

**UNDERSTANDING CHANGE IN PARENTAL DENTAL HEALTH  
BEHAVIOURS FOLLOWING GENERAL ANESTHETIC DENTAL  
TREATMENT**

by

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## ABSTRACT

The purpose of this study was to explore the experience of parents whose young children had had a general anesthetic (GA) for dental treatment and to develop a model to describe and explain parental behaviour change following the GA experience. A grounded theory method was undertaken to investigate 1) parent's beliefs and behaviours that may place their child at risk to new caries following the GA experience, 2) parents' experience of their child's dental treatment under GA and 3) the factors affecting parental adoption and maintenance of dentally healthy behaviours.

Twenty-six in-depth individual interviews were conducted with parents of pre-school aged children at various times after the GA, i.e. shortly after the GA and up to one year following the GA. Data were analysed with a grounded theory approach. to develop a model that was "grounded" in the data.

A conceptual model was generated to explain the process of parental behaviour change. Social influences, family context, and parental strategies were identified as key categories. Cultural beliefs, actions of dental professionals, and media/advertising were barriers for parents to adopt healthy behaviours. Not all parents were receptive to social supports; cross-cultural differences were apparent. Overall, the GA dental experience had enough of an impact to immediately motivate parents to consider changing their behaviours. However, difficulty and only partial compliance in following recommendations were frequently mentioned.

Although parental strategies were influenced by family context and social influences, the central position of parental strategies in the model gradually emerged. Parents who took

responsibility for their child's state of health felt guilt and were determined to develop strategies to overcome the barriers in applying healthy behaviours. Parents who had a high level of self-efficacy and were furthest along the stages of change continuum were likely able to engage in and maintain new healthy behaviours.

Although an early, positive outcome of the GA was a reported improvement in dental health practices, the GA did not appear to affect long-term preventive behaviours for many parents. Parental strategies were recognized as the core category of the final model that influenced whether parents adopted dentally-healthy behaviours and maintained these behaviours over time.

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*and my parents*

*Whose support and sacrifice made possible*

*my dedication*



**CHAPTER I**  
**EARLY CHILDHOOD CARIES**

In this chapter, I define early childhood caries (ECC) and present selected recent research about the prevalence, aetiology, and management of this multi-factorial disease. This chapter is not an exhaustive review of all of the extensive research devoted to ECC in recent years, but those papers more relevant to the focus of the present study will be discussed.

### **1.1 Definition**

Extensive dental decay in preschool children, or “early childhood caries” (ECC), is a troubling child health problem that can have a profound effect on a child. According to the American Academy of Pediatric Dentistry,<sup>1</sup> “ECC is the presence of 1 or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child less than 6 years of age.” ECC develops rapidly, often soon after teeth erupt, and it involves tooth surfaces which are usually only minimally affected by caries.<sup>2</sup> “*Nursing caries*”, “*nursing bottle caries*”, and “*baby bottle tooth decay*” were some of the original terms given to this disease. These terms suggest that inappropriate feeding habits are the main cause of ECC, while current evidence clearly indicates that the relationship between bottle-feeding habits and caries is not absolute.<sup>3</sup> Although the term ECC is not descriptive in terms of risk factors, characteristics or prevention of the condition, it is the currently used terminology.

The potential consequences of ECC are acute and chronic pain; interference with a child’s eating, sleeping, and proper growth; tooth loss and malocclusion; increased expense for dental care throughout life and compromised general health.<sup>4</sup> In addition, children who experience ECC continue to be at high risk for new caries as they get older, both in the primary and permanent dentitions.<sup>5</sup>

## **1.2 Prevalence**

Despite the general reduction in the prevalence of dental caries in industrialized countries, children from disadvantaged communities and minority ethnic groups continue to experience high disease levels.<sup>6</sup> An estimated 80% of caries is said to be found in just 25% of children.<sup>7</sup> Within non-industrialized countries and disadvantaged populations in industrialized countries, the prevalence of ECC is reported to be as high as 70%.<sup>6</sup> Canadian studies have reported a prevalence of less than 5% in the general population<sup>8,9</sup> and from 50% to 80% in high risk groups,<sup>10-12</sup> including immigrants and aboriginal Canadians. One cross-sectional study that investigated the oral health of ninety-eight, 3 to 5 year old children in a First Nations community in northern Manitoba, Canada, reported that 98% of the children had ECC.<sup>13</sup> In British Columbia, in 1998, an oral health screening of all 5-year old kindergarten children performed by public dental health staff reported that one in ten children had evidence of decay on their maxillary primary incisors.<sup>14</sup>

Because of the diversity in the ages of children examined, the inconsistency of the definition used for ECC, and the lack of control for other factors such as access to fluoridation and dietary practices, finding a true prevalence for this disease is challenging. Nonetheless, from these statistics, it is evident that ECC is a serious health problem that demonstrates an alarming prevalence among children.

## **1.3 Aetiology**

Dental caries is an infectious disease. The main factors in the aetiology of the disease are cariogenic bacteria, fermentable carbohydrates, a susceptible host, and time.<sup>15</sup> However, in young children, the bacterial flora and host defence systems are still in the process of development. Tooth surfaces are newly erupted and may have subclinical hypoplastic

defects.<sup>15</sup> Therefore, young children have unique risk factors for early caries. The aetiology of ECC has been described in a number of review papers.<sup>15-17</sup> In a systematic review of the literature on risk factors for dental caries in primary teeth of children aged six years and under, Harris *et al.* (2004) identified 106 factors significantly related to the prevalence or incidence of ECC in the 73 studies included. The important factors that emerged across the different types of studies were: oral microflora, diet, enamel hypoplasia, oral hygiene, and ethnicity.<sup>16</sup>

Therefore, based on the available evidence, early acquisition and high levels of *S. mutans*, frequent exposure to fermentable carbohydrates and developmental defects on primary teeth have been identified as the most important *biological* risk factors for ECC.<sup>16</sup> In addition, *non-biological* factors including inappropriate feeding habits (prolonged breast- or bottle-feeding), ethnicity, living in low socioeconomic environments, and parental stress have also been found to play an important role in the aetiology of ECC.<sup>16, 17</sup> However, little is known about the impact of parental beliefs and attitudes on their child's dental health.

### **1.3.1 Biological risk factors**

#### **1.3.1.1 Microflora**

Cariogenic micro-organisms colonize the oral cavity as soon as hard dental tissue is present.<sup>18</sup> Conventional culturing methods have been used to show that well-known species, such as *Streptococcus mutans* and *Lactobacillus* are associated with dental caries. More recently, advanced molecular methods of bacterial identification, such as Polymerase Chain Reaction (PCR) techniques and 16S rRNA gene sequencing analysis, have become available and have revealed that the bacterial involvement in the

development of early childhood caries is more complex than previously believed.<sup>19</sup> In an attempt to identify the bacteria associated with ECC in a group of children aged 1.5 to 7 years old, the top bacterial species found to be overabundant were *Actinomyces*, *Streptococcus mutans*, and *Lactobacillus*.<sup>19</sup> These bacteria are transmitted from the primary caregiver, usually the mother, to the infant via the mother's saliva by kissing the child directly on the mouth or pre-testing food before giving it to the child.<sup>20</sup>

The age at which the bacteria first colonize a child's teeth is a factor in predicting caries activity at later age. Children whose teeth are colonized earlier demonstrate higher caries experience than those colonized later or not at all.<sup>21</sup> Most studies including pre-dentate children suggest that the initial acquisition of *S. mutans* coincides with the emergence of the first primary tooth.<sup>18</sup> The explanation is related to the fact that *S. mutans* generally require a non-shedding smooth surface to colonize.<sup>22</sup> The infection rate of *S. mutans* increases with age because of the increasing number of retentive sites (teeth) for bacterial colonization.<sup>23</sup> Although microflora have proven to be necessary for occurrence of ECC, microorganisms alone are not sufficient to develop clinical disease.

#### **1.3.1.2 Diet**

Diet plays a major role in the development of dental caries. Frequent and prolonged oral exposure to fermentable carbohydrates is fundamental to caries activity.<sup>24</sup> The bacteria on the teeth utilize carbohydrates in their glycolytic pathways to produce energy, and acid is a by-product of this metabolism.<sup>25</sup> Consequently, the dental plaque pH falls to a point that leads to demineralization of enamel.<sup>26</sup> Frequent exposure to carbohydrates maintains the plaque pH below the critical point of pH 5.5. These repeated acid attacks over a period of time cause dental caries. One example of high-frequency carbohydrate consumption is

prolonged or night-time bottle feeding which is a commonly-observed feeding behaviour in children with ECC.

The form of the carbohydrate is another critical factor in the cariogenicity of foods. Products that are sticky and retained for long periods in the mouth have a higher cariogenicity than foods that are eliminated quickly. Other investigators who have examined the effects of the consistency (retentiveness) of sugar on the rate of dental caries have demonstrated that the addition of sugar to the diet caused increased caries activity, but the degree of activity was dependent on the consistency of the sugar.<sup>27</sup> In addition to retentiveness, oral clearance of carbohydrates by saliva also makes a significant contribution to ECC. During sleep, the flow rate of saliva is low, increasing the length of contact time between plaque and substrate. Therefore, the cariogenicity of the substrate increases significantly.<sup>28</sup> Some investigators have reported that the benefit of frequent toothbrushing did not outweigh the damaging effect of frequent sugar consumption.<sup>29</sup> However, other investigators have concluded that for children who brushed their teeth twice a day with a fluoridated toothpaste, consumption of sugars and sugary foods did not appear to be associated with caries.<sup>30</sup> These differing conclusions may be because most of the studies relied on parent's recall of dietary habits rather than using standardized and validated questions.

#### **1.3.1.3 Developmental defects of primary teeth**

Final maturation and hardening of the enamel of primary teeth are completed some time after eruption, when ions such as fluoride are incorporated into the enamel.<sup>31</sup> Therefore, the immediate period after eruption and before final maturation of the teeth is when these

teeth are most susceptible to caries. Developmental enamel defects such as enamel hypoplasia may predispose the primary teeth to plaque retention and caries risk. An increased prevalence of hypoplasia in some children with ECC has been demonstrated.<sup>32</sup>  
<sup>33</sup> However, whether enamel hypoplasia, present at the subclinical level in infants, poses a significant risk factor for ECC needs further confirmation. In summary, the major biological factors that contribute to ECC are a combination of high concentration of oral microflora, frequent intake of fermentable carbohydrates, and immature newly erupted teeth. While biological factors are necessary for ECC, they are not the only predisposing factors.

The significance of non-biological factors was demonstrated by a randomized no-treatment controlled trial that we conducted over a 2-year period at a private dental practice.<sup>34</sup> The specific aim of this study was to determine the effect of an antibacterial agent (Betadine) on *Streptococcus mutans* and on the incidence of new caries in young children following dental rehabilitation under GA. At baseline and 6-month recall, both experimental and control children received a dental exam and a mouth swab was taken from all children. Children in the experimental group had 3 additional appointments for application of Betadine. Although all children's *S. mutans* counts decreased significantly at 6 months ( $P=0.003$ ), about 30% of the children developed new carious lesions at one-year follow up.

Another interesting and, not entirely, unexpected observation was that the longer a mother had lived in North America, the more likely her child's *S. mutans* counts had substantially decreased at 6-month recall ( $P=0.03$ ). Dental knowledge, oral hygiene and

feeding practices of the mother, the main reservoir of cariogenic bacteria as well as the main caregiver of the child, have been identified as important behavioural factors in early childhood caries.<sup>17</sup> The knowledge and skills of the mother about her own dental health, self-care and care of her child are the products of her culture and the family structure. Access to oral health education and community-based interventions, plus better availability of dental services in Canada, may help explain the differences in salivary counts of mutans bacteria. Furthermore, the increased stress experienced in families because of the financial and social instability associated with immigration may have been a contributing factor to less than optimum oral health practices.

However, in our Chinese families, when the mean length of time that mothers had been in Canada was compared for children whose mutans decreased with children whose mutans had not changed, the difference was not significant ( $P=0.79$ ). Perhaps Chinese parents tend to keep their traditional health behaviours long after immigration and are less affected by oral health promotion programs. These findings suggest the important role for non-biological risk factors like social and behavioural factors in a child's risk to ECC or caries relapse after comprehensive dental treatment.

### **1.3.2 Non-biological risk factors**

#### **1.3.2.1 Inappropriate feeding patterns**

##### **1.3.2.1.1 Bottle-feeding**

Severe caries in preschool children previously described as "*nursing caries*" or "*baby bottle tooth decay*" has been attributed to prolonged and frequent bottle feeding. Children with ECC often have a history of sleeping with a bottle or using a bottle beyond the recommended weaning time,<sup>35</sup> but not all children who sleep with a bottle develop ECC.<sup>3</sup>



In one U.S. study involving children in a Head Start infants program, 86% of children with caries of the maxillary incisors were reported to have taken a bottle to bed. However, surprisingly, 69% of those who did not have maxillary anterior caries also repeatedly took a bottle to bed.<sup>36</sup> In another study, 90% of children were bottle-fed between 12 and 18 months of age, yet the prevalence of ECC was only 20%.<sup>37</sup> However, measurement of bottle-feeding habit among infants and children is complex and difficult to accurately quantify and there is no consistent definition for this habit in the literature. Various definitions have been used by different studies including: "put a child on the bed with a bottle", "given a nursing bottle prior to sleep", "finished the content of the bottle before falling sleep", "sleeping with a bottle in the mouth", "bottle-feeding on demand". It is unfortunate that these studies did not measure bottle use in a consistent manner.

In addition to the time, frequency, and duration of bottle-feeding, the contents of the nursing bottle is another issue related to ECC. Cow's milk is the most common beverage placed in a baby's bottle;<sup>38</sup> however, from the literature, there is no evidence to suggest that cow's milk is cariogenic. On the contrary, there is much evidence that milk is cariostatic.<sup>39</sup> In fact, it has been demonstrated that the risk of MS colonization appears lower among infants who consume milk rather than sweetened beverages in the bottle.<sup>18</sup> The same result has been reported for milk-based formulas. The main mechanism of protection afforded by milk is to increase the calcium and phosphate concentrations in the plaque and enhance the remineralization of enamel.<sup>40</sup> However, the cariogenicity of sweetened beverages including milk sweetened with sugar, fruit juices, and soft drinks is well-documented.<sup>41</sup> The physical presence of the nipple in the mouth may also have

negative consequences. The flow rate of the saliva on the palatal surfaces of maxillary teeth may be restricted by the presence of the nipple.<sup>42</sup>

Although, a number of studies have explored the different variables related to bottle-feeding such as time, frequency, duration, and content of the bottle, more studies are required to examine each variable individually. Furthermore, in order to precisely quantify infant feeding patterns, standard measures should be defined to enhance the comparability of the studies.

#### **1.3.2.1.2 Breastfeeding**

Another risk factor for ECC that is controversial is the potential cariogenicity of prolonged or night-time breastfeeding. In recent years, a number of systematic reviews have suggested that there is no scientific evidence proving that human milk can be associated with the development of caries.<sup>16, 43, 44</sup> Valitis *et al.* (2000) systematically reviewed 151 studies that investigated the association between breastfeeding and ECC. They found a moderate correlation between breastfeeding and ECC in only three studies. They verified that the quality of the studies was relatively poor and that the variables were difficult to compare because their definitions were weak, inconsistent, ambiguous, and even absent. For instance, they did not provide a clear definition for “breastfeeding on demand”, “exclusive breastfeeding, or “breastfeeding at night”.<sup>43</sup> In another systematic review on risk factors for ECC conducted by Harris *et al.* (2004), only three factors among 106 risk factors were related to breastfeeding: duration, frequency, and night-time breastfeeding.<sup>16</sup> Ribeiro and Ribeiro (2004) also conducted a systematic review to explore the association between breastfeeding and the development of ECC. They similarly suggested that the reviewed papers did not use the internationally adopted definitions of breastfeeding. Some

authors did not present a definition, while others used multiple definitions or even their own definitions. They also indicated that most studies did not find a correlation between ECC and breastfeeding or with its duration.<sup>44</sup> Overall, the relationship between breastfeeding and ECC is complex and confounded by many other biological and non-biological variables.

In summary, these findings suggest that the role of bottle and breastfeeding in caries development is not as clear as previously thought and further clarification of the association of infant feeding patterns and caries is required.

#### **1.3.2.2 Oral hygiene**

Studies exploring the association between toothbrushing habits and ECC have demonstrated that children who brushed their teeth less frequently were more likely to develop ECC.<sup>45, 46</sup> In addition to the frequency of toothbrushing, parental involvement in toothbrushing is another variable. A recent study describing the relationship between oral hygiene behaviour and the dental health of infants and toddlers reported that children who brushed their teeth themselves were more likely to have visible plaque compared with children whose teeth were cleaned by their parents.<sup>47</sup> The association between the age toothbrushing is started and ECC has also been examined. The findings collectively suggest that children who start to brush later in age are more likely at higher risk for ECC.<sup>35, 48</sup> However, toothbrushing alone does not seem to be as effective in reducing caries rates as toothbrushing with fluoride-containing toothpaste.<sup>49</sup>

#### **1.3.2.3 Demographic characteristics (SES, ethnicity)**

Although a clear definition has not been specified for the socioeconomic status of a child's family, most investigators have indicated that ECC is particularly prevalent in children

from low-income families.<sup>50, 51</sup> Socioeconomic status may influence caries risk in several ways. These families may have a lower perceived need for health care, resulting in less attention to preventive strategies and long delays in attending for treatment.<sup>52</sup> Family income level also may affect the ability to provide adequate nutrition. Furthermore, for these families, the financial cost of treating the disease is prohibitively expensive and does limit their access to dental care.<sup>53</sup>

Although a strong relationship between socioeconomic background and dental health has been clearly documented,<sup>30, 53</sup> because most studies include minority groups of lower income, it is difficult to separate the influence of ethnicity from the influence of low socioeconomic status on ECC.<sup>17</sup> Most studies of children from different cultural groups have demonstrated differences in the prevalence of ECC. Investigators in the United States, Canada, and Europe have demonstrated that in some ethnic minorities, prevalence of ECC is increased.<sup>10, 23, 54</sup> Native American and Canadian First Nations children also demonstrate an extremely high rates of ECC ranging from 70% to 90%.<sup>6</sup> Overall, evidence suggests increased risk of ECC in ethnic minorities that could be associated with cultural norms including prenatal diet, feeding practices, care of primary teeth, and access to dental and medical services.<sup>17</sup>

#### **1.3.2.4 Parenting style and family circumstances**

Parent's perceptions about dental health and their subsequent behaviours can either protect or place a child at risk to dental caries. Most investigators believe that parenting practices such as feeding and oral hygiene habits are central to the aetiology of ECC.<sup>6, 55</sup> Primary caregivers who were not confident about keeping their own teeth or perceived their own

teeth or their child's teeth as "bad" were more likely to have a child with ECC.<sup>10, 56</sup> Parenting behaviours also vary with culture and socioeconomic status.<sup>52</sup>

The relationship between parental behaviours and ECC may also be influenced by parental stress. A recent study exploring the relationship between parental stress and ECC concluded that higher rates of caries were found consistently among children whose parents experienced greater stress.<sup>57</sup> Parental stress measures might be representative of family circumstances such as socioeconomic status, education level, marital status, and number of children in the family.<sup>57</sup> Therefore, caregivers preoccupied with more immediate and pressing issues may be less likely to follow preventive oral health behaviours for themselves or their children.

#### **1.4 Prevention of early childhood caries**

Based on our knowledge of the aetiology of ECC, this disease can be prevented by a combination of community, individual, and professional strategies. While various interventions to prevent dental caries in young children are available, more than one strategy is probably needed to be successful. However, current methods of caries management that are limited to traditional preventive approaches like dietary counselling and application of fluoride in combination with restorative treatments have proven inadequate to control the disease. This inadequacy is likely because delivering these preventive services to the children with the highest risk for developing caries is often difficult.<sup>58</sup>

The mainstay of many community- and private practice-based programs has been education of caregivers with the hope that increased knowledge about the aetiology of ECC will persuade them to adopt healthy behaviours and to change existing unhealthy

behaviours. However, providing knowledge alone to parents has not been found to lead to long-term change in preventive behaviours.<sup>58, 59</sup> Thongchai *et al.* (2005) evaluated the process and the outcomes of a participatory dental health education (DHE) programme for preventing ECC in 520 mothers/caregivers of 6-19 month-old infants. The DHE model was demonstrated to be a practical and effective method for increasing oral hygiene practices, but was not sufficient to prevent the development of ECC.<sup>58</sup> However, this study was conducted in a rural area in Thailand and the generalizability of their findings to other contexts is questionable.

## **1.5 Rehabilitation of children with ECC**

### **1.5.1 General anaesthesia and ECC**

Extensive and comprehensive dental treatment is routinely required for children with ECC.<sup>60</sup> Because they often present behaviour management challenges, young children with ECC commonly receive oral rehabilitation under general anaesthesia (GA).<sup>2</sup> In fact, dental treatment is the most common surgical treatment for children in B.C. hospitals.<sup>61</sup> Each year, about 4,500 children are treated under GA in B.C. hospitals for dental disease; 60% of these children are under the age of four. Another estimated 3,300 children are treated in private surgical facilities.<sup>61</sup> Furthermore, the children who are most likely to suffer from poor dental health are from low-income families.<sup>62</sup> Only a minority of these families can afford the cost of treatment under GA, therefore, the cost of treatment is often born by publicly-funded insurance programs. The annual cost for this treatment has been estimated to be over \$10.5 million.<sup>61</sup>

Dental care under GA for preschool children has been reported to be well-accepted by parents and perceived to have a positive social impact on their child.<sup>63-65</sup> Parents

reported more smiling, improved school performance, and increased social interaction after the procedures.<sup>65</sup> Even though parents often express concern about the morbidity related to dental treatment under GA, the most common complaint reported by parents was post-operative pain as a result of the dental treatment itself.<sup>66, 67</sup> In a survey of 98 children who had dental treatment under GA, parents were asked whether they would like their child to be treated under GA again; 81% of the parents replied positively. No parent responded completely to the negative, but 18% of parents indicated that they would only choose this treatment modality again if no other solutions were available.<sup>68</sup> Therefore, the event of general anaesthetic surgery to complete a child's dental work does not appear to be as traumatic for either parent or child as might be expected.

### **1.5.2 Caries relapse**

Children with a history of ECC are highly susceptible to development of new caries, "caries relapse", even after comprehensive oral rehabilitation.<sup>34, 69-72</sup> Re-treatment rates have been reported as high as 50% at 6 month recall.<sup>72</sup> This staggering "relapse" rate supports the critical need for development of more acceptable and effective preventive interventions.

Many investigators have attempted to identify the factors associated with caries relapse after GA dental treatment.<sup>34, 69, 70, 73</sup> However, few have explored the effect of the GA dental treatment itself on modifying parental beliefs and changing their behaviours for their child's oral health.<sup>65, 74</sup> To identify those healthy children at risk for requiring repeated dental rehabilitation under GA, patient characteristics including age, dietary and hygiene habits, behaviour, initial dental condition, treatment variables, and parent's attitude were analysed in a recent study.<sup>69</sup> Factors associated with the event of a second

dental treatment under GA were determined to be: 1) "Child factors" including extensive caries of maxillary central incisors, bottle-feeding at the time of GA, and poor cooperation in dental appointments and 2) "Parent factors" including not brushing the child's teeth, dysfunctional social situation, and failure to return for follow-ups. As a result of these findings, the strategies recommended to improve the long-term dental health of high-risk children were aggressive treatment of existing caries at time of the GA, active postoperative follow-up, and education of caregivers.<sup>69</sup> In contrast, other investigators concluded that aggressive dental surgery for ECC did not result in decreased caries relapse.<sup>73, 75</sup> None of these investigators explored whether the GA dental treatment itself had any effect on modifying parental attitudes, changing their behaviours related to their child's oral health, and, as a result, diminishing their child's risk of relapse.

### **1.5.3 Parental behaviours and caries relapse**

Parents' beliefs about dental health and prevention of disease either protect a child from, or place a child at risk to caries relapse.<sup>69, 76</sup> The less than ideal preventive dental home care practices of many parents following their child's GA are a discouragement to practitioners, but warrant a better understanding.<sup>72, 77</sup> Berkowitz *et al.* (1997) reported a 71% failure rate for keeping scheduled follow-up visits for children treated for ECC with GA. Among those few children who presented for follow-up evaluations, 54% had new carious lesions. A positive relationship between the failure in attendance for an immediate follow-up appointment and the likelihood of experiencing caries relapse was also found in another recent study.<sup>75</sup> Of 193 children who received GA for treatment of ECC only 39% had returned for their scheduled 2-week follow-up appointment. However, about 90% had attended at least one of the scheduled 6 monthly recall appointments for examination,



cleaning, and counselling and about 53% had developed new caries within 6 to 24 months following the GA. While the relapse rate was higher in children who failed the immediate follow-up appointment than in those who had attended this appointment, the difference was not statistically significant.<sup>75</sup>

Caries relapse after the GA has been demonstrated to be associated with unfavourable eating patterns, unsupervised daily toothbrushing, and limited exposure to fluoride.<sup>77</sup> From these results it appears that while parents whose children have had GA treatment value the short-term benefits of the surgery for what they see as an “acute” problem, they are unable or unwilling to control this “chronic” disorder over time.

