to GA were explored, other than 2 mothers in the "relapse" group, most parents believed that their child did not remember the GA appointment itself (Figure 2). A child's increased interest in having good teeth after the surgery, however, was a frequent observation. While children were generally thought to be "happier" after treatment than before, parents of children who had teeth extracted complained that their child had immediate trouble with eating because of the missing teeth. Losing a number of teeth was a "shock" to many children; extraction of a tooth appeared to be a notable life event for young children and their families (Figure 2). At the 1-year interview, as parents had earlier predicted in their initial interview, most children were still not cooperative at follow-up dental appointments. GA dental treatment for most children had no effect on their cooperation level.

Related to parents. Most parents were satisfied with their child's dental treatment under GA and the outcome of the treatment. All parents acknowledged that they learned valuable lessons related to their child's oral health through the "GA experience." A new awareness of the importance of early dental visits and regular check-ups, however, was reported only by the "no relapse" group. Furthermore, only the "no

relapse" families talked about the GA as a "wake-up call" for both themselves and other caregivers to change their oral health behaviors.

Parents in the "relapse" group perceived their child to be less susceptible to new cavities because all teeth were now "fixed." They also felt that their child would now be more attentive to her/his dental health. The "no relapse" families, however, were more uncertain about their child's risk of "getting new cavities." While most parents preferred not to have another GA for any further treatment, some parents still preferred this mode of treatment (Figure 1). Nonetheless, the majority of parents had confidence in their dentist to make clinical treatment decisions in the best interests of their children: "… I (will) do whatever the dentist would recommend."

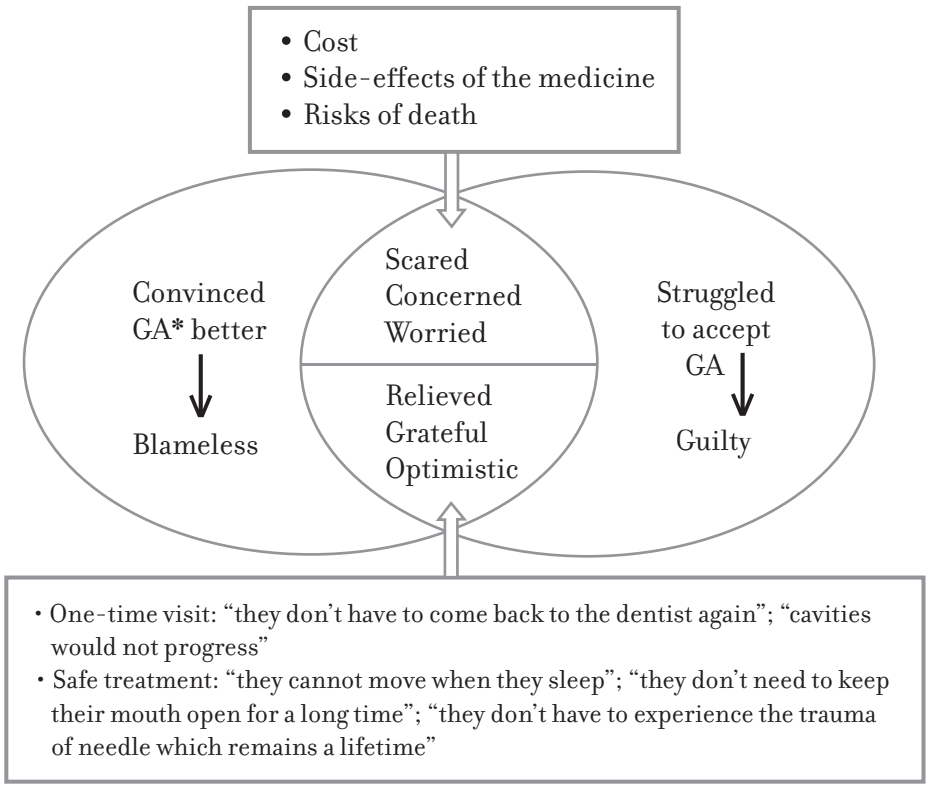

Figure 1. Parents' experience of their child's GA dental treatment.