Parents’ beliefs and attitudes towards dental health influence the way they practice oral health for their child.<sup>78</sup> Parental beliefs and attitudes about their child’s oral health were recently explored in an ethnographic study to better understand children’s oral health in a multicultural community.<sup>79</sup> Parents attributed their past negative experience as primary motivators for their attitudes toward dental care. They indicated that they did not like to see cavities in their child’s teeth, but many of them did not feel that the decayed teeth should be repaired. In addition they believed that the first dental visit should occur no earlier than 2 years of age. As the result, regular dental care was not common for these groups of parents and preventive dental visits for children prior to school age were unusual.<sup>79</sup>

In contrast to the ethnographic research of Riedy *et al* (2001), most analyses of parental oral health beliefs and behaviours have been quantitative studies<sup>76, 78, 80</sup> which provide limited opportunity to explore beliefs, attitudes, and behaviours.<sup>81</sup> For example, in an international study conducted in 18 countries, an explanatory model was developed to

explain factors related to the development of early childhood caries. Initially the main biological and non-biological risk factors were identified from the literature. Two parental behaviours were also identified as key to caries development: sugar snacking and toothbrushing with a fluoride tooth paste. Parents' beliefs and attitudes associated with these two behaviours were developed from the Theory of Planned Behaviour, the Health Belief Model, and the Health Locus of Control in a questionnaire format. Parents were asked to rate how strongly they "agreed" or "disagreed" with questionnaire items. This study, similar to any other quantitative study, mostly used a deductive process of theory development. The researchers started with preconceived ideas and hypotheses and found the relationship between the variables that they hypothesized had a relationship. They tested their hypotheses while disregarding the context within which the hypotheses operated. As a result, some concepts were likely overlooked or simply never recognized. The opportunity to acknowledge and respect parent's concepts and concerns was missed. In order to be able to develop more effective and acceptable interventions we must listen to parents, and a qualitative approach may afford us this opportunity.

An exploratory qualitative approach can help us understand the concepts that may never arise in a quantitative study. These concepts, in turn, can improve our understanding of strategies to facilitate change in parental behaviours and can provide insights into the motivators and the barriers to behaviour change, as reported by parents. Qualitative research methods are based on a holistic philosophy and explore issues within a context. The descriptive information revealed by qualitative inquiry may help us to better resolve parents' ambivalence about changing their behaviours related to their child's oral health.

## **CHAPTER II**

### **CONCEPTUAL FRAMEWORK**

## **2.1 Introduction**

Health behaviour, similar to any other type of behaviour, is a product of specific contexts. These contexts include specific thoughts and attitudes about behaviour and the particular circumstances associated with a decision to adopt a particular health behaviour. The identification of the factors affecting health behaviour is imperative to not only enhance our understanding of health behaviour, but also our understanding of change in health behaviour and health promotion. In this chapter, I will first briefly introduce some of the social cognitive factors such as cognition, personal beliefs, and attitude that have been highlighted as the determinants of behaviour in general and health behaviour in particular. Then, I will present an analysis of some relevant theories that have been developed to help us understand health behaviour and health behaviour change.

## **2.2 Basic drives and motivators of behaviour**

Each individual is surrounded by multiple sets of inter-correlating factors that influence behaviour. Some factors are within the individual; others are related to the socioeconomic and environmental conditions in which individuals live. Theories of psychology describe two kinds of motivation for human actions. Extrinsic motivation results from external stimuli and intrinsic motivation from the individual himself. Behaviour is therefore determined by an interaction between beliefs, expectations, and needs on the one hand and the environment on the other hand.<sup>82</sup> Except for elementary reflexes, i.e. instinctual behaviours, people are not equipped with inborn behaviours. Behaviour must be learned. Patterns of behaviour can be acquired either by direct experience or by observation. Biological factors also play a role in the acquisition process. For instance, genetics affect physical development, which in turn can influence behavioural potential.

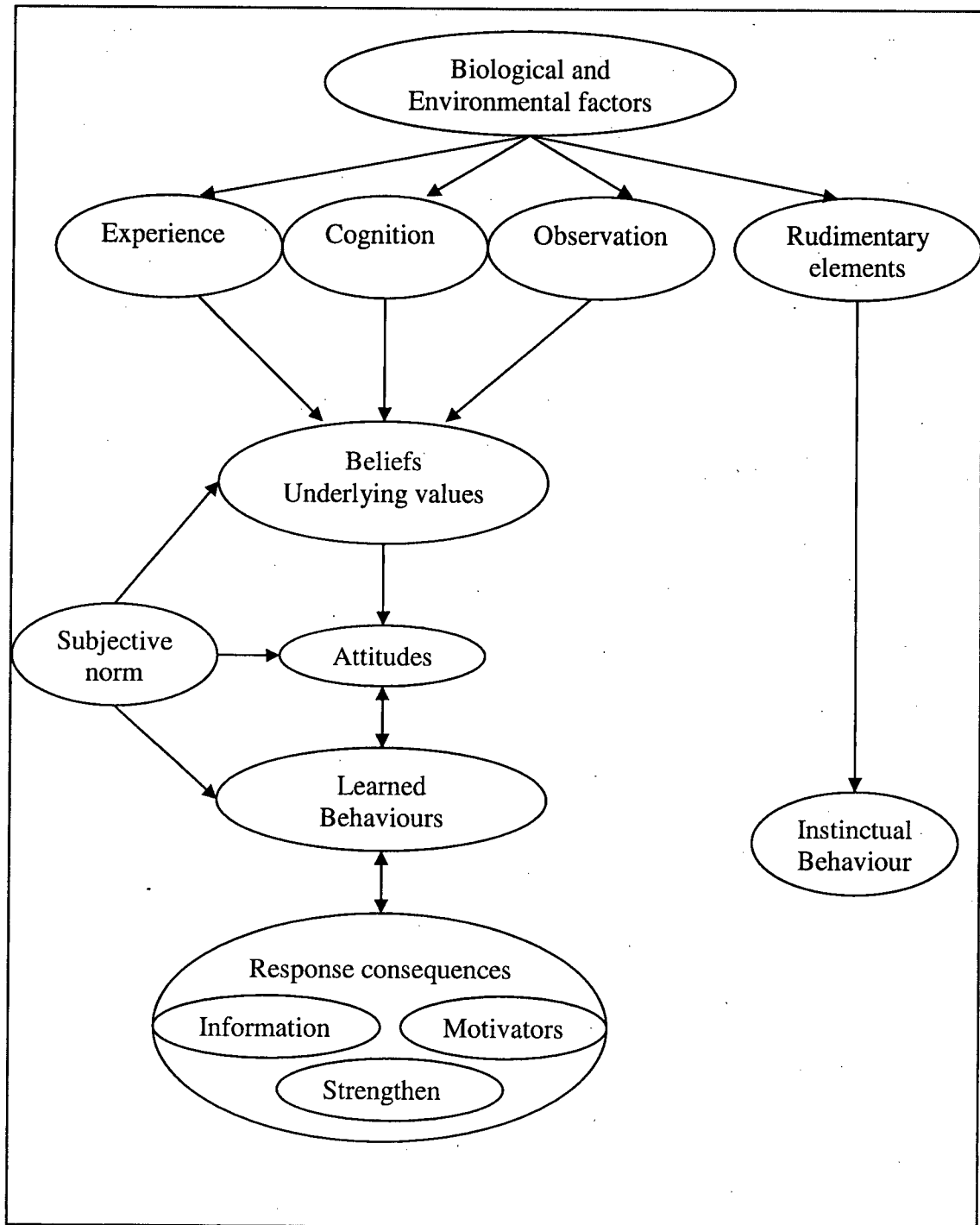
In addition, our actions are shaped automatically and unconsciously by their immediate consequences or "response consequences."<sup>83</sup> Response consequences have several functions. First, they impart information. Second, they serve as motivators because of their incentive value. The third function concerns their capacity to reinforce responses automatically.<sup>84</sup> Nonetheless, most external influences affect behaviour through intermediary cognitive processes. I have summarised the factors that influence human behaviours and their relationship in **Figure 2.1**.

### **2.2.1. Cognition**

Cognition refers to the mental processes of an individual with particular relation to internal mental states such as beliefs, desires and intentions. Cognitive factors partly determine which external events will be observed, how they will be perceived, whether they leave any lasting effects, what efficacy they have, and how the information they convey will be organized for future use. By employing the information that is derived from experience, one can comprehend events and generate new knowledge about them.<sup>83</sup>

Theories of behaviour can be divided into two categories, cognitive theories and non-cognitive theories. Cognitive theories are based on the idea that our conscious thoughts play the major role in our motivation. If we understand people's thoughts and beliefs then their behaviour can be predicted. Non-cognitive theories state that behaviour is a function of its consequences and is seen to be caused by environmental incidents.

**Figure 2.1** Overview of the factors that affect human behaviours



In other words, behaviour that is found to be pleasurable will be repeated and if the consequence hurts the person, physically or emotionally, the behaviour will not be repeated.<sup>85</sup> Non-cognitive theories are inadequate to explain human behaviour because they are not able to explain “what goes on in a person’s head”. Instead, they claim that it is the environment that determines the behaviour of a person. Therefore, to control behaviour, one must control the person’s environment.

### **2.2.2 Personal beliefs**

Belief is a state of mind in which trust or confidence is placed in something. Human behaviour is partly governed by personal beliefs, which include value preferences and self-evaluating standards.<sup>84</sup> Through personal beliefs, people give direction to their lives and derive satisfaction from what they do. Personal identity and security become heavily invested in a belief system; therefore, a belief system cannot be easily discarded once acquired. However, belief systems vary in their mutability, ranging from strict prescriptions to be accepted unquestionably to temporary notions that invite change through experience and critical analysis.<sup>86</sup> While beliefs provide direction and meaning to experience, they may distort it as well.

Why do people sometimes act on their beliefs but at other times are reluctant to do so? As Kiesler<sup>87</sup> has explained there are three main reasons why one might wish to act on one’s beliefs. First, the person has a positive self-image, thus he feels that his attitude is correct; the issue is valid, so something should be done. Second, acting on one’s beliefs enhances one’s self-view and gives one a feeling of personal integrity and courage. And third, acting on a belief implies knowledge of the issues involved. It means the “actor” is knowledgeable and knows what he is doing.<sup>87</sup>

However, there are other things that people may consider when they want to follow their beliefs. Acting on one's beliefs requires a reasonable certainty that one is correct. In a complex world, it is very difficult to verify one's beliefs. Many attitudes are not well thought out and may be a holdover from childhood. Therefore, it may occur to the "actor" that he could be wrong and he will appear silly both to himself and to others. In addition, there is always the possibility that behaviour costs the actor some effort, time, and money. As a result, the actor may have second thoughts about his action. Some people may also be afraid of other people's reaction to their behaviour and their behaviour may affect their relationships with others in a different way. Therefore, our social behaviour may remain silent in its effect. It had been found that people who expected their opinions to be made public were more reluctant to accept a persuasive communication than were those who did not think that their opinions would be observed by others.<sup>87</sup>

### **2.2.3 Attitude**

Attitude has been defined as:

"... certain regularities of an individual's feelings, thoughts and predispositions to act toward some aspect of his environment".<sup>88</sup>

Therefore, an attitude has three components: the affective component (feelings), the cognitive component (thoughts), and the behavioural component (predispositions to act). These components are presumed to be consistent within each individual and each attitude.<sup>87</sup> Although attitude guides behaviour and leads a person to act one way and not another, not all behaviour is guided by attitude.

Many factors affect the relationship between attitude and behaviour that determines whether a person acts on his attitude in a given situation at a particular time.



The first is “extra-attitudinal pressures” such as a social norm or incentive. For example, a person will be more likely to behave as we wish if we offer him a prize for doing so. Because of the environmental pressure or subjective norm, person A may act on his beliefs and person B may not, even though the prior beliefs and attitudes for two individuals, for all intents and purposes, may be identical. We may also have “conflicting attitudes” that affect behaviour. One cluster of our attitudes impels us to do something and a different set render us reluctant. Our final behaviour may be determined by the relative intensity of these two groups of attitudes. Finally, the difficulty of a behaviour may also change the likelihood of performing that behaviour.

## **2.3 Understanding health behaviour**

### **2.3.1 Definition of health**

Various definitions of health have been considered in the field of health care. These definitions are usually placed in three areas. The first is the perception of health in terms of whether it extends beyond the physical domain. The second includes the means of improving and maintaining health. The third considers the value and aim of health. These three areas are usually considered together in both historical and contemporary definitions.

In ancient times, health was considered a beneficial advantage that required action by the individual to be preserved. During classical times and the middle ages, the struggle to survive through serious crisis such as common epidemics and childhood infections limited people's abilities to improve their physical health. Under such conditions, strong emphasis was given to mental, social and spiritual dimensions of health. By the end of the eighteenth century, public health and medical advances had established the basis for people

to believe that a long life could be obtained through community actions as well as through the actions of individuals. At the turn of nineteenth century, it was expected that all the challenges to health and disease would be conquered in a short period of time. Midway through the twentieth century and with the advent of the use of antibiotics and vaccines, this belief endured and remained in some ways an obstacle to the full realization of a broader definition of health.<sup>89</sup>

Prior to the Second World War, Sigerist, a well known public health professional, expressed the view that:<sup>90</sup>

".... health is, therefore, not simply the absence of disease; it is something positive, a joyful attitude to life, and a cheerful acceptance of the responsibilities that life puts upon the individual... A healthy individual is a man who is well balanced bodily and mentally, and well adjusted to his physical and social environment."

Development of the notion of social responsibility for health and the duty of individuals for the care of their health was espoused by Dr Andrija Stampar, who was to become President of the First World Health Assembly of WHO. In 1947, the founders of the WHO defined health as:<sup>91</sup>

"... a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity". The Constitution further recognized "the enjoyment of the highest attainable standard of health ... as one of the fundamental rights of every human being."

Over the decades, there have been many criticisms of the WHO definition of health. Some health professionals consider the definition to be too inclusive. They feel the definition should focus on the physical domain of health; the rationale being that health and its achievement are best left to health professionals and to the application of specific health

and medical interventions. There are other health professionals who feel the definition excludes important dimensions, such as the spiritual and ethical dimensions of health. Another concern is that it is an idealistic definition and only a few people can be regarded as truly healthy. Additional difficulties are related to the problem of measuring health and of implementing programs that will improve the health of individuals and populations. WHO has attempted to resolve some of these measurement issues by identifying specific targets and indicators<sup>92</sup> that are only alternatives of certain dimensions of health. Furthermore, by defining health in terms of one's ability to work productively and participate fully in social life, a greater degree of health is achievable.

### **2.3.2 Health behaviour models**

Concurrent to establishing the new definition of health by WHO, a new paradigm for understanding health and treating illness was developed. The focus of this paradigm shifted from "fighting sickness" to "building health" and well-being.<sup>93</sup> A number of health care models<sup>1</sup> were developed based on this paradigm. In these models, more emphasis has been put on behavioural factors rather than environmental factors. The belief that the causes, development, and outcome of an illness are determined by the interaction of psychological, social, and cultural factors with biochemistry and physiology is also emphasized.<sup>93</sup>

The study of health behaviour is based on two assumptions; first, a substantial proportion of illnesses occurs because of particular behaviour patterns and second, these behaviour patterns are modifiable.<sup>94</sup> It is increasingly recognized that individuals can make major contributions to their own health and well-being through the adoption of

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<sup>1</sup> Health care models are theoretical models for health care practitioners to enable better delivery of health care.

particular health-enhancing behaviours and the avoidance of health-threatening behaviours.

The identification of the factors predicting health behaviour has become a major focus of research in many health disciplines. This research has been motivated by two main factors: first, a desire to design interventions to facilitate change in health behaviour and, therefore, produce improvements in individuals' and populations' health; second, a desire to gain more understanding of the reasons why individuals perform a variety of behaviours.<sup>94</sup> For many years, social psychological models have been at the forefront of research to predict and explain health behaviours. However, social psychologists have struggled to demonstrate the link between attitude and behaviour that tradition suggests must exist. Therefore, they turned to new concepts and models for a solution, social cognition models. "Social cognition" became a distinctive and accepted term and, by the mid 1990s, the role of social cognitive models in the understanding and prediction of health behaviour was well-established in the literature.<sup>95</sup> Two broad types of social cognitive models have been developed and extensively applied to the understanding of health behaviours. The first type has been labeled "attribution models". These are concerned with individuals' causal explanations of health related events. However, most research within this category has focused on how people respond to a range of serious illnesses rather than the health-enhancing or health-threatening behaviours of otherwise healthy individuals.<sup>95</sup>

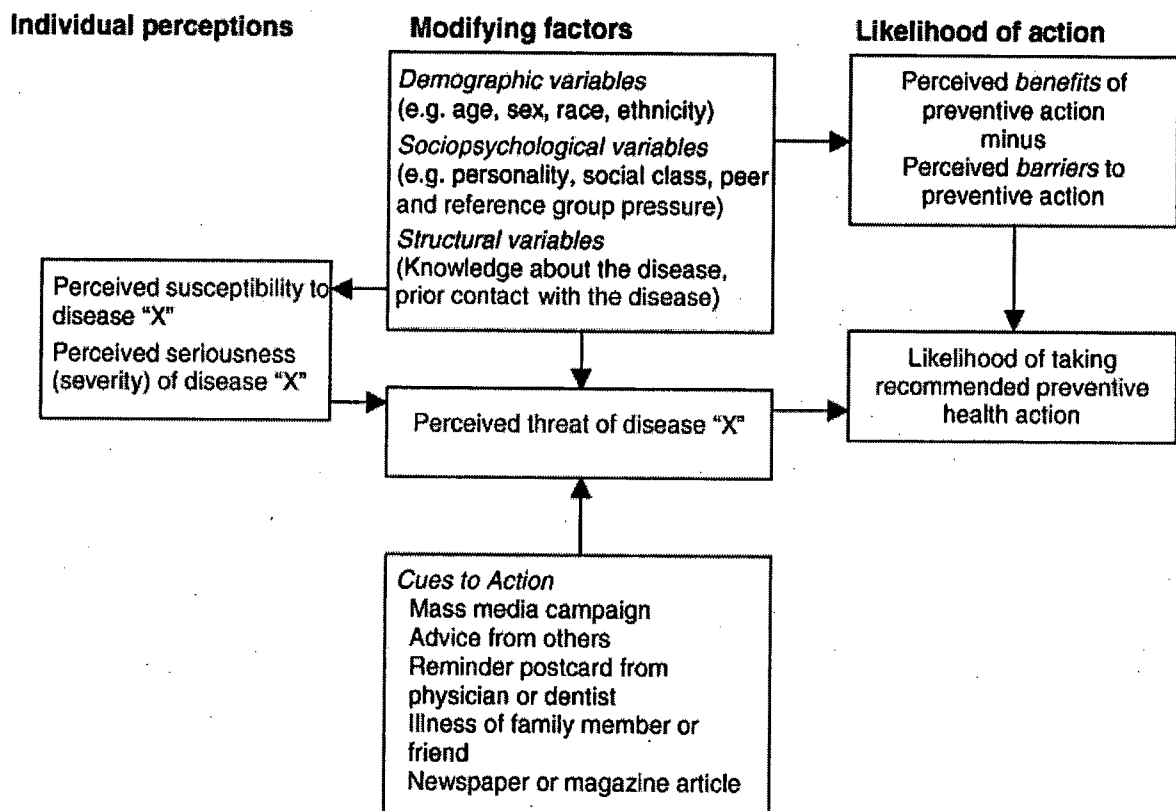
The second type of social cognitive models examines various aspects of an individual's cognitions, i.e. mental processes, in order to predict future health-related behaviours and outcomes. The most commonly used models in this group, which are also

applicable to the present study, are the health belief model, health locus of control, self-efficacy theory, theory of reasoned action/theory of planned behaviour, and transtheoretical model. These models provide a basis for understanding the determinants of health behaviour and health behaviour change.

#### **2.3.2.1 Health belief model**

The health belief model (HBM) is perhaps one of the most widely used social cognition models in health psychology. It originated in the 1950s to explain why people would not participate in programs to prevent or detect disease; however, it was eventually expanded to address existing health problems and therapeutic interventions.<sup>96, 97</sup> The significant constructs in the HBM originally documented by Rosenstock (1974a) include: 1) perceived susceptibility, the belief that one is susceptible to a serious health problem; 2) perceived severity, associated with feelings about the seriousness of acquiring an illness in terms of medical and social consequences; 3) perceived benefits, the belief that following the particular health recommendation would be beneficial in reducing the perceived threat; and 4) perceived barriers, the cost-benefit analysis undertaken to weigh up a beneficial action. "Cost" includes dollars, side effects, time, and inconvenience. In a later version of the model, additional variables such as health motivation and "cues to action" were also acknowledged.<sup>98</sup> Finally, Rosenstock addressed "modifying variables", defined as demographics, socio-psychological and structural factors, as being those variables which serve to condition an individual's perceptions about perceived benefits of preventive health actions (Figure 2.2).

**Figure 2.2** The original health belief model, from Rosenstock, 1974



When compared to other social cognitive models of health behaviour, the HBM suffers from a number of weaknesses. Several social cognitive variables found to be highly predictive of behaviour in other models are not incorporated into the HBM. For instance, intentions to perform a behaviour and social pressure are key components of the theory of reasoned action/planned behaviour,<sup>99</sup> which do not appear in the HBM. Perception of control over the performance of the behaviour, i.e. self-efficacy, which is a powerful predictor of behaviour in self-efficacy theory<sup>84</sup> is not clearly included in the HBM. In addition, the lack of a causal ordering among the variables in the HBM, present in other models, precludes a more powerful analysis of data and clearer indications of how interventions may have their effect. Finally, the model is static; no distinction is made between a motivational stage dominated by cognitive variables and a volitional phase where action is planned, performed, and maintained.<sup>100</sup>

It is possible to apply the HBM to an oral health condition such as early childhood caries. If parents believe that their child is susceptible to dental caries, that primary teeth are important, that dental caries is a serious threat to their child, and that dental caries can be prevented, then they should be willing to limit their child's exposure to sweets and assist the child in practicing appropriate oral hygiene. The underlying principles of the HBM predict that parents with better information will make better health decisions about their child's oral health. However, the HBM has not proven useful in predicting the preventive dental health behaviour of children in terms of dental visits,<sup>101</sup> participation in a preventive program,<sup>102</sup> or adherence to at-home mouth rinsing.<sup>103, 104</sup> The cumulative conclusion of these investigators was that the model was relevant and the variables of the model were necessary but not sufficient to explain health behaviour. For example, the

variable of “past behaviour,” which is an excellent predictor for future dental behaviour, is not included in the HBM.<sup>103</sup>

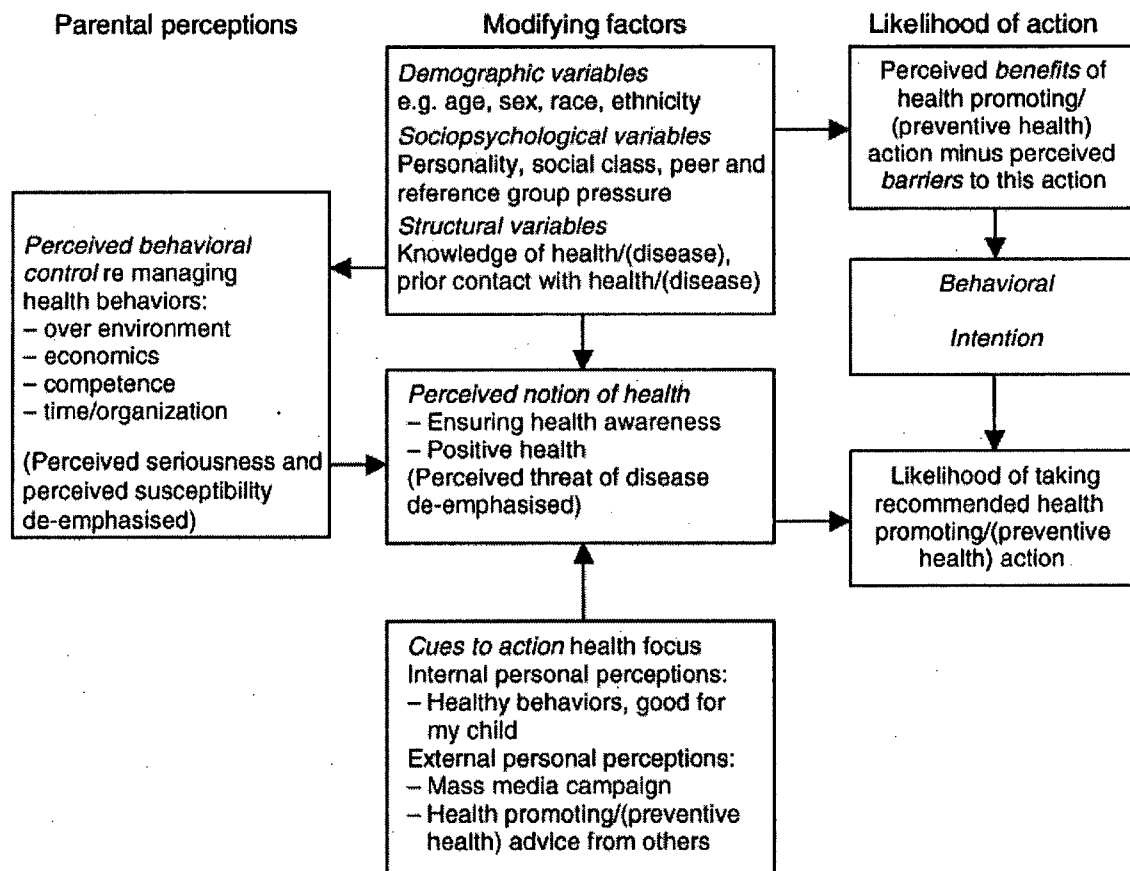
Recently, Roden (2004) proposed a new version of HBM to apply to families with young children and their health promotion needs in order to identify “at risk” families. Identifying “at risk” families is crucial in developing a health promotion strategy. Roden reoriented the focus of the model from “disease prevention” to “health promotion,” which she considered more appropriate for young families. In addition, the two constructs of “perceived behavioural control”<sup>1</sup> (presenting health locus of control) and “behavioural intention” were added to the new model to assist in tackling some of the criticisms such as lack of accuracy and limited logical clarity (**Figure 2.3**).<sup>105, 106</sup>

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<sup>1</sup> Perceived behavioural control is a way of acknowledging how much control people perceive they have over maintaining their level of wellness.



**Figure 2.3** Revised Health Belief Model for young children (Roden, 2004)



Although the new version of the HBM is more applicable to young families than the original model, both revised and original models mostly rely on the fact that “supplying information can change health behaviour”; while behaviour change rarely follows a logical, stepwise progression. Cross-sectional studies have found strong association between the HBM stages and oral health.<sup>107, 108</sup> However, longitudinal studies have not shown good predictive value in following HBM principles.<sup>102</sup> Perhaps, adopting a behaviour indicates that the individual believes the condition is serious and the interventions have value; however, measuring those beliefs before behavioural changes take place has questionable value. Therefore, an exploratory research approach is necessary to explore the various components of “behaviour change” as well as the “likelihood of action”.

#### **2.3.2.2 Health locus of control**

The construct of health locus of control (HLC) was derived from social learning theory.<sup>109</sup> The theory measures to what extent people believe that their health is influenced either by their own behaviour or by external causes. A later version of this theory developed by Wallston et al. (1978) used a multidimensional HLC scale, which measures expectancy belief<sup>1</sup> with respect to health along three dimensions: internal control, external control (powerful others control), and chance control. The main prediction from HLC theory is that “internals”, who believe their health is under the influence of their own actions, should be more likely to engage in health-promoting practices.<sup>110</sup>

Studies linking parental internal HLC beliefs to the performance of preventive health activities for their child have produced conflicting results. For example, while little

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<sup>1</sup> Expectancy belief is a generalized expectancy for controlling beliefs

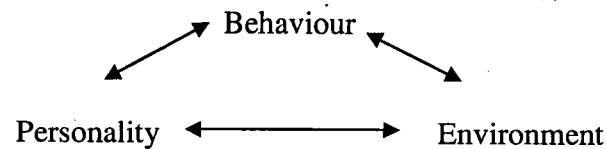
association was found between a mother's HLC belief, children's health status, and use of preventive health services,<sup>111</sup> mothers' HLC belief has been shown to be predictive of children's dental health.<sup>112</sup> Researchers found children whose mothers had more external HLC beliefs were at higher risk of developing dental caries.<sup>112</sup> In a recent study, the relationship between clinical outcomes for children treated for ECC under GA and parental HLC beliefs was assessed.<sup>71</sup> While no meaningful difference was found between the "relapse" versus "non-relapse" groups with respect to each HLC parameter (professional, parent, child, media, fate, divine), parents who returned for follow-up care demonstrated internal HLC beliefs and those who did not return had external HLC beliefs.

HLC enables the prediction of health behaviour only when people value their own health. No relationship is expected for individuals who place "no value" on their health. In short, health behaviour is complex and has multiple determinants and, as a result, HLC theory is too narrow to explain health behaviour adequately.<sup>95</sup>

### **2.3.2.3 Self-efficacy theory**

This theory has evolved from Bandura's social cognitive theory (1977). Social cognitive theory, a revision of social learning theory, states that individuals do not learn or change behaviour in a linear way. Rather, their functioning is explained in terms of a model of "triadic reciprocity" in which behaviour, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other (**Figure 2.4**).<sup>83</sup>

**Figure 2.4** The relations between the three classes of determinants in triadic reciprocal causation (Bandura 1986)



In self-efficacy theory, human motivation and action are based on three types of expectancies: situation-outcome, action-outcome, and perceived self-efficacy. Situation-outcome expectancies represent beliefs about what will happen without interfering with personal action. Susceptibility to a health threat is an example of this expectancy. Action-outcome expectancy is a belief that a given behaviour will or will not lead to a given outcome. Self-efficacy expectancy is a belief that behaviour is or is not within one's control.

The concept of self-efficacy contains ideas similar to HLC. However, while self-efficacy focuses on beliefs about one's personal abilities in a specific setting, HLC is a generalized perception of who or what is in control of one's health. Studies comparing the predictive power of these two theories have demonstrated self-efficacy to be more related to health behaviour than locus of control. Thus, self-efficacy theory has recently become more prominent in health promotion research.<sup>113</sup>

Self-efficacy has been demonstrated to be an accurate predictor of oral health.<sup>114-</sup>  
<sup>116</sup> A qualitative analysis of dental attitudes of a group of adults indicated that low dental self-efficacy was associated with poor oral hygiene.<sup>116</sup> The four cognitive, experiential, supportive, and emotional dimensions, as well as childhood experiences were identified as

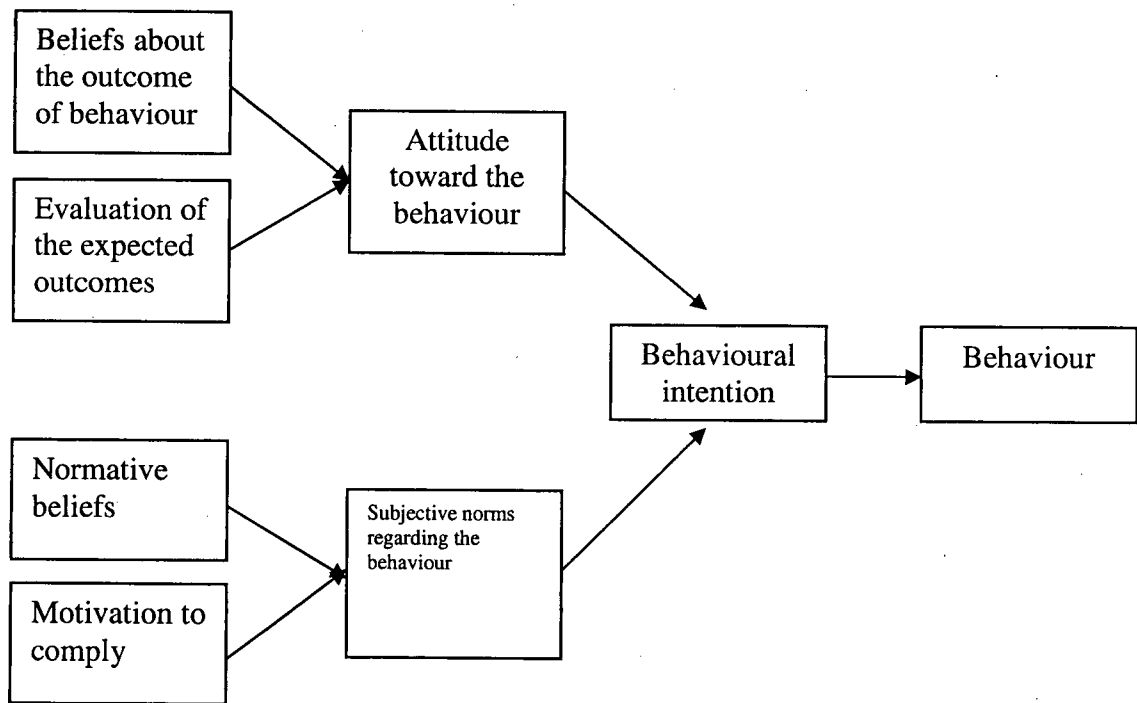
the sources of dental self-efficacy.<sup>116</sup> A perception of dental self-efficacy was also found to be an important determinant in compliance with dental recommendations and in the oral health behaviour of diabetic patients.<sup>114</sup>

In an attempt to create a model of caries development in a sample of children of low socioeconomic status, *S. mutans* levels and dental health behaviours were found to be the main determinants of early caries development. The behaviours themselves were found to be influenced by parental cognitive factors such as self-efficacy or controllability.<sup>115</sup> Parents' perceptions of self-efficacy or judgment about the ability to perform certain behaviours like brushing a child's teeth were an important basis for action. Parents with a strong sense of efficacy tend to set higher goals, persist longer at tasks despite difficulties, and devote more effort and energy to the act compared to those without a strong sense of efficacy.<sup>117</sup> Thus, parental self-efficacy may be a useful part of a multidimensional model to predict ECC and should be considered in any planned interventions.

#### **2.3.2.4 Theory of reasoned action/ theory of planned behaviour (TRA/TPB)**

This theory provides a framework to study our attitudes toward behaviour.<sup>99</sup> According to the theory, the most important determinant of a person's behaviour is the person's intention to perform the behaviour. The individual's intention to perform a behaviour is a combination of attitude towards performing the behaviour and subjective norm or perceived social pressure to perform (or not perform) the behaviour. Attitude is a product of a set of salient beliefs about the consequences of performing the behaviour. Subjective norm is determined by the person's normative beliefs about perceived social pressure from significant others (**Figure 2. 5**).

**Figure 2.5** Theory of reasoned action; Ajzen & Fishbein, 1980



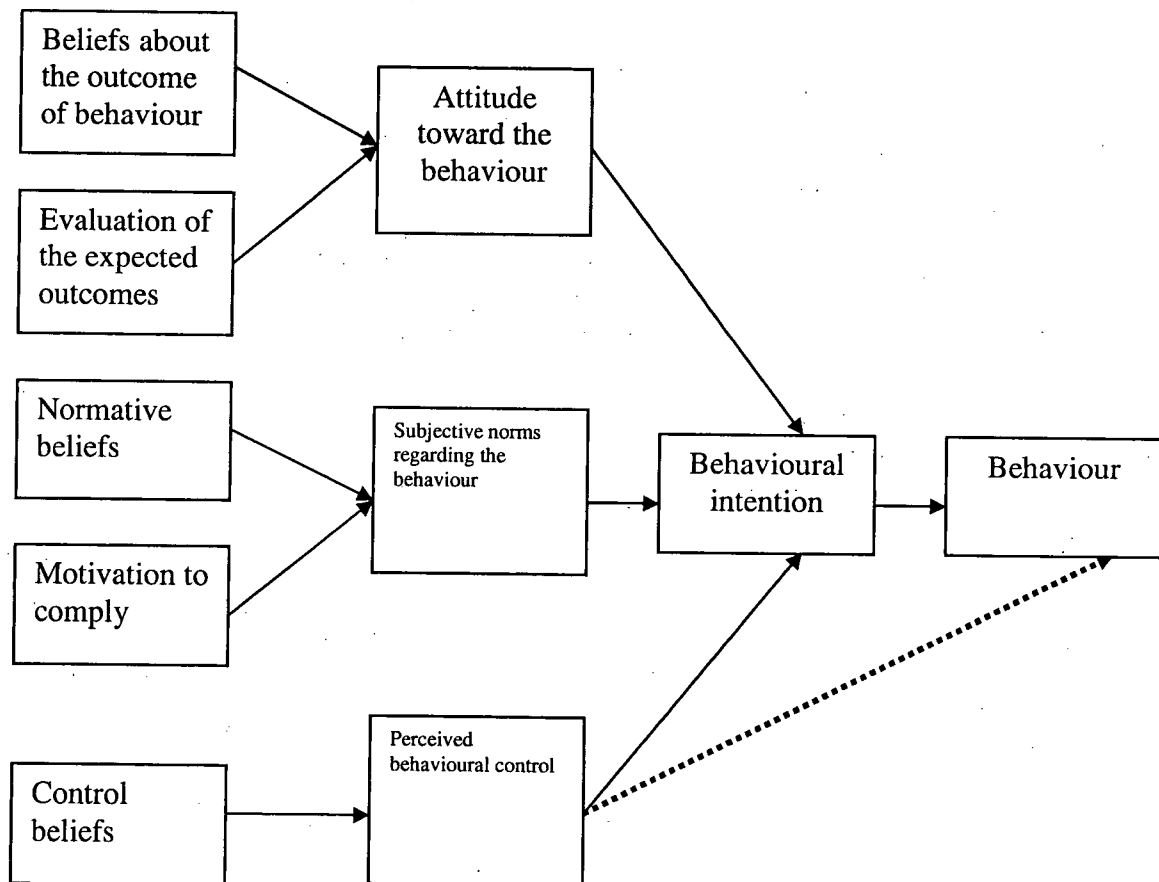
If people perceive that the outcome from performing a behaviour is positive, they will have a positive attitude toward performing that behaviour. If relevant others see performing the behaviour as positive and the individual is motivated to meet the expectations of relevant others, then a positive subjective norm is expected. The opposite can also be stated.

The TRA works most successfully and provides adequate predictions when applied to behaviours that are under a person's "volitional control"<sup>1</sup>. If behaviours are not fully under volitional control, even though a person may be highly motivated by her/his own attitudes and subjective norm, she/he may not actually perform the behaviour due to intervening environmental conditions. To overcome this limitation, Ajzen modified the TRA by adding a third antecedent of intention called "perceived behavioural control". Perceived behavioural control is the individual's perception of the extent to which performance of a behaviour is easy or difficult. In other words, we are more likely to engage in behaviours that we believe we can control. With the addition of this third predictor of intentions, Ajzen re-named his theory the "theory of planned behaviour" or TPB. (Figure 2.6)

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<sup>1</sup> Behaviours that are readily controlled by person's conscious attention (such as speech) although that volitional quotient would vary within the same person over time, and differ across behaviours for the same person, and across people for the same behaviour.

**Figure 2.6** Theory of Planned Behaviour; Ajzen, 1985





The TRA/TPB has been applied to the prediction of a number of different behaviours, including health-relevant behaviour, with varying degrees of success. The findings of a number of studies that used TRA/TPB have been generally supportive.<sup>118, 119</sup> The TRA has been tested in relation to oral health.<sup>120, 121</sup> In a study of diabetic adults, variables such as the intention to brush the teeth and attitude and subjective norms related to oral health behaviour were analysed to explain the reported frequency of toothbrushing, dental caries, and adherence to diabetes control.<sup>120</sup> Results suggested that when attempting to promote better oral health in a sample of diabetic patients, both subjective norms and attitudes are important and diabetes self-care may be influenced by enhancing patients' attitudes toward their oral health. In another study, the TRA was used as the conceptual framework to examine the effect of attitudes and subjective norms on intention to provide oral care for patients receiving chemotherapy. Both attitudes and subjective norms were found as significant predictors of behavioural intention.<sup>121</sup>

The predictive utility of the TPB has also been proven in regard to oral health behaviours. In a study involving adolescents, attitudes and perceived behavioural control predicted intended sugar consumption. The investigators suggested that interventions should target the beliefs underpinning attitudes and perceived behavioural control in order to decrease adolescents' motivation for frequent daily consumption of commercialized sugar products.<sup>122</sup> Nonetheless, because the TRA/TPB models were developed outside the health field, they do not consider the assessment of health threat as being an influencing as do models such as the HBM.<sup>95</sup>

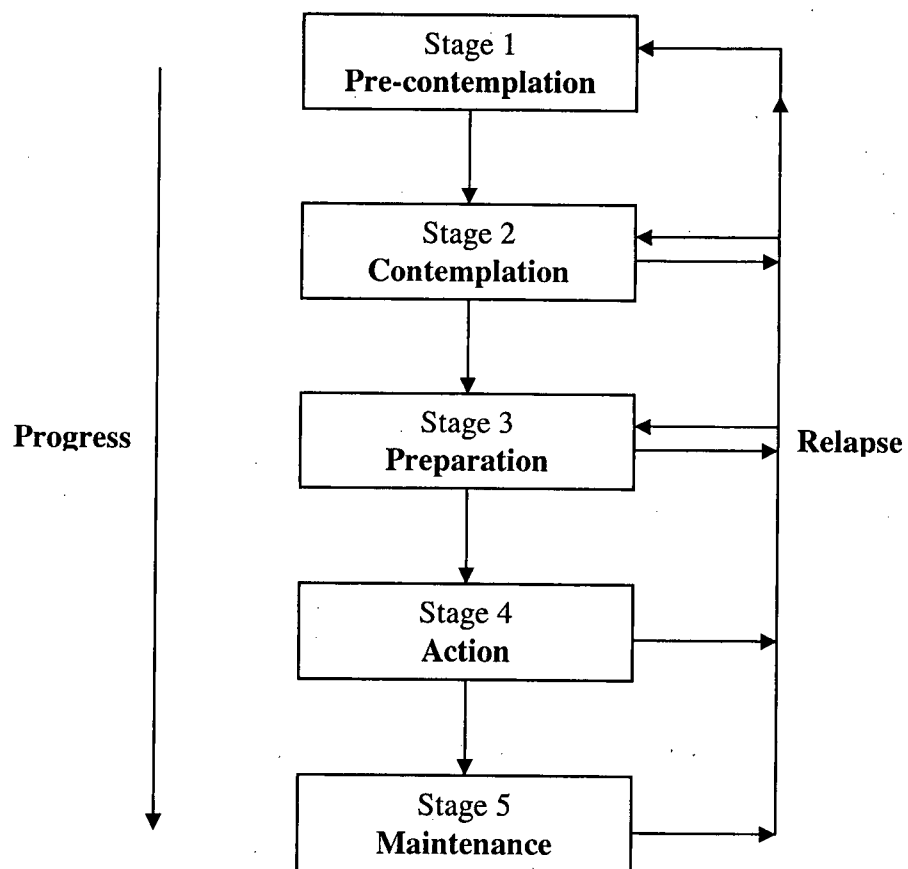
### **2.3.2.5 Transtheoretical model/stages of change model**

The Transtheoretical model (TTM) of behaviour change was developed to explain how people make successful and lasting positive change in their lives and how their efforts can be best assisted along the way.<sup>123-126</sup> The Framework of TTM contains four components: the stages of change, processes of change, decisional balance, and self efficacy (**Table 2.1**). The central organizing construct of the model is the “stages of change” (**Figure 2.7**). These stages are 1) Pre-contemplation: the stage where people are not intending to take action in the foreseeable future, usually measured as the next six months. People may be in this stage because they are unaware about the consequences of their behaviour or they may have tried to change a number of times and became discouraged about their ability to change. 2) Contemplation: the stage where people are intending to change in the next six months. They are more aware of the “pros” of changing but are also highly aware of the “cons”. This balance between the costs and benefits of changing can produce profound ambivalence that can keep people “stuck” in this stage for long periods of time. These people are also not ready for traditional “action-oriented” programs. 3) Preparation: the stage where people are intending to take action in the immediate future, usually measured as the next month. They have typically taken some significant action in the past year. These individuals have a plan of action. 4) Action: the stage where people have made specific obvious modifications in their life-styles within the past six months. 5) Maintenance: the stage where people are working to prevent relapse. They do not apply change processes as frequently as do people in action. They are less tempted to relapse and increasingly more confident that they can continue their change.

**Table 2.1** The Transtheoretical model components adapted from Prochaska *et al.* (2002)

<b>Model Components</b>	<b>Description</b>
Stages of change	The five sequential stages involved in any behaviour change
Processes of change	Strategies and techniques that support the change process
Decisional Balance	The balance between perceived advantages and disadvantages of behavioural change
Self-efficacy	Self-confidence in ability to perform and maintain new behaviour in the face of temptations

**Figure 2.7** The stages of change model adapted from Prochaska *et al.* (2002)



It is further suggested that different type of cognitions are important in each of these phases. For instance, in the earlier stages, cognition about the desirability and feasibility of the behaviour are believed to be important determinants, while in the later stages the individual focuses on the development of plans of action to initiate and support the maintenance of a behaviour.

This theory has also been subject to criticism. One concern is that the concept of "stage" refers to consecutive motivational and behavioural levels through which both forward and backward transition are possible.<sup>127</sup> Another criticism concerns the utilisation of a model to measure stages that may be useful for one behaviour, e. g. smoking, but less applicable to other behaviours. For instance, researchers have demonstrated that the classic utilization of the model may result in significant misclassifications by placing subjects in maintenance because they think that they have changed their behaviour, while in-depth analysis showed that they did not perform the recommended behaviour and thus should have been labelled as pre-contemplators.<sup>128</sup> In addition to being cautious about the application of the stage model, a detailed analysis of the cognitive variables that are important in encouraging movement along the various stages is required to provide a complete list of determinants of health behaviour. Nonetheless, the concept of stages or motivational phases has caused an important shift in health psychology by indicating that behaviour change is not a dichotomy but a process.

The Transtheoretical Model has been applied to both the adoption of health behaviours such as weight loss and exercise,<sup>129, 130</sup> and cessation of unhealthy behaviours, such as smoking.<sup>131</sup> The application of TTM has also been tested in a program to improve

oral hygiene. A “stages of change” instrument and a “decisional balance” instrument were developed and found to be reliable and valid in order to change oral self-care behaviour.<sup>132</sup>

Similarly, most parents of children with early childhood caries do not go to a dental professional in a state of readiness to change their unhealthy behaviours related to their child’s oral health. They may not see their behaviour as a problem and thus have no intention of changing. Even if they are aware that a problem exists, they may be ambivalent and are considering action but are not yet committed to the action. The “Stages of Change” perspective of TTM along with “Motivational Interviewing” (MI) has been applied to mothers of children at high risk of developing ECC. An MI counselling approach was found more effective than traditional health education approach to prevent ECC.<sup>133, 134</sup> Therefore, understanding parent’s behavioural stage of change is important to help the practitioner in selecting and providing appropriate interventions to facilitate change in oral health behaviour.

## **2.4 Family health**

A family system has been defined as any social unit within which an individual is intimately involved, and which is governed by "family rules."<sup>135</sup> One key concept of the family system is that family members reciprocally influence each other over time.<sup>135</sup> In addition, family contexts adapt to the environmental conditions that lead to changes in family dynamics and in child-rearing practices. Parents adjust their child-rearing behaviours to the risks that they perceive in the environment, the skills that they acquire as caregivers, and their cultural and social expectations.<sup>136</sup> Therefore, powerful relationships exist between the social influences, family structure, and parental individual skills and values and, therefore, how well a family functions is tied to the quality of these

relationships.<sup>136</sup> These relationships are also critical components in shaping a child health and development. Research in Canada and the United States has consistently shown that parenting practices influence a range of childhood outcomes, such as aggressive behaviour, pro-social behaviour, academic achievement and high school completion.<sup>137</sup>

Parenting is a key component of family dynamic and two important elements of parenting that have been identified are parental responsiveness and parental "demandingness."<sup>138</sup> 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.<sup>139</sup> Parental "demandingness", i.e. behavioural control, refers to parents' demands, supervision, and disciplinary efforts and their willingness to challenge their child.<sup>139</sup>

Based on these two elements, four parenting styles have been defined<sup>139</sup> (Table 2.2): 1) *Permissive parents* who are more responsive than they are demanding. They do not require mature behavior, allow considerable self-regulation, and avoid confrontation. 2) *Authoritarian parents* are highly demanding and directive, but not responsive. They expect their orders to be obeyed without explanation. "Authoritarian parents" are generally controlling and sometimes harsh in their approach to discipline and can be seen as less flexible and lacking responsiveness and warmth in their interactions with their children. 3) *Authoritative parents* are both demanding and responsive. They teach and supervise clear standards for their child's behaviors. "Authoritative parents" monitor their children's behaviour, respond to their needs, set reasonable boundaries and encourage increasing independence. While setting firm limits with their children, authoritative parents present options, discuss alternative ways of behaving and encourage independence. 4) *Uninvolved*

*parents* are low in both responsiveness and demandingness. Parents develop different styles to cope with their parenting struggles. Most parents use a combination of styles; however, one style usually predominates.<sup>140</sup>

Research indicates that children raised in an environment of authoritative parenting are the least likely to exhibit signs of vulnerability<sup>1</sup>. This style is positively related to better behaviour and school performance. Positive parenting practices, as demonstrated by an authoritative style, also decrease the chances of developmental problems in Canadian children by 25 to 52%, depending on the type of developmental problem.<sup>142</sup> In contrast, researchers have found that inconsistent, non-positive parenting can lead to signs of vulnerability such as poorer school outcomes.<sup>143</sup>

An authoritative parenting style has also shown to be one of the most consistent predictors of healthy family behaviours.<sup>144</sup> Thirty-two families with obese children of 6–11 were provided a comprehensive educational and behavioural programme for a healthy lifestyle for 6 months. In their intervention, parents were encouraged to practice authoritative, or cooperative, feeding styles. Improvement in parental authoritative style tended to be associated with more weight reduction in children.<sup>144</sup> Therefore, children's family environments have a strong effect on a child's well-being. However, there is still much that is unknown about this complex relationship. Certainly, little is known about the interaction of the family system, the family environment and a specific, but serious, child health issue, like dental health.