* GA = General Anesthesia

Behavior change

Stages of change. The GA experience appeared to motivate most parents to take action and change oral health practices for their child immediately after the GA. Parents, however, seemed to be at different levels of readiness to be able to maintain positive changes over time. At the 1-year follow-up, most "no relapse" families still talked about the improvement in their child's oral hygiene and eating habits. Less progress was reported in diet and oral hygiene of children in the "relapse" group. "Relapse" families appeared to be more ambivalent about the advantages and disadvantages of consciously making a change in behavior: "Maybe I should stop giving them candies, I don't know. I cannot stop them. Maybe I should tell him to stop eating candies. I don't know if he accepts." They also expressed limited self-confidence in their ability to perform and maintain new behaviors in the face of difficulties. On the contrary, the "no relapse" families had already made specific and measurable modifications in their practices or were intending to take further action, as a mother of a 3½-year-old daughter explained: "I don't buy candies or pop around the house. They're not in my grocery list. I don't replace them all the time."

Barriers to change. Parents in both groups talked about their struggles with their child's homecare and the difficulties of taking their child to a dentist. Parents also complained about their child's unhealthy food choices and preferences. They also criticized commercialized food products that are high in sugar. Parents in the "relapse" group appeared to be less motivated to spend time and energy on their child's oral health, as demonstrated by the following comments: "I'm too lazy to brush his teeth every night;" "I'm too busy to …;" "I don't have enough patience to …;" or "I didn't pay any attention to his teeth." All parents felt they had limited knowledge and skills related to their child's oral health before and, even in some cases, following the GA experience.

While parents acknowledged the importance of brushing their child's teeth, they explained that they did/do not know how to brush a child's teeth: "No one ever taught me how to brush my child's teeth." In addition, the "no relapse" group had many other unanswered questions about things like the value of: (1) flossing their child's teeth; (2) children's toothpaste; and (3) fluoride treatment. Questions raised by the "relapse" group were mostly related to the occurrence of a cavity and the right age for a child's first dental visit. Parents admitted that dental decay is a problem that could be easily ignored. A mother of a 3½ year old girl said: "We're not trained professionals in children's teeth. If they're straight and white, then we presume everything is fine." Another mother similarly divulged: "Their teeth aren't quite the

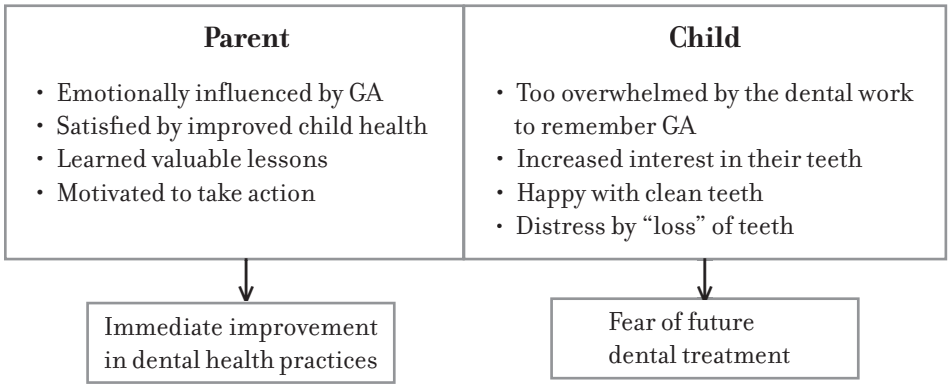

Figure 2. Short term outcomes of a dental general anesthesia (GA).

same as other body parts because you cannot see them."