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<sup>1</sup>The term "vulnerability" refers to young children who are experiencing either learning or behaviour difficulties. These children may have problems getting along with others, meeting challenges, regulating their emotions, attending to tasks, or learning new concepts or skills. The vulnerability index, developed in 2000, reveals that approximately 28% of Canadian children are vulnerable.<sup>141</sup> Willms JD. *Vulnerable children – Findings from Canada's national longitudinal survey of children and youth*. Alberta: University of Alberta Press, 2002.



**Table 2.2** Parenting style and its correlates (Baumrind, 1991)

	<b>Demandingness</b>	<b>Responsiveness</b>	<b>Consequences for children</b>
<b>Authoritative</b>	high	high	More socially and instrumentally competent
<b>Permissive</b>	low	high	Involved in problem behavior, less well in school, better social skills, higher self-esteem, lower levels of depression
<b>Authoritarian</b>	high	low	Uninvolved in problem behavior, moderate well in school, behavior, poorer social skills, lower self-esteem, higher levels of depression
<b>Uninvolved</b>	low	low	Poorly in all domains

## 2.5 Summary

Social cognition theories, specifically those presented in this chapter, have provided important frameworks that enhance our understanding of the determinants of a wide range of health behaviours and health behaviour change. However, theories of health behaviour have only been successful in explaining/predicting about 30% of behaviours.<sup>145</sup> In addition, considerable overlap exists between the constructs of health behaviour theories. Conner and Norman<sup>95</sup> have compared the models on an empirical and a conceptual level. They believed that the predictive power of these models is, in fact, quite similar. They also concluded that the self-efficacy construct is a key predictor of health behaviour in the models and behavioural intention acts as a mediating variable between other social cognitive variables and behaviour. Furthermore, they argued the overlap between the constructs included in the models. For instance, most models focus on outcome expectancies or the consequences of performing behaviour except HLC which fails to consider the perceived consequences of performing health behaviour.<sup>95</sup>

While the theories reviewed in this chapter have captured some of the important variables contributing to parental health behaviour, there are some shortcomings as well. First of all, new variables need to be considered by these models in terms of the family context such as “parental self-efficacy” (e.g. ‘How likely is it that I can perform behaviour X for my child?’) or “parental sense of responsibility.” Furthermore, these models have been labeled as “deliberative processing models” as they assume that, to some extent, behaviour results from a process of cognitive reflection.<sup>95</sup> However, parents practice many behaviours related to their child’s oral health that they simply may have learned from their own parents. It is argued that many health behaviours are determined not by social

cognitive variables, as outlined in the previous models, but rather by one's previous behaviour.<sup>146</sup> Therefore, we need to consider the role of parents' past behaviour as an immediate model for their future behaviour. However, parents may make a behavioural decision in a process of cognitive deliberation if they have the opportunity and the motivation to do so. The question is whether the formation of a behavioural intention is enough for the successful enactment of behaviour or are further cognitive activities required to ensure that intention will be translated to action.

This brief review of the theories most commonly applied to oral health behaviours and most relevant to the present project demonstrates that each theory has proven successful in certain situations, but that each has some limitations. In other words, there is no theoretical framework particularly applicable to parental oral health behaviour that explains all aspects of behaviour change. Having a theoretical model of the process of parental oral health behaviour change is critical in developing meaningful plans to improve oral health for our most vulnerable child populations. These families are often not in a position to embrace healthy living and need assistance to adopt adequate health behaviours or to change existing unhealthy behaviours. We need a model tailored to the needs and beliefs of these vulnerable populations. Developing a modified oral health behaviour model is required to guide dental health practitioners in assisting these at risk families.

Health behaviour change is a process that needs to be based on appropriate, thorough, and high quality theory. As Hochbaum and colleagues have stated:<sup>126</sup>

"Any profession that is not based on sound and continuously evolving theories that yield new understanding of its problems and yield new methods is bound to stagnate and fall behind in the face of changing challenges."

## **CHAPTER III**

### **METHODS**

In this chapter, I introduce the main research objectives and outline the preliminary research questions. Then, I briefly discuss our methodology (the theory or theories that “underpin” what has been done). Finally, the actual methods which are the particular techniques used to collect and analyse the data will be discussed.

### **3.1 Research objectives**

This study was designed to:

- 1) develop a theory regarding the behaviours of parents that may affect their child’s risk to caries relapse after oral rehabilitation under GA; and
- 2) better understand the process of parental behaviour change related to their child’s dental health.

However, we cannot understand parents’ behaviours without understanding the framework in which they process their thoughts, feelings, and actions. Furthermore, external events and circumstances probably have an effect on parents’ behaviours. For example, the event of general anaesthetic surgery to complete a child’s dental work may or may not be a “cue to action” that leads to change in parent’s behaviours. Therefore, I am interested in exploring the early and long-term effect of general anesthesia on parental behaviour change.

### **3.2 Preliminary research questions**

To explore the above issues, I formulated the following primary research questions:

1. What are the beliefs, attitudes, and behaviours of parents that may place their child at risk to developing further dental decay?

2. How do parents experience their child's dental GA? How do they perceive the impact of this experience on their child?
3. What is the early effect of the GA on parent's oral health behaviours?

However, as the study progressed and the early interviews were analysed, the primary questions were modified and additional questions became of interest. For example:

- 1- What is the long-term effect of GA, if any, on both parents and their child's oral health practices?
- 2- What barriers do parents face in maintaining healthy behaviours over time?
- 3- What factors facilitate changes in parent's oral health behaviours?

In chapter 2, I reviewed the most commonly accepted and relevant theories or models of social cognition that enhance our understanding of the determinants of health behaviours and health behaviour change. However, none of these theories or models seems to be able to fully explain the different aspects of parental behaviour change in the context of their child's dental health. The phenomena of ECC, GA experience, parental behaviour change, and caries relapse do not seem to "fit" with any of the accepted and tested theories of health behaviour. Therefore, we need to develop a theoretical framework that is implicitly grounded in our specific research situation.

Given that my research questions attempt to describe "*what is going on*" in the situation of caries relapse after a child's dental GA, a qualitative approach is a good way to help us to determine those variables unlikely to be identified by a quantitative approach.

### **3.3 Methodology: Qualitative research**

The word "qualitative", as defined by Denzin and Lincoln:

“... implies an emphasis on processes and meanings that are not rigorously examined, or measured (if measured at all), in terms of quantity, amount, intensity, or frequency.”<sup>81</sup>

Qualitative research employs a naturalistic approach that seeks to understand a phenomenon in a context-specific setting such as a “real world setting where the researcher does not attempt to manipulate the phenomenon of interest.”<sup>147</sup> Another definition of qualitative research is that of Strauss and Corbin (1990):

“Any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification.”<sup>148</sup>

Unlike quantitative researchers who search for causal determination, prediction, and generalization of findings, qualitative researchers seek illumination, understanding, and exploration of similar situations. Qualitative research is descriptive in that the researcher is interested in process, meaning, and understanding gained through words or pictures. The process of qualitative research is inductive as the researcher builds abstractions, concepts, hypothesis, and theories from details.<sup>147</sup>

Why do some researchers prefer to do qualitative research? The reasons that Strauss and Corbin suggested are:

“.... preferences and/or experience of the researchers. Some researchers come from disciplines (e.g. anthropology) or have philosophical orientations (e.g. phenomenology) that traditionally make use of qualitative methods<sup>1</sup>. Another reason, and probably the more valid one, is the nature of the research problem.”<sup>149</sup>

The importance of qualitative methods in understanding the meaning or the nature of people's daily experience is further defined by Strauss and Corbin. Qualitative methods can also be used to explore substantive areas about which little is known or to gain novel

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<sup>1</sup> **Methods:** A set of procedures and techniques for gathering and analysing data (Strauss and Corbin, 1998).

understandings about areas which are well-known.<sup>150</sup> qualitative methods are also used when the purpose of study is to examine a phenomenon from the point of view the people who experience it and are a part of it.<sup>81</sup> In addition, using qualitative methods, we can unearth the intricate details about phenomena such as feelings, thought processes, and emotions that are difficult to extract or learn about through more conventional research methods.<sup>150</sup> Denzin and Lincoln in their "Handbook of Qualitative Research" state:<sup>81</sup>

Human behaviour ... cannot be understood without reference to the meaning and purposes attached by human factors to their activities. Qualitative data ... can provide rich insight into human behaviour [by] uncovering emic (insider) views. (p.106)

The components of qualitative research have been divided into three categories.<sup>148</sup> The first component is *data* which can be gathered through interviews, observations, documents, records, and videos. The second component is *procedures* that researchers use to interpret and organize the data such as conceptualizing and reducing data, elaborating themes, and exploring the linkage among the themes. These procedures are often referred to as "coding." Other procedures that are part of the analytic process such as sampling, writing of memos<sup>1</sup>, and diagramming are also considered in the second component. Finally, written and verbal *reports* about the research make up the third component.<sup>149</sup>

### **3.3.1 Understanding parenting behaviours and child's health**

In all aspects of health, parents have different understandings of well-being, which affect the health behaviours that they initiate for their child. Recognizing and respecting how a parent understands child well-being may help health care providers plan strategies to

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<sup>1</sup> **Memos** are the researcher's record of analysis, thoughts, interpretations, questions, and directions for further data collection data (Strauss and Corbin, 1998).



establish healthy behaviours for high risk families and, therefore, facilitate a more successful delivery of preventive interventions to young children in such families. Roden (2003) in a qualitative descriptive study observed two kinds of families who practice health differently: those with a “health promotion” focus, and those with an “illness-prevention” focus. The “health promotion” families have a broader concept of health compared to the “illness-prevention” families. The study found that most families with preschool-aged children were engaged in “illness prevention” rather than “health promotion.” Unlike those families focused on “illness prevention”, families who focused on a “health promotion” mode were more sophisticated in their educational strategies and used more strategies associated with developing their child’s health behaviours.<sup>106</sup>

In the past decades, qualitative research has also provided health care researchers with rich descriptions of parent’s everyday experiences of their child’s health struggles.<sup>151,</sup>  
<sup>152</sup> The importance of a better understanding of parent’s beliefs about their child’s health and their expectations has been repeatedly appreciated by investigators.<sup>151, 153</sup> Many efforts to manage chronic diseases in children have failed because parent’s beliefs and concerns have not been taken into account.<sup>151</sup> This lack of inclusion of parental concerns was explored in a recent qualitative study of parental beliefs, knowledge, and attitudes about managing their child with asthma.<sup>151</sup> Parents in this study requested that health care providers respect and value their knowledge about their child and how they manage asthma on a day-to-day basis.

### **3.3.2 Understanding ECC**

Over the past decade, many investigators have come to realize that little is known about parent’s beliefs, concerns, and understandings of ECC.<sup>16, 79, 154, 155</sup> Despite this gap in our

knowledge, substantial literature has emerged related to prevention and management of ECC and caries relapse. However, one of the reasons that ECC intervention strategies have not achieved success may be because the basic principles of behavioural theory were not acknowledged or addressed. The health education model has been dominant in our approach to programs designed to prevent ECC. However, the limitations of purely educational interventions to produce sustained improvements in oral health of our most vulnerable child populations have been clearly identified.<sup>59, 156</sup> Therefore, designing an intervention to control ECC or caries relapse in young children requires a sound theoretical or conceptual framework, which identifies and connects the variables that influence how parents “manage” their child’s disease.

Most previous analyses of parental beliefs and behaviours in relation to ECC have been quantitative studies<sup>71, 76, 133</sup> which have not explored behaviour “in-depth.” A qualitative approach may enable us to identify a greater range of variables by focusing on the process of behaviour change in a natural setting. This approach will help to address some of the gaps in our current knowledge, to provide new insights into the multidimensional issues related to ECC and caries relapse, and to improve our understanding of how to facilitate changes in behaviour.

### **3.3.3 Previous qualitative studies related to children’s dental health**

There have been some noteworthy studies that have used a qualitative approach to better understand children’s dental health. The themes of these studies were:

1. Parents’ cultural beliefs, attitude, and behaviours about their own and their child’s oral health.<sup>79, 154, 155, 157, 158</sup>
2. Parents attitudes and perceptions about dental care and access to care.<sup>158-161</sup>

These studies were conducted to identify some of the risk factors that affect dental health of children. Fortunately, a number of these investigators specifically assessed parents' dental beliefs, behaviours, and experiences related to early childhood caries and have provided sensitive and useful information.<sup>79, 155, 157, 158</sup> Not valuing baby teeth and a parent's negative dental experience were identified as factors underlying parent's dental health beliefs and behaviours.<sup>79, 157</sup> A poor overall understanding of the effect of prolonged exposure to sugared drinks in feeding bottles and cups and concern over the use of bottles and their effect on the development of the occlusion were also recognized.<sup>158</sup> Parents who believed that dental decay was caused by too much sugar and prolonged bottle use also believed that problems with baby teeth would disappear with eruption of the adult teeth.<sup>157</sup> Dental visits were rare in very young children unless obvious decay or pain was present.<sup>157</sup> Although parent's dental treatment often resulted in unpleasant dental experiences, there was satisfaction with preventive and routine dental care.<sup>155</sup> Mothers were generally interested in learning about new preventive strategies to reduce dental disease.<sup>79, 158</sup>

An overall conclusion from these studies is that the struggles of parents and the barriers they face in the process of adopting preventive behaviours must be appreciated in the planning of preventive interventions. Yet, no studies have explored parents' own perspectives of the barriers and challenges that they face "to do the right thing" in relation to their child's dental health nor have the supports that they need to overcome these obstacles been investigated. Furthermore, little is known about what motivates parents to

“take action” and to specifically modify their oral health–related behaviours, and what is needed to help parents to maintain these changes.

### **3.4 Methodological perspective for the present study**

A qualitative method of inquiry was undertaken to explore parents’ perspective of their child’s dental health and the impact of the event of a dental GA on their subsequent behaviours related to their child’s oral health. Many different approaches<sup>1</sup> to doing qualitative research exist. Of the various qualitative research methods, the grounded theory (GT) method has been identified not only as highly rigorous, but also as a method that promotes the inductive development of theory that is grounded in the data. Therefore, GT was chosen as the most appropriate research method that would enable me to conceptualize the thoughts and practices of parents that emerged from the information provided by the interviews. A grounded theory approach facilitated exploration of the possible motivators and barriers that promote or impede the process of behaviour change and the integration of these factors into a conceptual theory.

#### **3.4.1 The grounded theory method**

Grounded theory (GT) is a systematic approach to data collection and analytic procedures with the aim of developing an inductively derived theory from the data.<sup>162</sup> This theory is discovered from the actual data collected, in contrast to a theory<sup>2</sup> that is developed conceptually and then simply tested against empirical data. The methodology of grounded theory was initially presented by two sociologists Anselm Strauss and Barney Glaser in

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<sup>1</sup> A **qualitative approach** is a general way of thinking about conducting qualitative research. It describes, either explicitly or implicitly, the purpose of the research, the role of the researcher(s), the stages of research, and the method of data analysis.

<sup>2</sup> **Theory** is a set of explanatory concepts which offer a variety of ways of looking at the world (Glaser and Strauss 1967).

the 1960s for the purpose of studying social phenomena from the perspective of symbolic interactionism<sup>1,162</sup> In 1990, Strauss and Corbin deviated from this original method. Although they maintained the essentials of the original GT, some differences were proposed in the "new" method. They provided a set of techniques and guidelines and suggested a new coding process using:<sup>148</sup>

"... a coding paradigm involving conditions, context, action/interactional strategies and consequences." (p. 96)

Strauss and Corbin's approach has been criticized for being procedural, hard to do, and cumbersome in the number of steps they outlined;<sup>163, 164</sup> however, this new approach was a response to the pressure of increasing numbers of graduate students asking for more precise instructions about the method.<sup>165</sup>

This undermining of the original principles for grounded theory research, called "generational erosion,"<sup>166</sup> has become the center of debate on the GT method. However, the dispute has raised questions about the nature of the method which has resulted in more clarification of the purpose and spirit of GT by the originators and others. The discussion has also opened up the possibilities for the development and evolution of this method.

Grounded theory is a complex, iterative process. Glaser argues that:

"Grounded theory is not findings, but rather is an integrated set of conceptual hypotheses ... however, in practice soon after generating, grounded theory is often treated as description based on findings. In a substantive grounded theory, the integrated set of hypotheses account for much of the behaviour seen in a substantive area."<sup>164</sup>

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<sup>1</sup> *Symbolic Interactionism*, as defined by Herbert Blumer (1969), is a theory about human behaviour; it is an approach to the study of human conduct and human group life. It is concerned with the meaning of the events to people and the symbols they use to convey those meanings.

He emphasizes that GT is the discovery of what is there and what comes into view. It is not "invented". Eaves (2001) has summarized the assumptions of GT inherent in Glaser and Strauss and others' writings as:<sup>167</sup>

- The inquiry is structured by discovery of social and social psychological process.
- Data collection and analysis phases of research proceed simultaneously.
- Both the processes and products of research are developed from the data rather than from preconceived theoretical frameworks.
- The analytic process prompts theory development rather than verification of pre-existing theories.
- Theoretical sampling refines, elaborates, and exhausts conceptual categories.
- Grounded theory methodology is not only aimed at studying processes, but also assumes that making theoretical sense of social life is itself a process.
- The systematic application of GT analytic techniques leads progressively to more abstract analytic levels."

In order for grounded theory to have any practical application, whether substantive or formal, it needs to have four highly inter-related properties. First, a soundly assembled grounded theory should have "fit", meaning that:<sup>162</sup>

"The theory must closely fit the substantive area in which it will be used."  
(p.237)

A theory has "fit" if practitioners, researchers, and participants similarly agree that the theory is convincing and reasonably explains the actual experience or events. Second, the theory must be "understandable":<sup>162</sup>

"The theory must be readily understandable by people concerned with this area." (p.237)

In his 1992 work, Glaser changed "understandable" to "workable". It means that the theory takes into account and interprets the major variations of experience or events across all participants without overcompensation. In other words, a theory works if it

successfully balances “scope and parsimony”, accounting for as much variation in behaviour with as few distinct classifications and divisions as possible.<sup>163</sup>

The third property is “generality”:<sup>162</sup>

“A theory should be sufficiently general to be applicable to a multitude of diverse daily situations within the substantive area, not in just a specific situation.” (p.237)

Glaser (1992) proposed that if a theory has fit and it works, then the theory will increase our understanding of a phenomenon and, therefore, the theory is relevant. And the final property is “control”:<sup>162</sup>

“The theory must allow the user partial control over the structure and process of daily situations as they change through time.” (p.237)

In other words, the theory should be “readily modifiable”, meaning that the researchers should be prepared at anytime to modify their theory in order to capture emergent qualities of the experience or events witnessed in their study.

Despite the current debate about the “correct” rendition of the GT method, the overall objective of the GT method, which is the extensive conceptual understanding of the substantive area under study, has remained intact. While I have attempted to adhere to the original principles of GT including constant comparison, theoretical sampling, emergence and discovery, I found the Strauss and Corbin approach more manageable for “novice” grounded theorists. Therefore, I selected the analytic tools and the coding procedures that they developed for my data analysis.

### **3.5 Methods**

Applying the GT method to research requires the simultaneous and integrative collection, analysis, and conceptual theorizing of data from the beginning of the research process.<sup>148</sup>

The process of data collection and data analysis in grounded theory is a “zigzag process—out to the field to gather information, analyze the data, back to the field to gather more information, analyse the data and so forth.”<sup>168</sup> This is the method of constant comparative analysis, for which grounded theory is known. Constant comparative is a constant process of coding, sorting, and categorization. The study begins with generating research questions which help us identify a series of phenomena needed to be studied. In the present study, the phenomena of ECC, GA experience, parental behaviour change, and caries relapse were explored. I explain the process of data collection and data analysis separately in the next two sections to make the descriptions more clear. Data collection ends when the researcher believes that saturation has been achieved.<sup>81, 168, 169</sup>

#### **3.5.1 Data collection**

Semi-structured, open-ended, one-on-one interviews were used to collect a range of parents' views related to their child's oral health. A short questionnaire also recorded information about demographics, child's feeding habits, and child's dental history (Appendix 8-3). Dental health status of the children before GA (expressed as decayed, missing, filled surfaces or dmfs), information on severity of caries (e.g. number of extractions at GA), and any new carious lesions at 6-month or one-year follow-up were also recorded from the clinic chart.



### **3.5.1.1 Setting**

The project was conducted at Monarch Paediatric Dental Centre, a paediatric dental practice in Burnaby, British Columbia. This private practice has an on-site general anaesthetic suite. Although the dental centre is a private practice, the costs of treatment, either with or without GA, are fully or partially supported by publicly-funded programs. All referrals to this specialty practice by general dentists were because of the child's behaviour management issues and the need for extensive dental rehabilitation which included restorative dentistry and possibly extraction of teeth.

### **3.5.1.2 Selective sampling**

Strauss and Corbin explain that data collection should be done in a way that will discover as many variations as possible among concepts in order to strength the categories. They also pointed out that the initial or selective sampling should be based on selection of individuals who are the most informed about the phenomenon of interest in order to get the clearest possible picture of it.<sup>148</sup> Therefore, the original families included in the study were English-speaking parents from a variety of ethnic backgrounds whose children had recently been treated under GA at Monarch. Because our "working" definition of ECC<sup>1</sup> was limited to children less than 6 years of age only parents of children under 6 years old were recruited for the study. Of the parents approached to participate, a small number refused, primarily because of time constraints. Given the sizable proportion of Chinese families in this dental practice and in the surrounding community and because of the initial limited response from Chinese parents to the invitation to participate, a group of Chinese-speaking parents were approached and subsequently interviewed by a Chinese-

speaking interviewer. Following an initial selective sampling, as the research progressed, a somewhat different procedure called “theoretical sampling” was also used.

### **3.5.1.3 Theoretical sampling**

In qualitative research, sample selection has a profound effect on the ultimate quality of the research. In GT, samples should be selected according to the principle of “theoretical sampling” which is referred to as:<sup>149</sup>

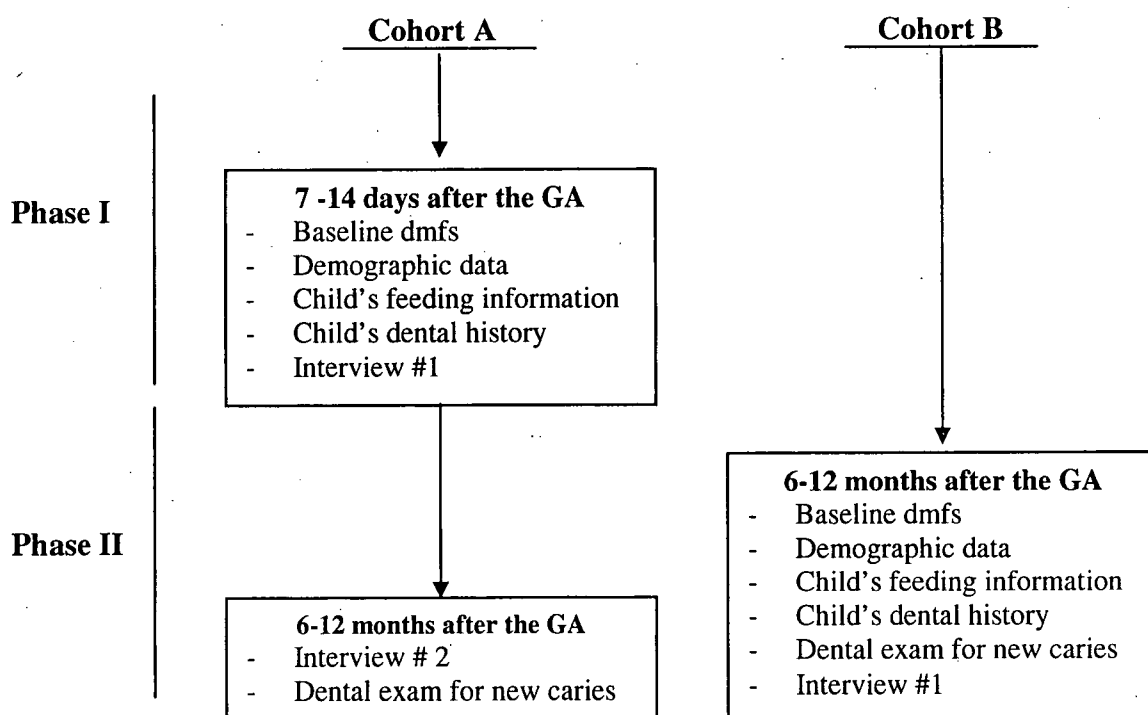
“... a means whereby the analyst decides on analytical grounds what data to collect next and where to find them. The basic question in theoretical sampling is: what groups or subgroups of populations, events [or] activities one turns to next in data collection is controlled by the emerging theory.” (pp. 38-39)

Theoretical sampling is sampling on the basis of emerging concepts. Unlike the sampling common to quantitative investigations, theoretical sampling cannot be planned before embarking on a grounded theory study. The specific sampling decisions evolve during the research process itself.<sup>148</sup> In other words, sampling tends to become more purposeful and focused as the research progresses.

In the present study, after the preliminary analysis of the first set of interviews, it appeared that the GA experience had an emotional effect on both the parents and their child. Some sort of negative reaction to the GA was reported by all parents and their children. The experience propelled parents to take action and to engage in preventive strategies such as altering feeding behaviours and/or oral hygiene practices. While most parents experienced satisfaction with the outcomes of GA (dental and behavioural), at the same time they were somewhat overwhelmed by difficulties in applying new healthy behaviours. The question arose as to whether the immediate adoption of healthy

behaviours shortly after the GA was “positively” influenced by this “negative” GA experience, and whether the effect will be long-lasting. Therefore, I invited the original families from Cohort A (interviewed shortly after GA) to participate in a second interview one year after the GA (**Figure 3.1**). Accordingly, because I was curious about parents’ actions and behaviours long after the GA, I developed a new set of questions which I asked in the subsequent interview. In this case theoretical sampling generated rich data that strengthened the categories that emerged from phase I as well as new concepts regarding parent’s perceived motivators and barriers to adopt or maintain new healthy behaviours over time.

**Figure 3.1** Overview of Study



In addition, any time a new concept emerged from a new interview; all previously analysed transcripts were reviewed again in order to look for concepts or categories that may have been overlooked before. For example, in interview #7 the mother described how her son was emotionally hurt because of the extraction of a number of teeth. She repeated this incident several times in the interview, which means losing teeth was a big “deal” for her and her child. Because this mother described this part of her GA experience in a vivid and powerful way, I decided to go back to my previous interviews to explore the children’s reaction to tooth extraction that I earlier may have overlooked. This finding also encouraged me to explore a child’s reaction to multiple extractions in the later interviews as well.

#### **3.5.1.4 Description of the participants**

Of 19 participants, eleven were interviewed once and 8 were interviewed twice. I approached the English-speaking families about the study at the time of the GA appointment. Only 2 mothers of Chinese origin accepted the invitation; one mother was born in Canada, the second mother had a Caucasian husband. Considering the proportion of Chinese families treated in this clinic and living in surrounding communities, a group of Chinese-speaking parents were approached and subsequently interviewed by a trained Chinese-speaking dental student. Overall, 6 families were interviewed in Chinese and 3 families of Chinese origin were interviewed in English (Table 3.1).

**Table 3.1** Description of the participants

Families	Cohort A1 = 15		Cohort A2 =8		Cohort B =3		Interviews
	Chinese	Non-Chinese	Chinese	Non-Chinese	Chinese	Non-Chinese	
Relapse = 10	1	5	Ø	3	3	Ø	12
No relapse = 9	5	4	2	3	Ø	Ø	14
Total =19	6	9	2	6	3	Ø	Total =26

I did not limit the study to only mothers. I approached the parent who was present for the GA. Fifteen mothers and 4 fathers agreed to be interviewed. In one family, both parents participated in three interviews, two individual interviews and one together. Except for one single mother, the rest of the participants were married. One father was also in the process of divorce. Two families only had one child, ten families had two and five families had three children. The mothers ranged in age 26 to 45. Fourteen of 19 mothers were born outside of North America and the families had immigrated to Canada between 2 and 29 years prior to the time of interview. The mother's level of education was either high school completion or some type of post-secondary education (Table 3.2).

**Table 3.2** Participants' demographic information

Name	Mother <sup>1</sup> Age	Mother's education	Ethnic background/ Spouse	Years living in Canada	Number of children
Marina	33	College/ Vocational school	Eastern European	29	1
Carl	35	Completed high school	Caucasian /Mexico	35	2
Edith	34	College/ Vocational school	Filipino	14	2
Cathy	35	College/ Vocational school	Chinese (born in Canada)	35	2
Tan	35	Completed high school	Vietnamese	2	1
Elsa	44	College/ Vocational school	Chinese/ Caucasian	15	3
Angela	34	Completed high school	Caucasian	34	3
Jade	26	Completed high school	First nation	26	2
Vilma	47	Completed high school	Filipino/ polish	14	2
Mirosław	47	Completed high school	Polish/ Filipino	14	2
Azmina	45	College/ Vocational school	East India	20	2
Gurwinder	29	College/ Vocational school	India (born in Canada)	29	2
Julie	36	College/ Vocational school	Chinese	N/A	2
Wencheng	34	Completed high school	Chinese	N/A	2
Maggie	40	Completed high school	Chinese	N/A	2
Susan	36	College/ Vocational school	Chinese	5	3
Franck	N/A	Completed high school	Chinese	3	3
Jackie	48	Completed high school	Chinese	N/A	3
Yin	N/A	College/ Vocational school	Chinese	N/A	3

<sup>1</sup> Only maternal age was recorded in the questionnaire

### **3.5.1.5 Study design**

Approval for the study was received from the Behavioural Research Ethics Board of UBC (Appendix 7-1) and was continually amended as the project progressed and evolved. I recruited the parents for the study in conjunction with Monarch staff. Similar to any qualitative project, the design of the present study was emergent and dependent on the results as the study progressed.

**3.5.1.5.1 Phase I (Immediately after the GA):** The parents who were interviewed 7-14 days after the GA were called "Cohort A." The objectives of these interviews were to explore:

1. Parents' beliefs and attitudes about dental health,
2. Parents' experiences of their child's treatment under GA and their perception of the impact of this treatment on physical, psychological, and social aspects of the daily life of their child; and
3. Parents' readiness to adopt and maintain preventive behaviours following their child's GA experience.

At the time of GA appointment, I informed the parents about the study. If parents appeared to be interested, they were given the letter of initial contact (Appendix 7-2-1), which explained the purpose of the study. Interested parents completed a "parent contact" form (Appendix 7-2-2). Interviews were scheduled at the convenience of the participants at 7 to 14 days after the surgery day. All participants gave informed consent (Appendix 7-2-3) under principle of full disclosure and were given a copy of the consent form prior to

the interview. The interview guide and questionnaire were pre-tested by interviewing two volunteer mothers before performing the actual interviews.

#### **3.5.1.5.2 The first interview**

A semi-structured interview guide was developed to help me direct the interviews (Appendix 7-4-1). The guide allowed me to be open to any new information that came up or that I had not thought about before the interviews. The questions began as open-ended, but tended to become more specific and refined as the research progressed. The questions were also changed over time and were based on the evolving theory.<sup>149</sup> All interviews were conducted either in a quiet area of the dental office or in the child's home. For the interviews that the child was present, sometimes parents got distracted and they did not seem to be focused on the interview. Therefore, I provided some toys to keep the child busy and to avoid any interruption.

Before starting the interview, I asked a parent to complete a short questionnaire that helped to describe their demographics. If any contradictions appeared between the qualitative data from the interviews and quantitative data from the questionnaire, I explored it in the interviews.

My goal in each interview was to create a relaxed atmosphere that would encourage the participants to share their experiences with me. I used open-ended questions and shared my own experiences as a mother to reflect on their statements and express my empathy. I try to avoid judgment, professional opinion giving, and advice giving. The interviews usually started with a 5-minute "warming-up" talk related their family, their work or daily news. I then proceeded to ask about the parents' oral health, what oral health



meant to them and their personal experiences of dentistry, what they liked and what they did not like to explore their own perception of oral health. Then, I specifically asked about their child's oral health to examine their knowledge about their child's oral health and to explore their thoughts about the importance of primary teeth.

The next set of questions focused on the child to better understand the child's quality of life before and after the GA experience. Parents' beliefs about how much their actions or dental professionals' interventions may actually affect their child's dental health were then pursued. To assess a child's oral health-related quality of life<sup>1</sup> after the surgery, not only issues concerning function, pain and discomfort, but also social and psychological issues were explored. The parents' efforts to improve their child's dental health and the barriers that they faced in adopting dentally-healthy behaviours were investigated. The effectiveness and acceptability of preventive methods recommended by dental staff and parental openness to preventive interventions were also explored.

The first few interviews were fairly broad while the later ones became gradually more focused and explored particular concepts that had emerged in the previous interviews and that might be included in an evolving theory. The interviews lasted between 25 to 50 minutes. At the end of each interview, the key points were summarized, repeated back to the parents, and modified as necessary; parents were also invited to add any other issues that they felt were important and had not been addressed within the interview. Finally a verbal consent was taken from them for any further contact.

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<sup>1</sup> Used in the context of a medical condition, quality of life refers to the overall status of a combination of factors: a person's health, symptoms, and level of physical and social functioning. If an illness and its treatment have a negative impact on a person's sense of well-being and ability to perform daily activities, then quality of life may be poor.

**3.5.1.5.3 Phase II (one year after the GA):** The specific objectives of phase II were exploration of:

1. Parents' understandings of their child's oral health and how these views compare to those expressed at the first interview.
2. Challenges and supports parents have had with managing their child's oral health and how they identify and understand these issues in comparison to the first interview.
3. The long-term effects, if any, of the GA on parenting practices related to improving and changing behaviours

Cohort A parents were invited to a second interview. A modified interview guide based on the objectives described was compiled for their second interview (Appendix 7-4-2). Some of the Cohort A children demonstrated new carious lesions at 6-month follow-up; the remainder were caries free. Because few of the Cohort A parents whose children had new caries at recall consented to a second interview, new participant parents, who we called Cohort B, were recruited and interviewed for the first time 6 to 12 months after their child's GA (**Figure 3.1**). Only families whose child had new cavities at 6-month recall and/or were scheduled for a second GA were approached to be part of Cohort B for this interview. A slightly-modified version of the original interview guide was used for Cohort B. Furthermore, I wondered whether Cohort A parents, when originally interviewed so soon after the GA, might be unwilling to admit their challenges and barriers to adopting healthy behaviours. They might have not wanted to contemplate the possible failure of their efforts. Therefore, the responses of the second cohort, or Cohort

B, were compared to the original "baseline" responses of Cohort A and to the Cohort A responses at 6-12 month follow-up.

The responses of parents of children with new caries, called the "relapse" group, were also compared to responses of parents who were "cavity-free" at one-year, called the "no-relapse" group. Parents differing journeys following their child's GA and their attempts to adopt the necessary behaviours to prevent caries relapse and to improve their child's oral health were explored.

### **3.5.2 Data management**

Only the candidate, the supervisor, and the transcriber had access to the raw data. Tapes sent for transcription had only the participant's first name as a source of identification. The data was always analyzed across the entire sample. No "case" analysis was performed or reported. The raw data was stored in a locked filing cabinet in a secured office at the University of British Columbia. After 12 months of dead storage, the audiotapes and the transcripts will be destroyed. Presentation of study findings through journal publication and meeting presentations will not identify participants individually.

### **3.5.3 Data analysis**

As Strauss and Corbin (1998) suggested, a coding paradigm was used to identify the concepts and the relations among them. Before data analysis, the interviews were transcribed verbatim. After conducting each interview, I transcribed it right away and then I proceeded to conduct the next interview. I repeated this process for all 11 interviews in the phase I. Finally, I conducted another 7 interviews in the phase II (6 to 12 months after the GA). The transcription of the phase II interviews was done by a professional

transcriber. In addition, a Chinese-speaking dental student conducted 8 more interviews with Chinese families who preferred to be interviewed in their original language (Table 3.1). Then the interviews were translated into English for analysis. Correctness of translations was verified by another bilingual Chinese individual.

After each interview, I also documented my ideas and thoughts on the interview either on the process or on the parent's comments and I wrote memos whenever a thought, an idea, or a question came up for me. Following is an example of a memo I wrote after a few interviews:

**Memo: An example**

I was really surprised about the amount and the accuracy of the knowledge some parents had related to their child's oral health. For example, some comments regarding the right time for a child's first dental visit was exactly the same as the CAPD recommendation. They also seemed to be aware about the role of bottle-feeding, brushing, and sugar in caries process, but nobody really talked about the microbial nature of the process. Now, I am wondering, if they knew that dental decay is a transferable infectious disease, would they do anything differently? Perhaps, I should have explored this issue a little further.

The memos evolved after each interview and as analysis proceeded. These notes also sometimes guided further investigation.

### **3.5.3.1 Open coding**

Open coding is done through reading a transcript and assigning codes line-by-line.<sup>149</sup>

Therefore, open coding was used as the initial step in analysing the interviews. Open coding began with the examination of each line or set of lines and naming the actions or events found within them. For each line it was attempted to explore "what was the major idea brought out in this sentence?" or "what was the conceptual definition of the code?"

An example of open coding is as follows:

Open coding: An example	
Child's need	Child's security
<i>They become very attached to it [breast/bottle-feeding], just like a security; I</i>	
	Permissive mothering
<i>didn't try to break them away, it's very hard to say no no, I find it very hard to</i>	
	Mother's oversensitivity
<i>say no to my children, I say no when I know it's appropriate to say no, but with</i>	
	Child rearing beliefs
<i>nursing Stuff, it's just hard. I thought they are gonna stop when they want to</i>	
	Child rearing beliefs
<i>stop, they won't want it any more, but finally, at 3 that was enough, when they</i>	
	mother's sense of responsibility
<i>start helping themselves, that was it!</i>	

### 3.5.3.2 Axial coding

Data fractured during the open coding was reassembled in “*axial coding*”. Axial coding is

“... the process of relating categories to their subcategories, termed ‘axial’ because coding occurs around the axis of a category, linking categories at the level of properties and dimensions.”<sup>149</sup> (p 123)

A listing was made of the identified codes from the open coding. Similar codes were grouped together to create clusters. Clusters were then reduced into meta-clusters with labels and the labels became concepts. Names of the concepts came from the pool of codes already discovered in data, e.g. child-rearing beliefs; or from the literature, e.g. “permissive” mothering, or from the “*in vivo*” codes, e.g. child’s “security.”

Once I opened up the text and identified some concepts, similar concepts were grouped under the most abstract higher order concept, based on its ability to explain “*what is going on*” to develop categories and subcategories.<sup>148</sup> Grouping concepts into categories is important because it enables the analyst to reduce the number of concepts. Once a

category was identified, it was developed in terms of its specific properties and dimensions. Through description of properties and dimensions, the subcategories were identified and the categories were differentiated from other categories.<sup>149</sup> Categories and subcategories were adjusted to accommodate new information contained in the incoming interviews. This process continued until no new information was collected and no new categories were detected.

The emerging of "normalizing the disease" as a concept

Gurwinder: *"Honestly, I think an odd cavity is OK, because I don't think there is anybody out there without a cavity."*

Julie: *"It [dental decay] is a problem but that kind of problem that I can accept because it's so common."*

Maggie: *"It is very easy to get cavities because the chance of getting cavities is much higher when we have so many teeth."*

Throughout the analysis, I used a process of "constant comparison" which involves systematically comparing different units of data.<sup>149</sup> "Constant comparisons" initially compares or looks for similarities and differences in the data from one participant; then it compares similarities and differences among participants, such as their views, behaviours, perceptions, and experiences. Later, the new data will be compared with previously defined categories, and a category will also be compared with other categories. Therefore, the entire interviews were perused to find the similarities and differences among the interviews and to avoid an unwieldy number of unrelated labels.<sup>149</sup> As categories were identified and defined; the original theoretical framework was formed, which in turn, generated more questions and further data collection and analysis. In addition, the

comparisons of similarities and differences between the responses of the “no-relapse” and “relapse” families guided the further analysis and led the original theoretical model to develop and become more comprehensive. This process was continued until the concepts and propositions were cohesive and saturation has been reached (i.e. no new information would emerge).

At that stage, the relationships among the categories were identified and the propositions describing these relationships were stated. As the analysis progressed, it became obvious that some categories were richer than others and their properties seemed to be more dissimilar between the “relapse” and “no-relapse” group. Other categories were increasingly becoming more peripheral and appeared to be similar for both groups.

#### **3.5.3.3 Selective Coding**

The final step was advanced coding, called “selective coding” by Strauss and Corbin (1998) and “theoretical coding” by Glaser (1978). In this stage, the categories were positioned in the theoretical model so as to represent their place in relation to other categories. The central explanatory category, which seemed to be core to the phenomenon under investigation, i.e. parental behaviour change, was identified. Then major categories were related to the core category through explanatory statements of relationships. Once a theoretical scheme was outlined, the theory was refined. The excess was trimmed off and only categories directly related to the guiding questions were kept for further analysis. Poorly developed categories were filled until saturation was achieved through further theoretical sampling.<sup>149</sup>

#### **3.5.4 Establishing trustworthiness**

The grounded theory method, itself, provides researchers with a number of procedures and techniques to support the credibility of data. Examples of these techniques are the method of verbatim quotations and constant comparisons. In GT, researchers remain very close to the data, choosing representation over interpretation. Categories are developed directly from the narrative, and as the level of abstraction increases, the researchers confirm the portrayal by returning to the raw data. Core categories are identified through the support provided by this method of constant comparison analysis. The write-up of the results should provide enough details to allow the readers to follow the progression from data to core category.<sup>162</sup>

In the present study, several techniques were utilized to support the credibility of the findings. First, open-ended non-leading questions were used to establish more truthful responses. Data was collected from other sources in addition to the interviews including observations, fieldnotes, and a quantitative questionnaire. For example, the type of preventive counselling given to parents by Monarch professional staff was observed and compared with parents' recollections of what occurred. In addition, a second interview with some families provided the opportunity to confirm and/or clarify statements made in their first interview.

Audio-taping and transcribing the interviews also helped to ensure that the data collected was accurate. All the transcriptions were checked by two individuals (transcriber/candidate, candidate/supervisor) to ensure accuracy in documentation of the data. The conceptualization of parents' statements and the interpretation of data were also reviewed by the supervisor and committee advisors. In addition, three Monarch dentists



were interviewed to explore their views and opinions about our findings from the analysis of interviews with the parents.

The final step was to validate our theoretical scheme. Although the theory emerged from data, by the time of integration, it represented a conceptual interpretation of that raw data. Therefore, Strauss and Corbin emphasize that:

“It is important to determine how well the abstraction fits with the raw data and also to determine whether anything salient was omitted from the theoretical scheme.” (Strauss and Corbin 1998, p 159)

They suggest to compare the “emerged” theory with raw data. The theory should be able to explain most of the cases. Therefore, I did not destroy the audiotapes or transcripts to allow access to raw data and to compare the theory against the data. Another way is to ask the respondents to confirm the “fitness” of the theory to their case. Unfortunately, in this study, because of limited access to the participants (e.g. refusal to be interviewed again or our inability to locate them), I was not able to get participants confirmation on the fitness of our theory to their situation. Certainly an area of further study will be to interview parents whose children have been treated for extensive dental caries to validate and test our emerged theory.

## **CHAPTER IV**

### **FINDINGS**

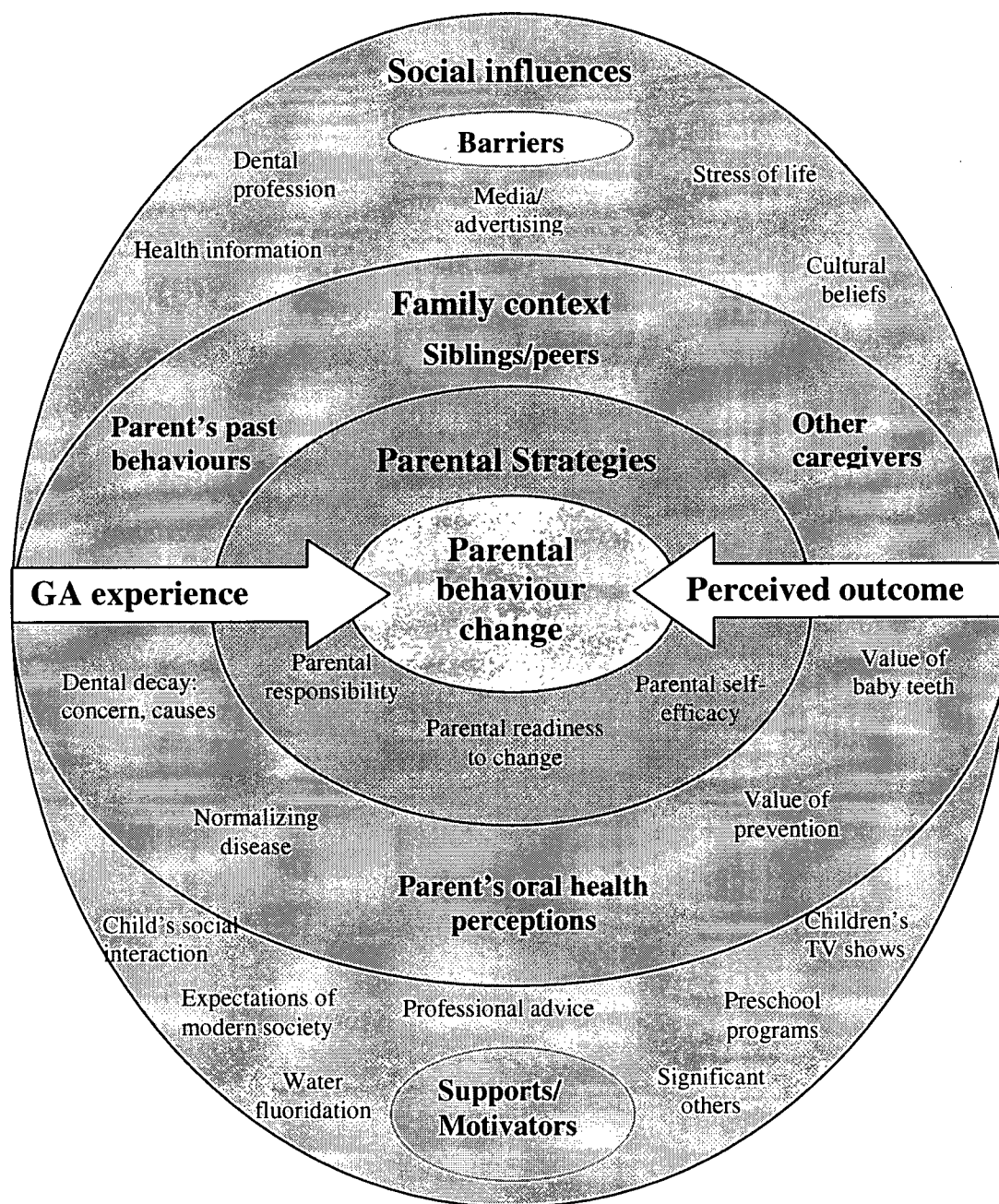
This study developed a conceptual model to describe parental behaviour change in regard to their child's oral health following the experience of a "dental GA." The model that emerged from the data collected is presented in **Figure 4.1**. The four theoretical categories that appeared to influence parent's adoption and maintenance of healthy behaviours were:

- 1) Social influences: including barriers and motivators or supports
- 2) Family context: including parent's perceptions and beliefs about oral health
- 3) General anesthesia: experience and outcomes
- 4) Parental strategies: including parenting skills and parenting styles

The model seems to tell us that parent's interaction with the family environment and the environment external to the family has a profound effect on the practices they employ in regard to their child's dental health. The center of the model, the focus of this study, is parental behaviour change. The three circles peripheral to the core consist of the categories that influenced change in parent's behaviours. The most peripheral circle includes those social influences that had either positive or negative effects on families, which in turn, influenced the strategies each parent used to adopt and maintain healthy behaviours for their child. The experience and perceived outcomes of the GA, which were initially expected to be "cues to action" for parents to change their behaviour, did not seem to have a long-lasting impact on parent's behaviours and, therefore, their child's dental health.

**Figure 4.1** A conceptual model of parental behaviour change following their child's dental general anesthesia.

Legend: Categories, e.g. **Social influences**  
 Subcategories, e.g. **Barriers**  
 Concepts, e.g. Media/ advertising



A presentation and discussion of each category of the model appears in the next sections of this chapter. I will use parents' quotes to both illustrate and "ground" the theory on the views and experiences of these participants.

#### **4.1 Social influences**

Social influences were situated as the most external category in the theoretical model of parental behaviour change. We define social influences as those social and economic conditions that influenced the oral health behaviours of parents and families. These "conditions" in turn affected the strategies parents adopted regarding their child's dental health, for example dietary habits. Being external to the other three categories did not suggest less importance, but meant that the components of this category greatly influenced the extent to which parents were able to use social resources to manage their child's oral health and cope with difficulties. Therefore, some of the social determinants that influenced parents' attitudes and behaviours about dental health in turn positively influenced adoption of a particular dental health action, and other determinants actually acted as barriers to good dental health. Therefore, I will present this category under these two sections, barriers and supports.