Parents emphasized the importance of external encouragement to motivate them to follow recommended oral health behaviors. They stressed that information alone is not sufficient for action. A mother of 2 boys in the "no relapse" group suggested: "I knew about the first dental visit, but I put it behind my mind. They say that you should take your child to a dentist at 1 year, but nothing is implemented. I wish someone would call to remind me." All parents complained about the "conflicting information" they received from professionals about the right age for a child's: (1) first dental visit; (2) fluoride treatment; (3) snacking; and (4) breast-feeding practices.

Parents also mentioned the cost of dental care as a barrier to their own and their child's dental health. They admitted: "financial factors determine how often I see my dentist." Furthermore, just about all families had difficulties finding a dentist for their child before 3 years of age. They also suggested that some preventive recommendations are "unrealistic" and too complicated.

Supports for change. Dental professionals were praised as primary facilitators of change either through giving parents the required information alone or in conjunction with a hands-on demonstration of self-care techniques. Pamphlets available in hospitals or dental offices were suggested to be not as helpful as one-on-one counselling. Some parents clearly placed no value on receiving a "lecture" from a dentist and asked for more practical help in the form of interactive counselling visits. Only the "no relapse" group talked about the supports they received from the wider community such as: (1) children's TV shows; (2) brushing and snack-time programs at preschools; (3) books; and (4) newspapers, and the expectation and the judgment of modern society on "how well people care for their body." They also asked for: (1) educational videos; (2) pamphlets with pictures; (3) public awareness programs; and (4) government assistance for dental visits. No comments were received from the "relapse" group on community supports. They only asked for "free dental check-ups."

While the "no relapse" group had both positive and negative comments related to the influence of "significant others" on their child's oral health, the "relapse" group mentioned only the negative impact of: (1) grandparents; (2) babysitter; (3) friends; (4) families; and (5) "people" in general. A 34-year-old mother of 3 children—all of whom had GA dental treatment—said: "It's very hard to talk to people about their own children because they think they are doing what is the best for them." This belief could prevent parents from being open to "advice" from almost anyone. Most families in both groups, however, strongly believed that: "Parents are more receptive to the information exchanged between them because they have gone through the same experience." Parents talking to parents was a recommended way of communicating healthy behaviors.

Parenting style. Participating parents demonstrated 3 recognized parenting styles which were permissive, authoritarian, and authoritative style.[11] To avoid confrontation, many "relapse" families seemed to be more "permissive" regarding their child's desires. When trying to discipline their child, they often used an "authoritarian" style and expected their child to comply without any explanation: "I tell him, no, you're not going to school unless you brush your teeth properly, otherwise the dentist will pull out all your teeth and then he brushes again." While the "relapse" parents seemed at a loss as to how to control their child's diet or oral hygiene in the immediate future, the "no relapse" parents seemed to have already developed conscious plans to carry out healthy behaviors for their child's oral health. They also employed an "authoritative" approach with respect to their child's dietary habits and oral hygiene practices. The disciplinary methods used by this group were mostly based on explanations understandable to a child: "I don't like to bribe her, like 'if you want ice cream you must have broccoli first.' I'll tell her that she should eat broccoli first and then have ice cream because it will taste better." Whether their child was "caries-positive" or "caries-free" at recall, Chinese families appeared to be more permissive of their child's food choices and less motivated to promote healthy eating habits for their child.

Advice to other parents. When asked whether they would do anything differently if given a second chance, all parents acknowledged that: "I would brush my child's teeth more frequently;" "I would stop them eating sweets;" "I would stop the bottle earlier;" and "I would take them to a dentist more often."

Only the "no relapse" group said: "I would take my child to a dentist earlier, like at 9 months or a year, and not wait any longer."

Discussion

The etiology of ECC is complex, but parents' beliefs and behaviors about dental health and prevention may place a child at increased risk to both new caries and caries relapse. In the present study, an exploratory qualitative approach was employed to provide an in-depth understanding of parents' beliefs and behaviors as well as deeper insight into the motivators and barriers to behavior change, as reported by parents. Comparisons were also made between the "relapse" and "no relapse" group to explore parents' differing journeys following their child's GA and their attempts to adopt and maintain the necessary behaviors to prevent caries relapse and to improve their child's oral health.