##### **4.1.1 Barriers**

###### **4.1.1.1 Cultural beliefs**

Parent's perceptions of health and their health practices are likely influenced by their cultural beliefs. The two issues our parents discussed that appeared to be profoundly influenced by culture were "food choices" and "reliance on professionals." Food choices are part of complex cultural traditions that contribute to ethnic identity. In our study, almost all parents regardless of cultural background were well-aware of the cariogenic

potential of sugary food and snacks. However, frequent sugar intake by the child was common across all ethnic backgrounds. A Chinese mother of two children doing her best to provide a healthy diet for her family admitted that:

*"I give them treats a little bit, you know, life is life and they need treats, but after full stomach or when they do something really good, I give them a little bit sugar for making them happy."*

And another Chinese mother similarly said:

*"I think it's impossible to ask the child not to eat any sweets. They will eat them until candies were no longer sold."*

Similarly, a Filipino mother described:

*"Sometimes you become tired of their complaints and you just buy whatever they want [laughing], it's because ... sometimes they just need a change. You yourself need sweets like dessert or something like that sometimes!"*

And from the words of an Eastern European mother:

*"... its still problematic with her grandparents; they are, um, very European that way, a child always has to have food in her mouth, so every time she walks by, they sort of lure her with treats, if I complain, they would say: "oh, but its just one donut!" and that kind of thing."*

Parents of all cultures admitted that sugary foods, though "bad" for the teeth, had an important place in the life of their child. However, most of our Chinese families talked about another food-related issue. They seemed to be overly concerned about their child's simply getting enough to eat and were, therefore, more permissive in their child's food choices. For example a 36-year old mother said:

*"If they want to eat or drink something ...it would be very hard to enforce these rules upon them just for the teeth. You can't just take care of the teeth and forget the needs of other body organ ... I don't think about my teeth when I eat."*

And in the words of another mother:

*".... her oral health is not one of the factors we consider in selecting food/drink."*

When I shared this finding with a Chinese dentist at Monarch, he confirmed that:

*" ..... just from my personal opinion, I think Chinese families are very conscious about eating healthy or (in their perception of eating, maybe healthy isn't the right word) eating enough so that their child is not skinny because there's this big thing in Chinese culture to always have a fat baby because fat means they're healthier so they're not giving them healthy food is a different matter but, yeah, eating is very important to their perception of overall health and asking them to change something just for their teeth, they still perceive it as not that important . I can't pinpoint to a particular culture but I think Chinese are probably less apt to change, the same as East Indian, they also seemed to be less apt to change, its hard to pinpoint specific cultures, I think its much more individual parents."*

I asked another Chinese dentist to comment on this finding and he was even more confident about the trustworthiness of this finding:

*Of course, it's a cultural thing, the old Chinese values; it's strictly a cultural thing. Food is very important. I give you another example: kids should not eat food before GA; they are all told about the importance of being fasting; then they come in and say: "I gave him a big bowl of congee" you say why? ... "because if they don't eat they will die"; I hear it all the time."*

A reliance on health professionals rather than on parental actions was a theme expressed primarily by the Chinese families. For example, a mother of a 3-year-old daughter explained:

*"I [for children] see dentists twice a year. I take them to the dentist ... the rest is the work of the dentist. I think the dentists are very important."*

In the words of another Chinese mother:

*"In an early stage you have to do something like visit a dentist or brush your teeth; that is the way you can prevent cavities."*

This finding is also shared with the same Chinese dentists and one of them said:

*"There are quite a few Chinese who are like that .... its kind of like, I mean it's a bad analogy but its almost like, well, you have high blood pressure so for most cultures its like "I'll make changes to lower my blood pressure" versus Chinese, I mean some of them will still do that but they're more apt to, well, "I'll just go to the doctor and he'll give me the medicine to fix the problem", so they're more, " it's the doctor's job to make sure I'm healthy not my own job to make sure I'm healthy." [Laughing] Yeah, that is a part of Asian culture, so I don't know if it's strictly Chinese or not but I do know about the Chinese people."*

It must be kept in mind, however, that in the multicultural communities where the patients in this practice live, individual cultural traditions are hard to separate because they get "mixed up and modified" by the surrounding cultures.



#### **4.1.1.2 Stress of life**

Most parents in this study reported that the stress of daily life made it difficult to care for their child's teeth. Some parents talked about unemployment as a source of their stress:

*"If I want to scale the stress level of my life from 1 to 10, I would say 10, because my husband has been out of work, so it's been very difficult."*

Others talked about the financial concerns of the family as the main source of their stress:

*"if you have a family, then you have to provide their financial needs, which could be the source of stress."*

However, rather than dwelling on "external" sources of stress like employment or economics most parents talked about "family issues" as the main source of their daily stress. I will discuss family-related stress in the family context category.

#### **4.1.1.3 Dental profession**

The process of finding a dentist to treat their young child was a challenge for many parents. For example, a mother of a 3 ½ year-old-boy complained that:

*"... every dentist that I tried to make an appointment for him, they said they cannot see him unless he is older than three. So as soon as he turned 3 years, I tried to get him into a dentist."*

Another mother, similarly, said:

*We took him to the dentist and they said may be he is too young, 3 years old, to do anything. They also said his teeth looked fine, but then he started complaining and we took him here."*

In addition to the challenge of finding a dentist, parents also mentioned the cost of dental care as a barrier to their own and their child's dental health. A Chinese mother explained:

*“When I have toothache, I’d try to put off seeing my dentist until I couldn’t bear the pain any more because we don’t have dental insurance. Financial factors determine how often we see our dentist. Back in Taiwan, we didn’t have to pay for dental treatments. Here in Vancouver, it’s very costly. Therefore, we’d rather go back to Taiwan for dental treatments, air fare is even less than the cost of a dental treatment.”*

A Polish father of a 2 ½-year-old daughter also described:

*“We were very surprised that her teeth were so bad, and first my thinking was, it [the cost of fixing the teeth] would be very very expensive. Her teeth got worse and worse and I was looking for some assistance and then I learned about this [government support] which helped us to look after her teeth.”*

Therefore, many parents did not consult a dentist at the currently recommended age for a child either because of a lack of dentists willing to treat young children and/or the cost of dentistry. For those parents who did take their toddler to a dentist, their dentist frequently postponed the treatment or the referral to a specialist practice until a more advanced stage of disease.

#### **4.1.1.4 Health information**

While the “information” given to parents by health professionals in the spirit of promoting oral health is done with good intentions, participants often felt challenged by the content of the health messages. Parents suggested that some preventive recommendations are “unrealistic” and too complicated:

*“It’s easier said than done. I know they shouldn’t eat candies, sweets, soft drinks if you want to prevent cavities. And, you should brush their teeth twice, once in the morning and once at night. But, in reality, is it possible to do everything recommended?”*

Similarly, another mother complained

*"Information about preventing cavities from the dentists should be helpful, but very few parents will put it into practice because they are still very troublesome. I have some knowledge, but it's still hard doing them myself."*

Some parents clearly placed no value on receiving a "lecture" from a dentist and asked for more practical help:

*"Well, I have an experience ... we talked to a dentist in Children's Hospital, the rate was \$100/hr. They gave us an one-hour long "lesson" about how to take care of our child's teeth. At the end, the only thing we got out from it was to chew gums. The things we got out from it could also be found in the newspaper and books, so why do we still have to take that one-hour lesson from the dentist?"*

In addition, all parents complained about the "conflicting information" they received from professionals about all manner of dental health issues, including the age for a child's first dental visit, fluoride treatment, snacking, and breast-feeding practices. For example, a mother of two boys complained:

*"He doesn't eat at all, the family doctor said leave little snacks around the house and let him to pick them up as he plays; he is gonna eat and he will be happy. I was doing that. I was putting food around, leave it on the table, putting it there, when he was watching TV. My doctor was saying whatever you feed your child is OK and my dentist now tell me that the nibbling is not good. If your child has to nibble it should be just fruit or vegetables and that is it. Now, I know it was bad."*

However, parents welcomed an external encouragement to motivate them to follow recommended oral health behaviours. They stressed that information alone is not

sufficient for action. In the frantic lives of parents of young children, reminders with prompts are needed for action to be taken. A mother of two boys suggested:

*"I knew about the first dental visit at one year old, but I put it behind my mind. They say that you should take your child to a dentist at one year, but nothing is implemented. I wish someone would call to remind me."*

Another mother who did not return for her son's 6-month follow-up justified her failure as:

*"... they were supposed to call me to make an appointment and they didn't call."*

Our participants seemed to be saying that the professions' "advice-giving" and often contradictory messages were setting parents up for failure.

#### **4.1.1.5 Media/advertising**

Another difficulty parents faced in providing good nutrition for their child was the effect of the media on their ability to make healthy choices. A mother of two children complained:

*"I try to avoid the sugary stuff, like cereals, and to feed them more porridge, but they see them advertised on TV and there is a prize in there. I think that should be stopped."*

A father of a 3 -year-old girl also criticized the media:

*"In the market, kids are specially targeted for not only sweets, let's say all junk food."*

The availability and appeal of "sugary stuff" to children in the market place were difficult for well-meaning parents to resist.

## 4.1.2 Supports/Motivators

### 4.1.2.1 Professional advice

Even though, as previously described, the dental professionals were criticized by some parents for hindering good child oral health, other parents praised dental professionals. However, what parents most valued was not transmission of information, but when professionals shared practical “tips” or gave actual demonstration of self-care techniques. A 29 year old mother of two boys explained:

*I was having difficulty flossing because I used to make them stand; the doctor advised to lie them on the floor and then do it, it's much easier.*

Similarly, another mother also acknowledged:

*“She [the dentist] put him in her lap and she showed me how to brush his teeth, the right way to brush a child's teeth. I thought my brushing technique was good, yes I did! But I guess, it's better now with this one [the youngest child] after I learned. She showed me how to lie him down in my lap and hold him tight and brush. It worked. He still cries, but who cares.”*

However, parents were more ambivalent about the value of printed information, i.e. pamphlets. One positive mother said:

*“The information provided in dental offices is definitely useful. If we know how to do it then we'll try; otherwise, we won't know how, like brushing teeth, using floss, and mouth rinse.”*

However, another mother complained:

*“They give you pamphlet, but you have a new baby and you have problems with your milk not coming out or you're pumping ... and you hardly have time to read that.”*

Therefore, parents seemed to be requesting a supportive and brief counselling approach rather than the standard “lecture” or advice from professionals which most parents found to be both “complicated” and “unrealistic.” In other words, parents emphasized that the transmission of information is not sufficient to promote improvement of oral health behaviours in relation to their child.

#### **4.1.2.2 Our community**

It was interesting to note that only the parents whose children were “cavity-free” at the recall exam (the “no-relapse” parents) talked about the support they received from the wider community. They talked about children’s TV shows and brushing and snack-time programs at preschools. Our “relapse” group of parents made no comments at all about community supports. Some comments from the positive “no-relapse” group include:

*“She was watching Barney show the other day and they were showing how to brush.”*

*“Going to preschool has made a big difference to her because they bring their toothbrushes to school and they brush their teeth after lunch and she sees that other kids brush their teeth.”*

*“He only wants candies when we go out; before, he used to want them at home too. The teachers at preschool have educated them.”*

Some parent’s also mentioned books, newspapers or even the Internet as community supports that give them the required information. The community assistance that the “no-relapse” parents asked for were educational videos, pamphlets with pictures, public

awareness programs and government assistance for dental visits. The “relapse” group only asked for “free dental check-ups.”

Suggestions for how the “community” can provide assistance to families varied between our groups of parents. However, often parents talked about community in a slightly different sense mentioning the expectation and judgment of society on “how well people care for their body.”

*“... people in, like, my grandparent’s generation who never really brushed their teeth and used toothpicks or something and many of them kept all their teeth for the whole life, but I think given how conscientious modern society is now about your teeth and your smile, you just need to brush more often and go to the dentist more often because you’re judged on how well you care for your body and [healthy] teeth is a big sign of being healthy and caring for yourself.”*

As a further comment on expectations of community and society, many parents expressed concern about their child’s appearance and her/his social interactions. A father of a 3-year-old daughter explained:

*“I want her to have healthy dental system and beautiful teeth, especially when she is a girl”*

Another mother said:

*“... baby teeth are important and we need to take care of them because of their [child’s] appearance, a lot of people see them, if they don’t look nice, the kids get teased and bugged.”*

She also seemed concerned about the judgment of society about her parenting as she remarked:

*"I am personally embarrassed by my child because her teeth were so bad before, and she's got no teeth now; I am embarrassed because I wasn't there to prevent that."*

While parents acknowledged that society values a healthy smile and beautiful teeth, their own children now had many restorations and in most cases, had teeth extracted. However, their realization of the importance of a "healthy dental system" may help move these parents further along the process of positive behavioural change.

#### **4.1.2.3 Significant others**

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 grandparents, babysitter, friends, and families or "people" in general. For example, a 45 year-old mother of a 6-year-old daughter remarked:

*"After we found that she has quite a few problems, we went to my husband's friend's house and he said that his brother had much worse teeth than my daughter has; they fell off and he's fine now; don't worry! People tend to give you that kind of advice to think that there is no reason to be worried."*

And a 34-year old mother of three children all of whom had GA dental treatment said:

*"There are a lot of parents who don't really care about their children's teeth; I myself have a lot of friends that they are careless about taking care of their kids' teeth."*

And then she added:

*"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 was noteworthy as it suggested that some parents are not open to unsolicited “advice” from anyone. However, most families in both groups strongly believed that:

*“Parents are more receptive to the information exchanged between them because they have gone through the same experience.”*

While parents admitted that many of their friends, who are also parents, may have misconceptions about children’s teeth, they suggested “parents-talking-to-parents” as a recommended way of communicating healthy behaviours.

#### **4.1.3 Social influences: theoretical propositions**

The theoretical propositions that emerged from this category are:

- 1) Our Chinese families seemed to be more permissive about their child’s food choices and more reliant on professionals rather than their own actions.
- 2) Cultural beliefs, actions of dental professionals, and media/advertising may hinder parent’s endeavors to adopt dentally-healthy optimal behaviours for their child.
- 3) Some parents are more receptive to social supports than others; regardless, the “judgment of society” is an important motivator for many parents.
- 4) Parents talking to parents may be an effective approach to counselling parents of young children.

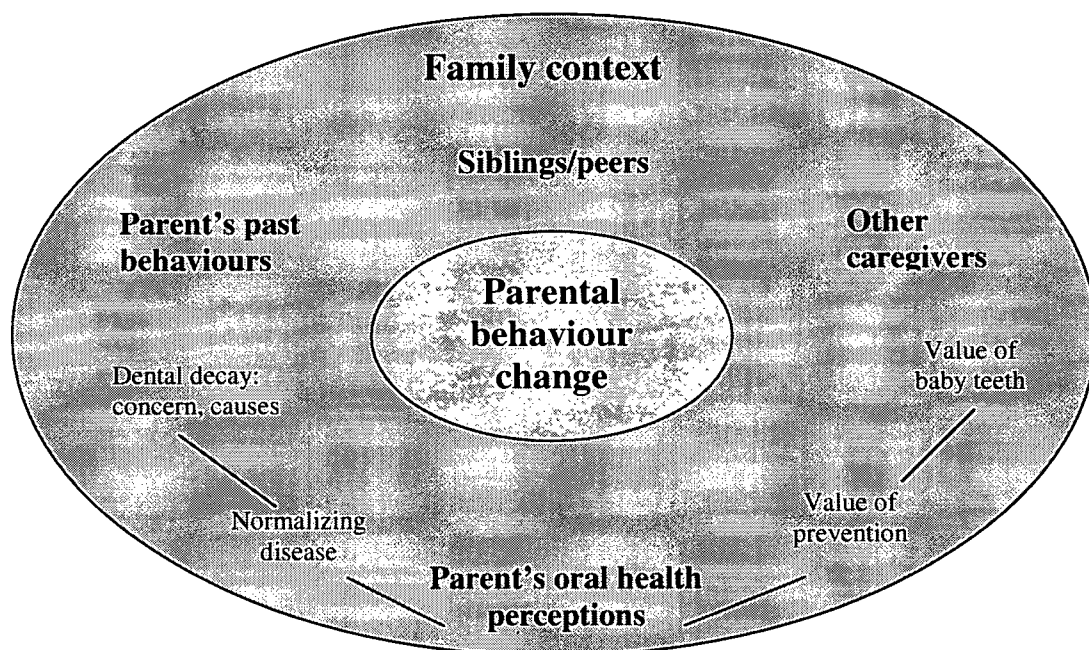
#### **4.2 Family context**

This category consists of concepts related to all members of the family including the parents, other children, and other caregivers like grandparents or babysitters (**Figure 4.2**).

Parent’s own beliefs, attitudes, and behaviours play a key role in the health of their family; therefore, I start this section by presenting parents’ general concepts about oral health and their specific thoughts on baby teeth. Next, I explain parent’s past behaviours regarding

their child's oral health. The section ends with the impact of other family members on child's oral health. Together these three sets of concepts situated child oral health within the context of their family.

**Figure 4.2** The category of Family Context



#### **4.2.1 Parent's perceptions of oral health**

##### **4.2.1.1 Dental decay: concern and causes**

Parents' different concepts of oral health will affect the health behaviours that they initiate for their child. The general concept of oral health shared by our group of parents was "not having any pain or discomfort." Our group of parents appeared to have an "absence of

disease" approach to both their own oral health and their children's oral health. When asked: "How do you describe a healthy mouth?" a Chinese father replied:

*"When there is no pain or discomfort, then I'll consider my teeth healthy."*

And a Chinese mother similarly commented on her son's teeth:

*"As long as his teeth are not painful they are fine and I consider them as healthy."*

It also appeared that their concerns were limited to "cavities" rather than a more holistic view of oral health in general, as exemplified by a 29-year old mother who described a healthy mouth as:

*"That's no cavities at all."*

However, given the fact that their child had just had a GA for treatment of cavities this pre-occupation with pain and cavities was not unexpected.

When I explored parent's understandings of the causes of dental decay (cavities) in children, they related tooth decay to factors like inappropriate breast- or bottle-feeding, sugary foods, inadequate oral hygiene, general health, genetics, and lack of access to fluoridated water. In the words of a Caucasian mother of three children all of whom had GA dental treatment:

*"From breast-feeding so much, even though we brushed, I guess we were not brushing as best as we should have been, and from eating things that they shouldn't eat like candies, pop ..."*

In the words of an Indo-Canadian mother:

*"I guess it's because of the bottle and the way that children eat and brushing the teeth. I really believe that the main factor was me giving him milk in a bottle at night and cookies that he ate through the day."*

And another Indo-Canadian mother:

*"... I think too many candies and also leaving the bottle in the mouth at night, because the milk turns to sugar; that's why she got [tooth] problems."*

And an Eastern European mother:

*"... deep grooves, poor dental care and not enough brushing were the reasons she got cavities in the first place."*

Some parents generally linked tooth decay to hereditary factors:

*"I think we have to blame genetics, some people are born with strong teeth and some not."*

And some parents linked healthy teeth with the general health:

*"Sometimes, one's oral health is also related to one's general health. So, if there's a problem with your general health, it's hard to stay cavity free, even after utilizing all possible methods."*

And some others talked about fluoridated water and its role in reducing dental decay. For example, a Chinese mother said:

*"...I didn't, I didn't expect my son having so many cavities and both of my kids had a big, I mean, serious problem when they were three or something like that, yeah, it really, it really scared me and I think one of the reason is, I don't really trust the water in Canada, it doesn't have the [pause] fluoride because not many children in Hong Kong have very bad teeth, so, I don't know maybe it's because of the water, all I can say maybe the water is a problem, yeah."*

Another Chinese mother also clearly said:

*"I do believe fluoride in the water is good for kids' teeth."*

Interestingly, only the Chinese families talked about bacteria as a major risk factor for dental decay. A Chinese mother explained the causes of dental decay as:

*"Before I had my children, I never considered baby teeth of any importance. In China, when I was still a child, we didn't see dentists but my teeth are still fine...no need for filling, restoration, etc. After moving here, my children probably ate a lot of candies. Therefore, although they were born with nice teeth, they have to face the daily attacks by bacteria and the delicious sweets and soft drinks. Since being a mother, I have been pretty concerned about my children's teeth because their teeth aren't quite the same as other body parts. You can't see their teeth unless they open their mouths. I pay attention to my children's as well as to other children's teeth. I noticed that childhood caries seem to be quite prevalent; therefore, I think it's related to one's diet."*

And another Chinese mother similarly remarked:

*"The pain is a result of poor oral hygiene and of bacteria damaging the tooth structure."*

A Chinese father also said:

*"No matter how clean your teeth are bacteria still exist."*

And in the words of a Chinese mother:

*"... brushing can reduce the amount of bacteria. I also let him use mouth rinse ..."*

When I shared this finding with our Chinese dentists, one of them clarified:

*"Well, it may be the culture because in general a lot of Chinese families whether they're from here or from Hong Kong or from China, for most diseases or any sickness, they just automatically know its because of bacteria, so when they have a cavity, to them its not different than when they have a cold or some other kind of infections. They automatically link it to bacteria so its almost a natural assumption for them, whether or not was actually*

*talked. We talk about bacteria the same to everybody but I noticed in the Asian culture that a lot of illnesses they will contribute to bacteria because in general they're very aware of, of dirty things and it may be the language too because the word they use for bacteria is a little bit more broad based."*

Almost all parents had a reasonable understanding of the commonly-understood causes of dental caries. They acknowledged the causes over which they had some "control" e.g. sugary food, tooth brushing, but also pointed out causes beyond their control e.g. genetics, fluoridated water, and general health. Our Chinese parents talked about bacteria in plaque: some indicated bacteria could be reduced by better toothbrushing but others did not believe bacteria could be controlled. Most parents admitted the gaps in their knowledge before the GA, but felt more knowledgeable as a result of the information acquired during the GA experience.

#### **4.2.1.2 Normalising disease**

Almost all parents seemed to somehow normalize the presence of "cavities," saying they were a common occurrence. An Indo-Canadian mother said:

*"I think having a cavity is OK, because I don't think there is anybody out there without a cavity... even if it is preventable, but it happens."*

A Chinese mother also said:

*"Having cavity is not normal but it is acceptable because it's so common. Since we eat so much, it "seems" to be problematic...So, need to see a dentist in time. If treated in time, it's fine. Although there's a problem, it is the kind of problems that I can accept because it's so common."*

Another Chinese mother similarly remarked:

*"Having cavity is normal because it is very easy to get cavities; the chance of getting cavities is much higher when we have so many teeth. If there were only 1 or 2 teeth, then it would be different. Therefore, I think it's very hard not to get any cavities. Have you seen anyone without any cavities?"*

And a similar quote from a Filipino mother:

*"I think having cavity is normal, as long as there aren't a lot of cavities. It's impossible to not have cavities for life."*

Therefore, although some parents seemed to be certain that dental decay was "normal" and others clearly said "dental decay was not normal," all parents expressed more or less the same point of view that "dental decay is inevitable and just part of life."

#### **4.2.1.3 Value of prevention**

It was not surprising that our parents expressed doubt about the effectiveness of prevention given their feeling that dental decay was "inevitable." 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, but if I had done better then my son might have less cavities."*

A 53-year-old father of a 3-year-old girl also expressed ambivalence about the value of preventive behaviours like toothbrushing:

*"...cleaning the teeth may help to save them, but genetics is also an important factor."*

And a Chinese father said:

*"... information on prevention won't work for me because it is hard to keep it up."*

Similarly, another Chinese mother remarked strongly:

*"It's hard to say having cavity is abnormal. You won't necessary get cavities even if you don't brush your teeth. One's genetic makeup is a very important factor. Take my son, for an example, he brushes everyday, but he still gets cavities. The dentist said it's probably due to different genetics ... or my youngest son doesn't like candies, but he still has lots of cavities. I'm really confused...My dentist couldn't really explain this either. My oldest son drank milk [with bottle] when he was young, just like my youngest son, and he ate more sweets, but he didn't have the same problems as my youngest. I am not sure if we can prevent cavities. My husband brushes my son's teeth very well, but my son still got lots of caries. He also rinses his mouth after drinking milk."*

This ambivalent and uncertain attitude about the benefits of preventive practices may impede parents' engagement in preventive actions and will certainly discourage their persistence with new behaviours.