The "GA experience" was defined as a set of events that were more than just the treatment appointment under GA. The "GA experience" collectively included the: (1) experience of referral; (2) consultation appointment; (3) "GA appointment"; and (4) parent's and child's reaction to these events.

We propose a conceptual model of parental behavior change in Figure 3. The component elements of the model describing the process of change emerged from the data collected in this study.

Parents' beliefs about oral health. Several factors related to parents' general beliefs and attitudes about oral health were identified in the interviews. The 4 motivating factors proposed by the HBM were: (1) perceived susceptibility to dental caries; (2) perceived seriousness of losing teeth; (3) perceived costs; and (4) benefits of prevention. These did not appear to be directly related to occurrence of caries relapse. For example, although the "relapse" group seemed to be certain that dental decay was normal, the "no relapse" group expressed more or less the same point of view (Table 3). These shared beliefs may explain why both groups of children developed caries in the first place.

Parents, however, had differing viewpoints about "baby teeth." Although many parents appeared not to be aware of the value of baby teeth prior to the GA, most "no relapse" parents recognized their importance as a result of the "GA experience." They talked of the valuable lessons that they learned about the: (1) potential risks of carious teeth; (2) relationship between baby teeth and adult teeth; and (3) importance of preserving baby teeth. Parents in the "relapse" group, however, still seemed to cling to the belief that baby teeth were really not as important as adult teeth. This difference in attitude will likely affect the effort each parent might devote to preserving baby teeth, even after the GA.

Parental belief about their abilities to control their own and their child's oral health is also a motivating factor in the adoption of health-promoting behaviors.[17] In the present study, "relapse" group parents seemed to be more ambivalent about their ability to control dental decay (ie, dental self-efficacy) compared to "no relapse" group parents. They also appeared to have lower "parental self-efficacy" related to controlling their child's oral health than the "no relapse" group. As the result, while the "no relapse" parents took responsibility and admitted the blame for the state of their child's teeth, parents in the "relapse" group seemed to attempt to absolve themselves of responsibility and to blame the child or even the professionals for the problem.

Behavior change. The general anesthetic experience was troubling in a variety of ways for almost all parents and children. It had enough impact to immediately motivate parents to consider changing their behaviors related to their child's dental health; in other words, it was a "cue to action." In fact, an "early" outcome of the GA was a reported improvement in parent's and child's dental health practices.[14] While behavior change is initiated by motivating factors and reinforced by "cues to action," it is readiness to take action based on a balance of health-related beliefs and environmental factors, which may have the greatest impact on changing and eventually maintaining a behavior.[18]

In the present study, despite the initial enthusiasm for change and immediate improvement of parents' and their child's oral health behaviors, it was only those families furthest along the stages of change continuum that maintained positive behaviors over time. Parental readiness to change is a known determinant of the maintenance of health-promoting behaviors and of changing existing unhealthy behaviors.[18] Parents in the present study differed on a number of dimensions related to how they perceived the "costs and benefits" of behavior change for their child's oral health and their ability to establish long-term change.

Parents of the "relapse" children appeared to be at the earlier stages of change (precontemplation or contemplation stage). They had not yet resolved their ambivalence about the costs and benefits of behavior change and had a lower sense of self-efficacy than other parents. On the contrary, the "no relapse" group seemed to be in preparation or action stages of change. They saw the benefits of behavior change and considered themselves to be capable of protecting their child from caries relapse. All parents talked about similar barriers to change. "No relapse" group parents, however, seemed to be more determined to find a way to eliminate and overcome the barriers and were more receptive to receiving support from others.