#### **4.2.1.4 Value of baby teeth**

All parents agreed that baby teeth are important for a child's eating, speaking, and appearance:

*"They [baby teeth] fall out later, when they are around 6 years old, but they are needed for eating and for speech, so we need to brush the teeth and watch what we feed them [children], make sure they [teeth] are clean before they [children] go to sleep."*

Only some parents, mostly those in the "no-relapse" group, acknowledged a relationship between healthy baby teeth and healthy adult teeth:

*"I know baby teeth are very important; if they get "rot" they would destroy the second set; it's also related to their digestion and nutrition."*



The comment of a 34-year old mother of three children, all of whom had had dental treatment under GA, suggested that to her the importance of primary teeth was related mostly to their aesthetic value rather than function or healthy development:

*"Because of their appearance, a lot of people see them. If they don't look nice, the kids get teased and bugged."*

Some parents initially said baby teeth are not as important as adult teeth, but after further reflection, they changed their mind:

*"Baby teeth are less important than adult teeth, because you have to lose them anyway, But until then I guess, having them is very important because kids would have problem with chewing, so, yes, they are very important ... if baby teeth get cavities then adult teeth get cavities later, so if you don't look after the baby teeth properly, they get more cavities in their adult teeth, in that case, I would say both are important."*

In contrast, other parents who started with a strongly positive attitude towards the importance of baby teeth ended up saying:

*"...anyway, they're not permanent so why bother; when the permanent teeth are coming out then we should be careful."*

While all parents suggested that baby teeth are more prone to dental decay than adult teeth, their explanations for this belief varied. Our "no-relapse" parents suggested the difficulty of looking after young children's teeth was a likely reason. This belief was stated as a fact of life:

*"I guess it's because of the bottle and the way that children eat and brush the teeth; like I had a hard time with him; brushing his teeth, it gets very difficult; so I don't think that I'm*

*cleaning it as much as an adult could clean the teeth all the around; so I think it's easier for a little child to get cavity than an adult."*

*"Baby teeth are more prone to dental decay. They don't understand, they don't know how to maintain their teeth."*

Another parent just felt cavities develop faster in baby teeth:

*"It's much easier to get cavities in baby teeth because it only takes a short time for the cavities to form. For example, my daughter's teeth were very nice not long ago, but perhaps because of having some food before nap time and not liking brushing her teeth her teeth are now in very bad shape."*

In contrast some of the "relapse" parents seemed to almost be blaming their child for tooth decay:

*"Baby teeth most likely get cavities than adult teeth because kids are usually lazy, they don't brush their teeth without their parents' reminders."*

*"Baby teeth get more cavities than adult teeth because kids are careless they eat a lot of sweets and they don't brush properly."*

Whatever their understandings of the susceptibility of baby teeth to cavities, many parents were "very surprised with their child having so many cavities at such a young age." While parents were unhappy about their child having a cavity at all, having a tooth extracted because of extensive tooth decay was a problem of much greater magnitude. A single mother with two children explained her feelings about her son's tooth loss:

*“A cavity here and there is okay, but like, five teeth pulled out, it was just ridiculous; it hurt him, and it’s more or less my fault.”*

Another mother similarly blamed herself for her child’s tooth loss:

*“I feel bad, because I feel that I’ve done something wrong that his tooth has to go ...”*

The beliefs and understandings about “baby teeth” in our group of parents were quite variable. However, for different reasons, they acknowledged that baby teeth were more prone to dental decay and admitted that dental decay resulting in tooth loss was not acceptable.

#### **4.2.2 Parent’s past behaviours regarding their child’s dental health**

Dental caries is a complex disease, but parent’s home care practices and use of professional services will have a major impact on their child’s dental health. Parent’s previous practices regarding their child’s dental health were explored around the three themes:

- 1) Feeding practices
- 2) Oral hygiene
- 3) First dental visit

##### **4.2.2.1 Feeding practices**

Most parents in this study talked about the detrimental effect of breast- or bottle-feeding habits on their child’s dental health. They correctly identified the relationship between sugary liquids in the bottle and tooth decay. Nevertheless, parents commonly reported their child was breast- or bottle-fed beyond 18 months of age. They justified their child’s dependency on the breast or bottle as a reflection of the child’s need for “security.” The

comments of a 34-year-old mother of three children, all of whom had dental treatment under GA, about breast-feeding were:

*"I guess that was from the breast-feeding; she was breast-fed for about three years; they become very attached to it, just like a security. I didn't try to break them away; I find it very hard to say no to my children with nursing stuff."*

Although this mother realized breast milk was no longer needed for nourishment, there was still hesitation to curtail breast feeding. Another single mother of 3 ½ -year-old boy blamed the absence of his father for her child's bottle-feeding habits:

*"His dad [was] not being around, so the bottle was his security, I wish he had anything else for his security; I wish he had a blanket ..., but that [the bottle] was his security."*

At the same time, she also talked about her desperation and, therefore, failure in weaning:

*"...the doctor told me cut him off year ago, but I couldn't because my life would just be hell."*

For this mother, the bottle seemed to be an immediate solution for her child's or her own frustrations. She also seemed to place the responsibility on her 3½ -year-old son with the comment:

*"She [the doctor] told him; she even showed him some pictures. We also explained to him [why he got bad teeth]; I took him to the doctor so many times and explained to him why ... and now (after the surgery) he realizes why ... we tried everything, but it [bottle] was just his security."*

One father also suggested:

*“... after the first appointment, we had to get rid of the bottle. It was hard in the first few nights; we had to comfort her a lot; even though she was addicted to her bottle, it happened and now she is OK; she only drinks from a cup.”*

This tendency to “blame” the child for dentally-unhealthy habits was also expressed by other “relapse” parents in relation to toothbrushing (4.2.1.4).

On the other hand, a mother who successfully weaned her child from a bottle misunderstood the rationale for doing so, as she described:

*“After I stopped the bottle, I was still giving him milk in a cup before he went to bed, in the middle of night if he wanted it, and in the morning. I thought because it's not in the bottle, it would be fine. I was wrong and it was the same as bottle.”*

Nonetheless, there were other parents who simply took action and successfully weaned their child:

*“I did not know about baby bottle teeth or anything like that, but after the first appointment, we got rid of the bottle right away.”*

In addition, children's frequent intake of sugary food was commonly reported by the parents. Some parents admitted using sweets to pacify or reward their child. For example a Filipino mother explained:

*“When we go to the church, we have to take them with us because we don't have a babysitter to leave them at home; so we have to give them a treat like some candies to behave properly.”*

A young mother of two boys justified giving sweets to her children as:

*“If they asked for a treat, I just gave it to them, because I was thinking if they brush their teeth, it should be fine.”*

Some parents also seemed to think that they should indulge their child's food preferences or their child would be malnourished.

*"They have to drink something; they don't like pure water because it doesn't have any taste. Another thing is milk, but milk is part of our food; so there is not much we can do; they don't want to drink unless you pour a little sugar in it."*

A 44-year old mother of 2 children first talked about how harmful sugary food is for the teeth, but she also justified her daughter's frequent sugar intake by saying:

*"She is a 'picky eater.' I cannot force her to eat healthy food and she needs something to give her energy any way."*

Overall, controlling a child's eating and drinking habits was reported to be a common parenting "battle" with respect to not only the dental, but also the general health of a child.

#### **4.2.2.2 Oral hygiene practices**

Parents repeatedly expressed their difficulties in brushing their child's teeth properly. A mother of a 3-year-old boy admitted:

*"I brushed up for him until two, and then he started brushing his teeth, I gave him the opportunity to brush his teeth, and he wasn't doing it properly; that's how bad his teeth got."*

While the importance of parental supervision was acknowledged, most parents admitted it was a struggle to brush their young child's teeth:

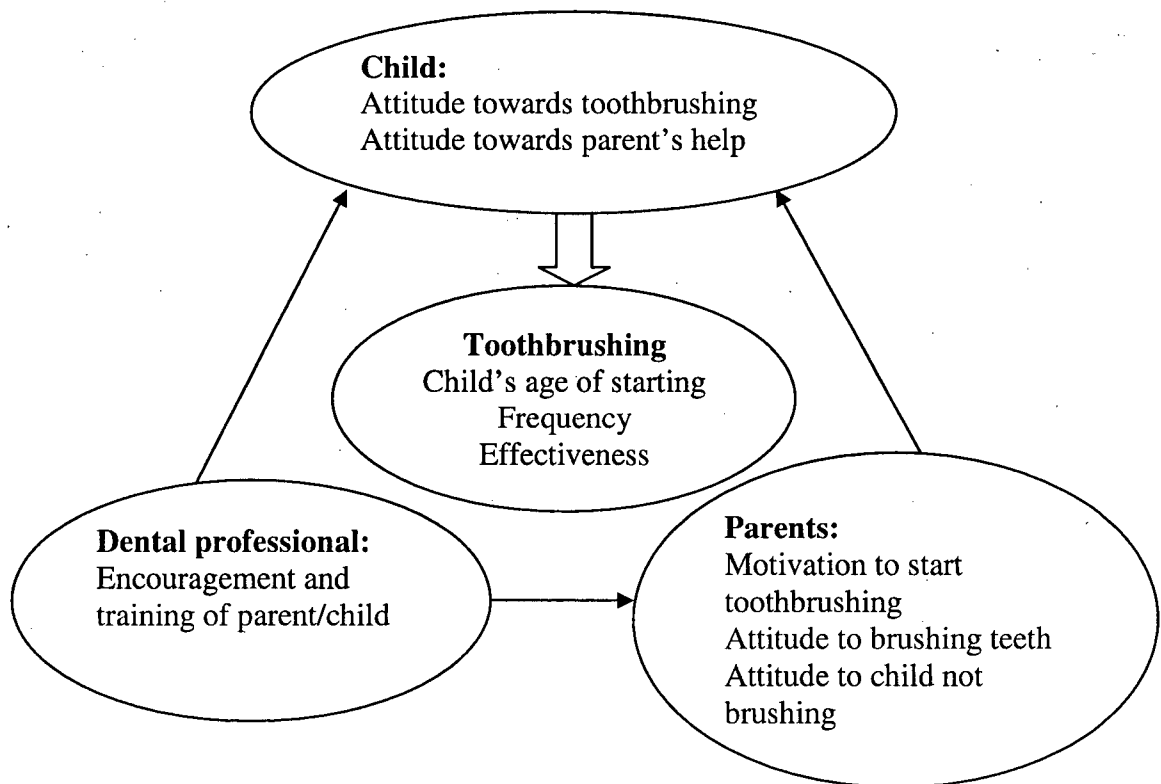
*"It's very hard with my daughter to actually sit down and take long enough to brush as well as we are supposed to; she is a very tough little girl."*

Although almost all parents started to brush their child's teeth before two years of age; however, it seemed most children were left to clean their own teeth by the time a child was around four years of age because of the child's continued resistance:

*"I brushed his teeth until four, he wants to be independent now; he doesn't let me to brush his teeth any more. I think he can do it. He is six now, it not like a three years old."*

Factors related to establishing regular toothbrushing habits identified by our parents are summarized in **Figure 4.3**.

**Figure 4.3** Factors related to establishing an appropriate toothbrushing habit



Although parents had good intentions to properly brush their child's teeth and knew the value of toothbrushing, a child's resistance was mentioned as the main obstacle for parents to establishing regular toothbrushing habits. They acknowledged, with some regret, that similar to the "eating and drink" battle, the struggle over toothbrushing often saw the parent on the losing side.

#### **4.2.2.3 First dental visit**

All referrals to this specialty practice by general dentists were because of the child's extensive dental decay and behaviour management issues. Many of the children had pain and abscess formation at the time of referral. Given that dental caries is a disease "process" that, at an early stage, can be reversed we wondered why treatment occurred at such an advanced stage of disease. When queried about the recommended age for a child's first dental visit, some parents were not aware of the importance of this dental visit:

*"It just never crossed our minds; no one ever talked about it and it never came up in any classes. There is, in some books, about age 3 years that a child should get to see a dentist, but the damage had already been done."*

Other parents' attempts to take their child to a dentist had failed for a variety of reasons:

a) Other caregiver's misunderstandings about baby teeth:

*"My husband adamantly thought that the baby teeth fall out, so the delay was there ..."*

b) Child's behaviour:

*"We tried to take him at the age 1-year old; we took him to the health unit; he was crying and we couldn't get him through that door, and then the nurse said that it's better to take him back and then bring him when he is more comfortable."*

c) Availability of dental care:



*"... every dentist that I tried to make an appointment for him, they said they cannot see him unless he is older than three. So as soon as he turned 3 years, I tried to get him into a dentist."*

d) Cost:

*"First my thinking was, it would be very very expensive."*

As a result, many parents were not able to consult a dentist at the recommended age for their child and the first visit did not occur until a more advanced stage of disease. At this late stage, the extent of disease necessitated treatment under general anesthesia.

#### **4.2.3 Sibling/peers**

While parents have an undeniable impact on their child's daily life, a child's siblings and peer group were acknowledged by our parents as having an influence within the context of the family. Parents talked about the impact of siblings or other children. For example a Filipino mother of two girls explained:

*"She has an older sister, so she always follows her sister; like, if her sister doesn't eat vegetable, she doesn't want to eat vegetable too; or if her sister wants to eat candy, she wants to eat candy too."*

Similarly, another mother talked about her child's interactions with other children as a barrier to maintain healthy eating habits:

*"It is even more difficult when another child drinks apple juice in front of my son."*

However, parents also talked about the positive effect that other children had on their child's dental health behaviours. For example, one mother said:

*"... she also had her first sleepover at her friend's house and she was very happy that her friend had the same kind of toothpaste as she had, like, she talked about that afterwards and it has like sparkles in it or something, um, that's helped."*

Other young relatives were acknowledged by another mother as positive role models:

*"We have two more children now; my niece and nephew are with us so we are sort of a bigger family. Um, the bigger kids are actually helpful with Kaja because she learns from them, like, when they brush ..."*

Therefore, the behaviours of older siblings, cousins, and friends may affect young children in both positive and negative ways. Modeling the healthy behaviours of an older sibling or similar relative may enable young children to develop healthy habits.

#### **4.2.4 Other caregivers**

The misunderstanding of other caregivers within the family, primarily in relation to dietary practices, was also mentioned. A mother of 3 children explained:

*"I wasn't around a lot, like I was at work all the time, so whoever's watching her, gave her basically what she wanted, so that is a lot of problem; just shut her up, you know just to make her be quiet!"*

Another 44-year old mother also described:

*"We had enough information, but it was lack of understanding from my husband's family. They are not as careful. For example, she used to sleep over at my mother-in-law's house. She gave her the bottle at night and she would leave it inside her mouth, but when she was with me, she wouldn't have that. She asked for it but I didn't give it to her. I gave her water in the bottle and she could go around with the bottle, but not for a long time."*

Similarly, a 33-year old mother of an only child commented:

*"She is the only grandchild, the grandparents still are, um, they still don't think there's anything wrong with, with the treats that she's getting like the amount of treats, um, the candy and the chocolate and all that stuff, the cake isn't that big of a deal, what really concerns me is the amount of sugar they put in her tea and in her, they'll put sugar in her milk and sugar in her juice and sugar in her tea and its, its really sweet. Um, so its causes quite a bit of conflict ... she gets a chocolate bar bigger than her head, like daily, controlling that is our biggest challenge."*

Therefore, even for those parents who had enough knowledge and motivation to "do the right thing," the well-meaning, but "dentally-unhealthy" practices of other caregivers resulted in the establishment of habits that negatively affected their child's dental health.

In summary, all parents had a reasonable understanding of the main causes of cavities in children. They valued baby teeth differently, but perceived "baby" teeth to be more susceptible to dental decay than adult teeth. They also seemed to be uncertain about the value of prevention. As a result, almost all parents perceived dental decay as "inevitable." This belief can discourage some parents from engaging in preventive activities. Parents described similar challenges regarding their child's home care in the past, which impeded their effort to apply new healthy behaviours. The behaviours of other members of the family affected young children in both positive and negative ways.

#### **4.2.5 Family context: theoretical propositions**

- 1) The less parents feel they have control over the causes of dental decay (e.g. genetics, fluoridated water), the less likely they feel they can prevent it.
- 2) The more parents blame their child for "cavities," the less likely they will take further action to prevent it.

- 3) The less parents value baby teeth, the less likely they are to adopt preventive behaviours.
- 4) The bigger the “battle” a parent has in managing their child’s feeding and brushing habits, the less likely they are to maintain preventive behaviours.
- 5) The more “positive” the role models of siblings and other family members, the more likely a child is to cooperate with preventive practices.

### **4.3 General anaesthesia**

The “GA experience” was defined as the set of events which were more than just the treatment appointment under GA. It was the “total” experience of referral, the consultation appointment, the “GA appointment” and the parent’s, child’s, and even other family members’ reaction to these events that collectively comprised the “GA experience.” The GA category was intentionally represented differently in the model because general anesthesia did not appear to have the same long-lasting association with parent’s behaviour change as the other three categories. In addition, the “GA experience” was really an experience of the family and child. For our families “social influences” did not interact either positively or negative with the GA experience.

I present this category under two headings: the experience of the GA itself and the parents’ perceived outcome (**Figure 4.4**).

#### **4.3.1 Experience**

All referrals to this specialty practice by general dentists were because of the child’s behaviour management issues and need for extensive dental rehabilitation which included extraction of teeth and restorative dentistry. When parents first found about the need for a

GA, most parents responded with emotion (fear, worry, concern). In the words of a Chinese mother:

*“When I was told that my son needed a GA for dental treatment, it was like a bolt from the blue. I don't want to think back to that painful experience. When I first heard about the need for GA, I was very unhappy. It was painful and scary. We are against GA, and we prefer not using GA if that's possible. I don't like GA surgeries at all.”*

Parents also described similar feelings during the time that their child was in the “operating room”:

*“I was scared, but I had to trust someone. I knew there wasn't anything that I can do for my daughter, but if I could stay by her side I would feel much better.”*

Mothers seemed to report greater levels of anxiety compared to the fathers who were interviewed. A 33-year old mother of an only child described her feelings about the GA:

*“I've never known kids had surgery for teeth; I really panicked, felt like a moron, for bringing a child at this age through surgery because of neglect of the teeth.”*

While a father of an only 3-year old daughter said:

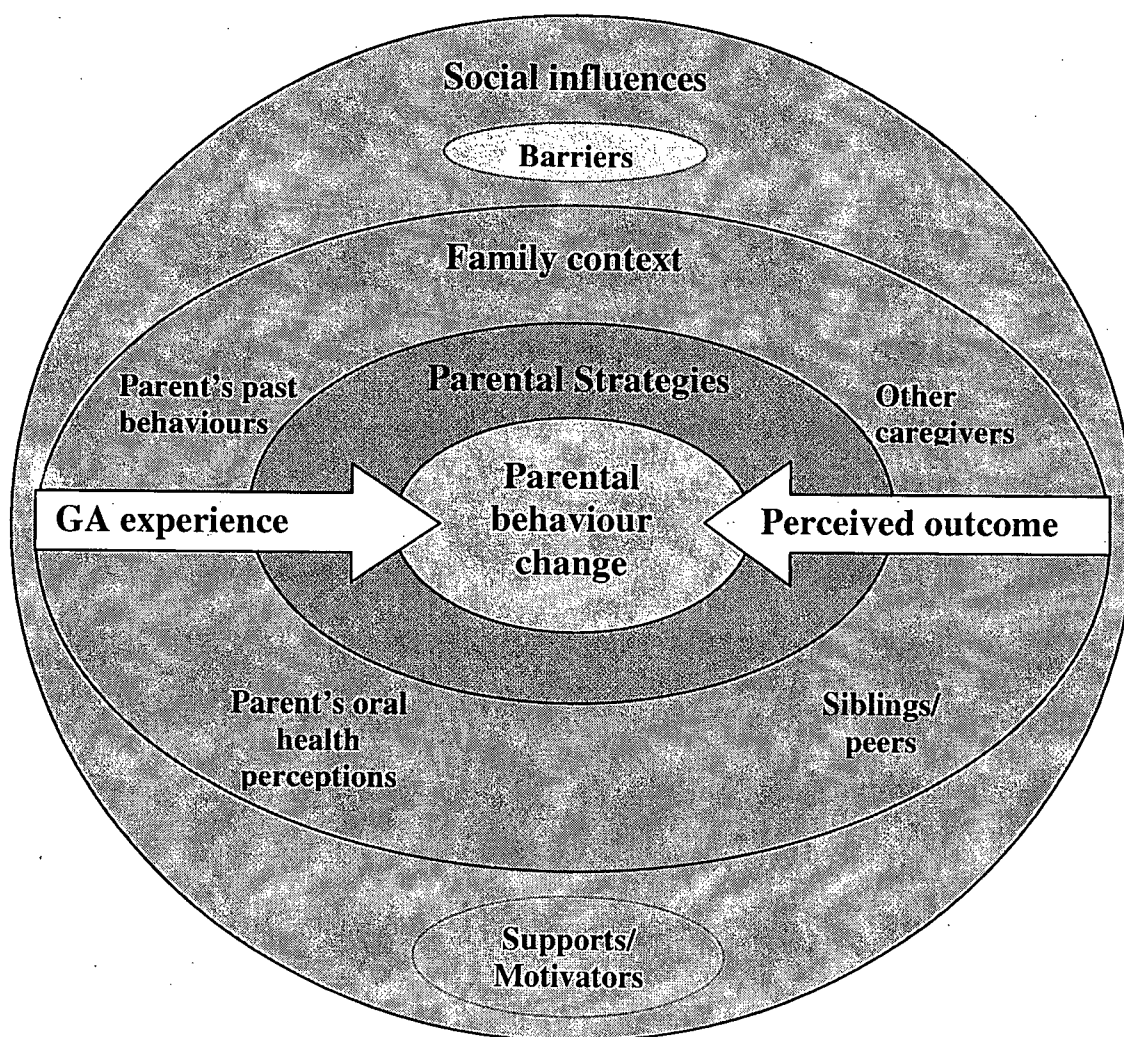
*“I felt just normal because I knew this is the way it should be. She is very young.”*

As demonstrated in the above quotes, some parents blamed themselves for their child's need for dental GA and described their feeling as “guilt”, others felt “blameless” and were convinced that a GA procedure was the only way to treat a young child.

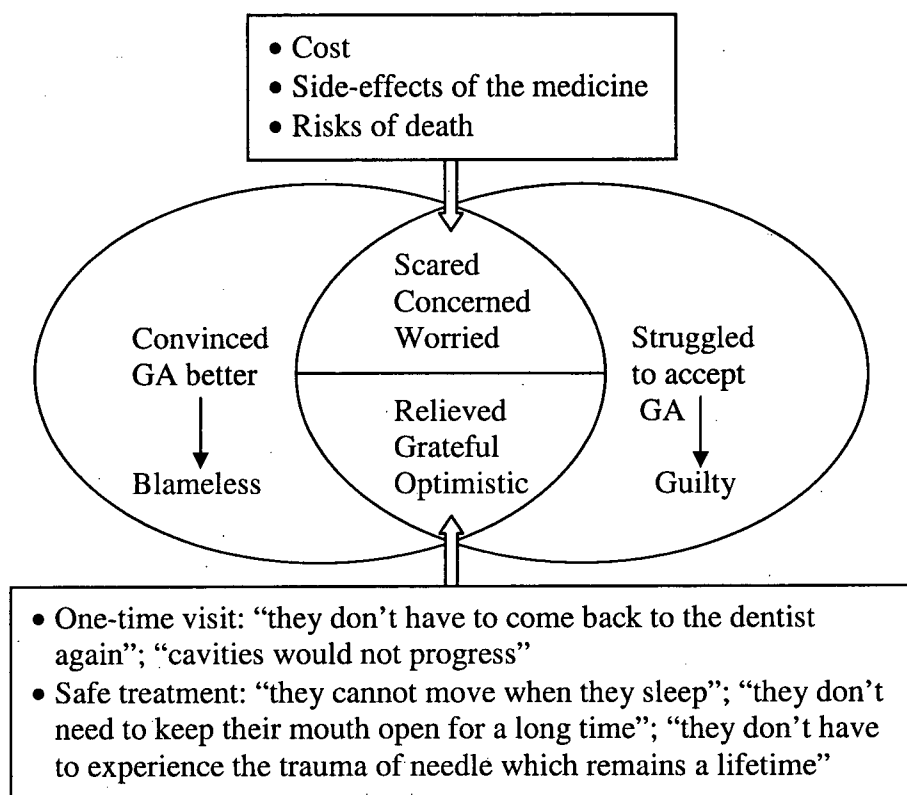
Nonetheless, emotions like “fear” and “worry” were common to all parents (**Figure 4.5**).