Parenting style. Parents develop different styles to cope with their parenting struggles. Most parents use a combination of

styles. One style, however, usually predominates.[19] An authoritative parenting style has been shown to be one of the most consistent predictors of healthy family behaviors.[20] In the present study, the "no relapse" families fostered a more authoritative style to promote their child's oral health compared to the "relapse" families. Controlling a child's eating habits, however, was found by all parents to be more difficult than brushing a child's teeth. Controlling a child's eating habits is a common parenting "battle" with respect to both the dental and general health of a child.[21]

Supports to change. In the present study, most parents admitted that they were deficient in their knowledge before GA. All reported a better understanding of caries risk factors after the "GA experience," however, and felt confident in the adequacy of their new information.[15] Nonetheless, new healthy behaviors did not seem to last for all parents simply as a result of increased knowledge. In other words, providing information is not sufficient to lead parents to improve and maintain their oral health behaviors in order to protect their child from relapse.[22] This finding is not new, but is often forgotten.

While parents expressed different levels of attention and interest in their child's oral health, repeated challenges to doing the "right thing" were raised by both the "relapse" and "no relapse" group. Parents emphasized that they needed more support from dental and nondental professionals to handle these challenges and maintain their new healthy behaviors. They remarked on the importance of a reminder letter or telephone call to encourage them to attend for an early dental visit. Encouragement by physicians and nurses may improve parents' compliance to an early dental visit and regular check ups.

Parent-centered counselling. Parents seemed to be requesting a family centered, supportive, brief counselling approach rather than the standard "lecture" or advice from the professionals, which most parents found to be both "complicated" and "unrealistic." Parents are at different stages of change; therefore, counselling by professionals should be individually tailored to a parent's stage of change rather than given with the expectation that all parents are ready for action-oriented strategies.

Motivational interviewing (MI) is a method for enhancing parents' intrinsic motivation to change by exploring and resolving their ambivalence. This approach is congruent with principles of family centered care, recognizing that the family is the expert for what is best for the child. It assists parents to examine and resolve their ambivalent feelings about preventive practices and avoids the so-called "complicated" advice that professionals might suggest. Although the evidence is at an early stage, motivational interviewing is a promising behavioral intervention that dental professionals should consider to enhance the effectiveness of preventive strategies.[23,24]

Study limitations. This research has several limitations. First, similar to any qualitative study, findings cannot be generalized to the general population. This study, however, provided insights into a range of opinions and comments of parents from a variety of cultural backgrounds. In addition, both mothers and fathers were invited to participate in the study. Although most of our participants were mothers, the 4 volunteer fathers were welcomed into the study. Furthermore, even though the families were patients of a private dental practice, they represented a range of socioeconomic backgrounds. The participant families had varying levels of dental insurance coverage for the costs of treatment. Nonetheless, our findings are limited to the specific group of families who were treated in this private dental practice.

The second limitation was that the children were grouped into the "no relapse" and "relapse" group based on the presence of any carious lesions (radiographic and/or visible caries) at the 6-month recall. Caries is a continuum, however, and the diagnostic tests for caries, visual exams, and radiographic exams used in this study are inherently imprecise. Thus, it is acknowledged that the "no relapse" group may get caries in the future, but the "relapse" group demonstrated an increased rate of caries by having detectable carious lesions as early as the 6-month follow-up.

A third limitation was that the number of second interviews with "relapse" families from cohort A was not as high as hoped because families could not be contacted by telephone or by mail, or because they repeatedly failed to show up for a second interview. To increase the number of follow-up interviews, a new group of parents, cohort B, was added to the study. The three "6-month-plus" post GA interviews with the new "relapse" families of cohort B enabled saturation of the data.

Conclusions

Based on this qualitative study's results, the following conclusions can be made:

1. Although an "early" and positive outcome of the general anesthesia experience was a reported improvement in dental health practices, it did not appear to affect long-term preventive behaviors for most parents.
2. Readiness to change seemed to be an important predictor of whether parents engaged in preventive methods and maintained the acquired healthy behaviors over time.
3. Oral health counselling should include an assessment of parental readiness.

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