*“I knew it was safe and better than taking them in and doing everything when they are awake, but I was scared because he was my son.”*

**Figure 4.4** The category of general anesthesia in the parental behaviour model



**Figure 4.5** Parents experience of their child's GA dental treatment



The child going to sleep “so fast” was described as a particularly negative part of the experience. A mother of the three children said:

*“I don’t mind them going under GA, but the things that scare me the most is they go to sleep so fast, like they die!”*

Another mother also expressed the sense that watching her child be anesthetized was like watching her child die:

*“They asked me to hold him and suddenly he dropped off my shoulder; I am telling you no mother wants to see that, and then like he died ...”*

A Chinese mother described her sadness and even disbelief that her child could go to sleep so quickly:

*"I was very sad specially when seeing her falling asleep in just a few seconds...I think every mother would cry in that situation."*

Parents appeared to be aware of the complications of GA and most considered it a serious procedure with known risks. In the words of a 44-year old mother of a 2½-year old:

*"I was scared. I was thinking what if he wouldn't wake up, and when he wakes up, what if something is wrong with his brain."*

Experiencing a previous GA with other siblings did not seem to reduce parents' emotions:

*"I had similar experience for my daughter, for her tear ducts, they put her to sleep and did the surgery, I knew but still I was worried because he was a different child in a different situation, really worried about what would happened."*

Even the mother whose two other children had a dental GA experience divulged:

*"I think I was more scared than she was; she didn't really understand what she had to do, I have been there with my other children, so I knew."*

Parents tried to cope with their worry and anguish about the immediate experience of the GA by describing their trust in professionals:

*"Here, doctors are professionals. They are highly trained."*

Despite their negative response to the GA, many parents seemed convinced that GA was the ideal way to complete their child's treatment, even "preferable" for their child, and superior to conventional treatment. Even the possibility of a second GA was not particularly worrisome. For example, the response of the mother who believed her child's



dental surgery was: "... the worst experience of my life, I'm not kidding you, it was horrible." to having a second GA was:

*"That's a hard question, I think it would depend on her age and how, how extensive the dental work is. If she needs a root canal I'd go for general anesthesia because even as an adult that freaks me out and I can't stand the thought of my child screaming through something like that like I've been in Monarch a few times and there's been kids have their cavities done and they come out and they're crying and their parents come out and they're shaking and I don't know I just don't want to be in that position again which is why I'm putting the amount of effort into it that we are."*

This mother having seen how difficult it is for young children to have dental treatment under local anesthesia seemed resolved that her child not go through such an experience:

*"I still think it was the best way to go, yeah, um, yeah, I mean I don't know, I would like to talk to people, I would be curious to see how a four year old would react to the amount of dental work that she had done without general anesthetic, I mean it would take multiple visits, it would take hours, um, I would do the same again."*

Clearly, despite the trauma of a dental GA, she thought the alternative to be far worse. Similarly, another mother was able to justify to herself that GA was preferable:

*"I'm kind of contradicting because what was explained to me is [with local anesthesia] the child can bite down or might be frightened and could hurt himself, that's why they like to put the children to sleep and do everything, so I thought it's safer ... There's also a risk with everything especially with little children, I think the mums are just too scared. I always feel there are risks with any surgery .... [long pause] .... I think it depends on the circumstances; it would just depend on what needs to be done, how serious the situation*

*is. If the situation is serious, I'd go for dental surgery, have them all fixed at once because I think I waited a little bit too long to get one of his teeth fixed, the first one that brought the problem up, it had to be removed so I don't want that to happen again."*

A Filipino mother also seemed convinced that the GA procedure was less "dangerous" for her child:

*"Fixing her teeth without the GA is also dangerous because you cannot hold her tight and she keeps moving. Putting her to sleep is better because she sleeps and she doesn't feel anything like pain; yea, I think GA is a better choice but there are always risks like any other surgery."*

One of the few "downsides" to a GA that was mentioned was the expense:

*"If she can have it done without GA, its best not have GA because GA is expensive and it is not covered by insurance."*

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."*

An overview of parent's experience of the GA is illustrated in **Figure 4.5**.

### **4.3.2 Outcomes of GA experience**

#### **4.3.2.1 Outcomes: related to child**

When parents' thoughts related to their child's reaction to GA were explored, most parents believed that their child did not remember the GA appointment. They made the following comments:

*"After the surgery, He was too young to remember it. What's past is over. He didn't feel any pain. Everything was normal. It's not uncommon to feel pain when the medication wears off."*

*"She can't remember much the GA ...but she did remember the sticker the nurse put on her before the GA session."*

However, two parents from our "relapse" group differed in their comments on this issue.

*"I think she still remembers the needle and those instruments."*

*"He remembers the surgery; he was talking about it last night. He prefers to go to our family dentist. He scares here; he has a phobia since his teeth pulled out here. He used to fight with our family dentist, but not any more! Maybe he still remembers the surgery."*

Perhaps, children who had more invasive dental procedures like multiple extractions were too overwhelmed from the dental work to remember the GA. In fact, 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. For example a First Nation mother explained:

*"... five teeth pulled out, it was just ridiculous; it hurt him. He was hurt and he is still hurt from it, that's why he doesn't let anyone open his mouth; he doesn't look in the mirror any more; yeah, it bothers him a lot."*

Similarly, a Filipino mother talked about her child's acute emotional response to losing some teeth and the social embarrassment that he explained:

*"After the surgery, a couple hours after when he wake up, he cried because he wants his teeth back to his mouth, he saw in the mirror and he didn't have any teeth. He was shy; he didn't smile; he covered his mouth; he was afraid someone teased him. His classmates were teasing him and he started crying."*

An Indo-Canadian mother also complained about her child's challenge related to her "post-GA" dental condition:

*"She was complaining that her friends think she is talking funny. I guess she is not very happy about losing the teeth."*

Some parents mentioned that their child had immediate trouble with eating because of the missing teeth:

*"Her eating is not back to where it was before the surgery, because she is still learning how to eat without the teeth she had before."*

Nonetheless, there were some other kids who actually got pleasure from their dental treatment and were proud of their new teeth:

*"He thinks he is very cool now that he got steel things on his teeth."*

*"But he liked the caps and he was so proud, he showed them to his classmates."*

In general, in the parents' opinions their child did not seem to be anxious as a result of the GA, but aspects of the dental procedures caused some distress. Similar to previous reports, our parents reported overall improvement in their child's well-being. Episodes of tooth pain decreased and sleeping patterns, eating habits, and tooth brushing improved. A mother of a 3-year old girl described:

*"She has no pain any more and she never wakes up during the night at all. She brushes her teeth a lot better now than she used to ...."*

Other parents also noted their child's increased interest in having good teeth after the surgery. The GA experience awakened an interest in their mouth that was not present before.

*"He has more awareness of his teeth. I think he cares more about his teeth."*

A mother of a 6-year old child excitedly described her daughter's oral hygiene behaviours after the GA:

*"I was very surprised this morning that she actually wanted me to floss for her. Usually I have to struggle with her, but this morning she got up and said " can you floss my teeth?" wow, it was wonderful; I was doing something else but I left that and I said lets do it now, when she was in the mood for it. Last night, when she came back from school and she had her snack; she went and brushed by herself; I didn't have to tell her, and then also after dinner, she brushed again. So I guess, now she realizes if she takes good care of her teeth it will be really better for her teeth. She doesn't like the idea of her front teeth going, as that makes her mouth feel funny. Now she is more on it. She advises her brother to brush more often."*

We wondered about any relationship between the GA appointment and cooperation at subsequent dental visits: would a child be more or less cooperative? At the one-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 future ability to cooperate:

*"First, she liked to go to dentist because they gave her stickers and rings, but when she saw all those things, she cried. Her behaviour in the office after the surgery was similar to her behaviour before the surgery. She had the fear that they might pull out her teeth again."*

Some parents even speculated that their child might avoid future dental visits as a result of long-term trauma after the GA. Parents repeatedly expressed:

*"She doesn't want to come back to the dentist; she would rather take care of her teeth than come here [Monarch]."*

*"She still doesn't like dental visit much."*

*"He is not really OK with a dental check-up"*

*"My daughter was still afraid of coming here for the check-up, but she still came [for recall]."*

*"His behaviour [at recall] was the same as the first time. He didn't like to see dentists, so we had to lie to him that all they would do was to put some medication on the back of his hand."*

*"He's afraid of seeing a dentist, regardless of whether GA or no GA was required; perhaps, he was afraid of pain."*

#### **4.3.2.2 Outcome: related to parents**

Most parents were satisfied with their child's dental treatment under GA and the outcome of the treatment. In the words of a Chinese mother:

*"We are really satisfied with the dental work done on my daughter. Because she was too young to cooperate, wouldn't open her mouth for the dentist to provide the treatment, GA was the only way to go then."*

All parents acknowledged that they learned valuable lessons and skills related to their child's oral health through the "GA experience":

*"Monarch told us that because he didn't brush properly and ate too many candies, he got cavities. Before, we didn't know that much. Now we know that if we keep the mouth clean and brush well then we won't get cavities. They also showed us how to brush after meal, and how to floss."*

Similarly, another mother explained the detailed information and practical instruction that she experienced from dental office as part of the GA experience:

*"They told me now, no milk at night, only water. They told me don't put food for him to nibble on, unless it's absolutely healthy food and if he has to have pop or candies, brush right after. They showed me a good technique with him when I brush his teeth. I was lost in the dark at first. And with him as a little kid (younger brother) from the day he got his first tooth, I had no problem. We brushed he was happy. With Aaron, he was crying everyday. Everyday he was, you know, like hold him down and go like this. But at the dentist office, she showed me put him in your lap and put your leg on top of him and the right way to brush."*

However, a new awareness of the importance of early dental visits and regular check-ups was reported only by the "no-relapse" group. The parents of children who were cavity-free at recall seemed to pay close attention to the importance of early and regular professional visits:

*"If we had a second child, we'd certainly be going to the dentist at nine months or a year or something and not waiting any longer."*

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 behaviours. The GA may have been the life event that stimulated behavioural change in our “no-relapse” families:

*“Surgery was like a wake up call. It was a wake up call for me; whatever I was told I'm doing it. Surgery was a wake up call for the grandparents too when they saw their grandchild, carried in half asleep, lying there and not being able to eat for a day. That was a wake up call for them so they don't make the same mistakes with the second one now. Before, if I wasn't giving him a treat, they were giving it to him. I think grandparents really don't know how to brush the teeth properly either.”*

Dental caries is a process. “Surgically” treating decayed teeth slows down the process by removing carious lesions and badly decayed teeth, but without major changes in preventive practices, the chronic disease of dental caries is still present. We wondered how our parents understood the role of the “GA experience” in the disease process and their child’s future susceptibility to new “cavities.” Parents in the “relapse” group perceived their child to be less susceptible to new cavities because all teeth were now “fixed”:

*“After the surgery I didn't expect my son having new cavities, at least not the teeth that had been fixed.”*

However, the “no-relapse” families were more uncertain about their child’s risk of “getting new cavities”:

*“I was completely paranoid about her getting new cavities because I became more aware of how much damage can be done in such a short time, it [surgery] was a rude awakening, and freaked me out. I didn't want her to have any more cavities because she's very young and the concept of her having to go through freezing and getting the drill and*



*all that sort of stuff, I just don't want her to have that experience, so we've put a lot of work into making sure that that doesn't happen."*

Similarly, another mother admitted that the chance for development of new decay was ever-present and parents needed to be vigilant:

*"Although we fixed all the teeth but there is always a worry. It's not like thinking that once the surgery was done, they fixed all the problems. The cavities can be back at later age too."*

Overall, the GA dental experience had enough impact to immediately motivate most parents to consider changing their behaviours related to their child's dental health. In fact, an "early" outcome of the GA was a reported improvement in parent's and child's dental health practices. Parents expressed different levels of change in their practices after the treatment. A 33-year old mother of an only child described:

*"We sort of made changes right away. We stopped giving her apple juice in a sippy cup. We used to just brush her teeth before bed; we now brush in the morning as well."*

Another mother similarly explained:

*"He is drinking out of regular cup now and he is not allowed to touch apple juice."*

Parents seemed willing to implement recommended preventive strategies. In the words of a 26-year-old mother of a 3½-year-old boy:

*"I am willing to do anything now to save the rest of his teeth that are left."*

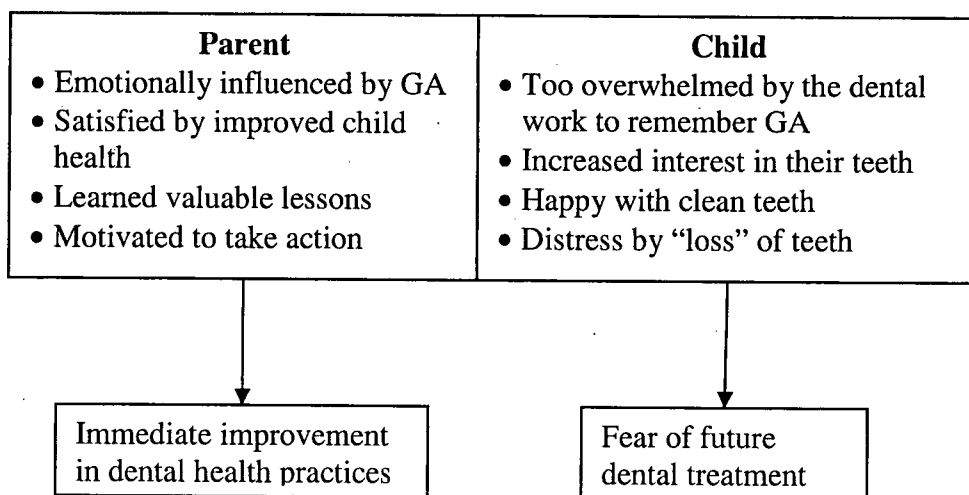
However, despite this initial enthusiasm, at the same time, parents appeared to be overwhelmed by difficulties in applying new healthy behaviours. Maintaining a proper toothbrushing routine amidst all the other daily pressures was quite an overwhelming challenge:

*“Brushing her teeth is still a hassle; it’s a lot of work. If it wasn’t for the experience I had with her having to go down and having so much tooth decay, I would think it wasn’t worth the hassle because it’s a lot more work in your day to try and break your own routine because you’re trying to get things done and get the kids out the door and get to work and the kids to school on time and the same thing in the evening like you just want them in bed, so you can sit down for an hour and not have children around, so it is a big commitment like it’s a lot harder than I ever thought.”*

The battle over ensuring a child had a healthy diet was also a challenge that was difficult to manage. A mother talked about the difficulties of controlling her son’s eating habits:

*“He doesn’t eat that many candies or anything; he is not that big a candy freak, but the most difficult thing is keeping them off the pop when he wants it; he still wants the pop in his hand, walking around with a can of coke.”*

**Figure 4.6** Short term outcomes of a dental GA



#### 4.3.3 The general anesthesia: theoretical propositions

The short-term outcomes of the GA experience are summarized in **Figure 4.6**. The propositions that emerged from this category are as follows:

- 1) The emotional response of the parents to the GA did not affect their willingness for their child to have another GA.
- 2) The more parents trusted the experience and competence of the “doctors”, the less concern they had about the GA.
- 3) The more dental extractions children had, the more emotionally and social troubled they were after the GA.
- 4) The GA experience increased children’s interest and awareness in their own dental health.
- 5) The “relapse” parents were more convinced that their child would be “cavity-free” after the GA than the “no-relapse” parents.
- 6) The GA dental experience had enough impact to *immediately* motivate parents to try to change dental health behaviours.
- 7) An “early” outcome of the GA was improvement in parent’s and child’s dental health practices.
- 8) Parents appeared overwhelmed by the difficulties in applying new dentally-healthy behaviours.

From the first three categories, social influences, family context, and general anesthesia, it appeared that parents shared quite similar motivators or “cues to action” to change their behaviours. They also experienced comparable challenges and frustrations in adopting and maintaining the new behaviours. Nonetheless, only some parents seemed to be able to

maintain these new positive behaviours over time. Now, I wanted to understand how parents differed in regard to basic parenting behaviours and what they “did differently.”

#### 4.4 Parental strategies

Parental strategies, in our context, were the methods that parents used to manage their child’s oral health. As parents tried out and experimented with different parenting strategies, they developed a particular style of parenting. Although parents seemed to develop different styles to cope with the daily struggles of child rearing and used a combination of styles, one style seemed to be usually predominate regarding their child’s dental health. Overall, our parents demonstrated three recognized parenting styles. We looked at these parenting styles in relation to whether a parent was in the “relapse” or “no-relapse” group.

To avoid confrontation, some families seemed to be more “permissive” to their child’s desires and allowed their child considerable self-regulation. For example a Filipino mother of two children in the “relapse” group described:

*“I pack them juice everyday for school; I don’t want them to drink water from the school, and he doesn’t like pure water anyway. I told him once that juices are sweet and not good for him; he has to drink water, but he said: “water doesn’t have any taste.” They cannot drink water, so I have to give them juice.”*

Similarly, another “relapse” mother explained her son’s snack habits at the second interview one year after the GA:

*“We give them treats once a week when we get our grocery like chips, candies; they love those things.”*

In contrast, other parents seemed to be highly demanding and directive, but not responsive to 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. In the words of a Filipino mother:

*"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."*

Another similar comment from a Chinese mother who actually used the threat of another dental GA to get her child to behave:

*"Asked him several times not to eat candies, but he doesn't listen; he may accept it if I tell him that they're going to put you to sleep again because he's scared, so maybe he listens."*

While some "relapse" parents seemed at a loss as to how to control their child's diet or oral hygiene in the immediate future, most "no-relapse" parents seemed to have already developed conscious plans to carry out healthy behaviours for their child's oral health. An "authoritative" approach seemed to be used mainly by the "no-relapse" parents with respect to their child's dietary habits and oral hygiene practices. They tried to teach and supervise clear standards for their child's behaviours. Their disciplinary methods were supportive, rather than punitive. For example, an Indo-Canadian mother explained:

*"I always show her how to brush; so she watches me when I do it so. When I brush her teeth, if she is in the mood, she would let me; otherwise, I stand by her and let her brush and then I sing or I draw something on the mirror to distract her, then I take over and brush her teeth."*

An Eastern European mother used a "role modelling" technique to capture her daughter's attention:

*"I think the biggest difference is we brush our teeth together; I stand right next to her; she sees me brushing my teeth; like instead of getting her ready for bed, putting her in her pyjamas and sending her out of the room and she would never see me getting ready for bed, do you know what I mean? She would never see me brushing my teeth or in the morning I wake up, I have my shower, I brush my teeth, I get dressed and then she wakes up, so she never seen me brushing my teeth in the morning either. Now, I wait for her like I will do everything and then wait for her and we brush our teeth together in the morning and then we brush our teeth together at night."*

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 would tell her that she should eat broccoli first and then have ice cream because it will taste better."*

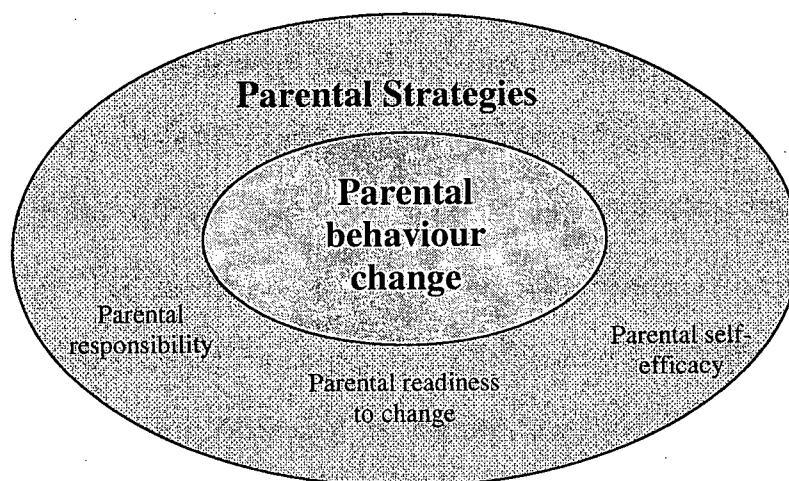
The same style was used by another "no-relapse" mother:

*"When they throw a tantrum for something that they want to have it like candies, I would say "no, I don't have any money today to buy candies for you, I have to buy this and this, certain things, and that's all I'm buying", so they just stop complaining."*

In summary, it seemed that the strategies parents developed to help them were related to their success in making long-term behaviour change. The strategies were inextricably linked to parent's individual parenting style. Now, the question is why some parents

seemed to be more determined to find a way to overcome barriers and were more receptive to receive support from the available resources and others were not so willing and simply returned to their previous unhealthy practices. Parental strategies and its attributes are summarized in **Figure 4.7**.

**Figure 4.7** The category of parental strategies



#### **4.4.1 Parental self-efficacy**

Parents in our study demonstrated different levels of self-efficacy regarding their own oral health. Parental self-efficacy is a parent's perceived control over the behaviours related to their child's oral health. In the words of a mother in the "relapse" group:

"I know that the teeth can be kept for lifetime. We can keep our teeth clean without any cavities. It shouldn't be a problem to maintain them, but it's hard to guarantee that there won't be any caries. I don't think I can!"

While a mother in the "no-relapse" group looked around her and realized that it was possible to be cavity-free:

*"I think I am able to prevent cavity, because I have some family members who don't have any cavities at all"*

Similarly, parents also had different levels of self-efficacy related to control of their child's diet and success with toothbrushing. One of the "relapse" mothers knew that "logically" cavities could be prevented but freely admitted that not all of us are able to do so:

*"Cavities in children are preventable logically, but maybe not everyone can do that. With having less sugar, no candies, no sweet stuff, brush the teeth, drinking water, and no juice you can prevent it, but I think it's very hard to do for both parents and children."*

And another "relapse" mother simply felt that children's temperament and behaviours were too much of a challenge for a parent to prevail and do everything right:

*"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."*

For the same situation, a "no-relapse" mother was willing to persevere and overcome the challenges of daily home care:

*"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."*



Parental self-efficacy seemed to be related to simple issues like uncertainty about correct toothbrushing techniques, but mostly to a self-reported “over-sensitivity” to the child’s desires like child’s food choices or simply not liking to have their teeth brushed.

#### **4.4.2 Parental responsibility**

While most “no-relapse” parents took responsibility and “shouldered” the blame for the state of their child’s teeth, some parents in the “relapse” group seemed to absolve themselves of responsibility and to blame the child or even professionals for the problem. One of our “no-relapse” mothers stated her feelings on the parent’s responsibility and the need to take action to protect her child from dental disease:

*“I know it's easier said than done, but we should realize that it's our responsibility not the problem of the child, so I think its not about the difficulty of the procedure; its not about the barriers, its about taking responsibility, its about taking action, its about taking responsibility in your hands. The knowledge is there if you take it, prevention is there if you take the action. As a parent we should take the action.”*

Another mother described how good one could feel as a parent if one is willing to take the responsibility over her child’s dental health:

*“I stopped the bottle because I wanted to be a good mom! After I stopped the bottle, I thought ok I stopped the bottle and I’m a good mom right? No problems with his teeth. To me its like I’m kind of scared like if my child goes into the dentist office with a cavity, I’m bad! So to me its like I have to make him perfect in six months he has to go into the dentist's office, no cavities, comes out, its my job, I’ve paid for that visit to have his teeth cleaned, I have to maintain it. I’m always sitting there waiting for the dentist to say:*

*"great, perfect"; that just makes me feel great, I walk out of there happy that I've done a good job."*

On the other hand, a Chinese mother just seemed to throw up her hands in disgust. She felt that preventing cavities was the role of the dentist and that as a parent she had little control over her child. She seemed to have no guilt about the state of her child's teeth:

*"I don't think there's much room for improvement in my daughter's case. I reached to my limit. I have one child before Alice, I would have learned from having the first, but every child is different. Had she been like my son to listen to me a bit more, there might be some improvement. I don't feel guilty in it. Even if they [dentists] say there are some ways to stop cavities, I'm not interested to learn. That's the work of dentist. I (for children) see dentists twice a year. If they didn't like it [fluoride] and wanted to spit it out, then that's beyond my control too."*

These words were echoed by a mother of a 4 years old boy who felt her preschool son was to blame for the state of his teeth:

*"Well, he's responsible; there was no difficulty with brushing his teeth, but I think he should learn how to do it by himself."*

And a similar comment from a Filipino mother blamed her child:

*"He got cavities because he is not brushing his teeth properly. He doesn't want me to brush his teeth. Well, he's responsible, he doesn't want me even floss his teeth, he does it himself. I try to help them but they say no, I can do it, I can do it."*

In addition to not feeling responsible some parents, mostly 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. They simply ran out of the time and energy to devote to their child's teeth:

*"I wanted to brush his teeth, but I'm too lazy to brush every night; there was no difficulty with brushing his teeth, but I think he should learn to do it himself anyway."*

*"Sometimes when you are lazy you let them brush themselves!"*

*"I brush his teeth, my son cooperates too, cooperates enough to let me brush long enough, but sometimes, I'm lazy."*

*"It's really hard to spend all your time and energy on your child alone. Sometimes, I'm just too busy to look after their teeth properly."*

*"His father usually brushes his teeth because I don't have enough patience to do it ..."*

*"I didn't pay any attention to his teeth"*

Therefore, despite initial enthusiasm, parents had differing senses of responsibility, commitment, and willingness to devote to practicing new healthy behaviours.

#### **4.4.3 Parental readiness to change**

Parents also seemed to be at different levels of readiness to be able to adopt and maintain positive changes over time. As described in the Transtheoretical model, our parents represented the four different stages of behaviour change. Some "relapse" parents seemed to be in the "pre-contemplation" stage. They did not seem to have any plan to take action in the foreseeable future:

*"We give them treats once a week when we get our grocery. His diet has not been changed that much; they love treats, I cannot stop them."*

And others were in the "contemplation" stage of change. They were ambivalent about the advantages and disadvantages of consciously making a change in behaviour:

*"May be I should stop giving them candies, I don't know, I cannot stop them, may be I should tell him stop eating candies. I don't know if he accepts."*

On the contrary some parents, mostly in the "no-relapse" families, seemed to be in the "preparation" stage. They were intending to take action and had already had a plan for an immediate future:

*"They like candies; when we go shopping, we are aware that they want it, so we buy it for them; but we try not take them shopping with us, that way, there's no conflict."*

Some parents were even in the "action" stage and had already made specific and measurable modifications in their practices:

*"I don't buy candies or pop around the house any more. They're not in my grocery list, like, I don't replace them all the time."*

At one year follow-up, most "no-relapse" families still talked about the improvement in their child's oral hygiene and eating habits. They had been ready and motivated to change their behaviours; they made the change and now were managing to maintain positive change:

*"She already been here [at Monarch] two times for cleaning and fluoride; she doesn't have any new cavities, but there is always a concern about that, so we try to avoid like eating too many candies and too many sweet things so she doesn't have the problem. She does not have any more problems because I changed my thinking."*

We heard another mother who had also, in her opinion, made and maintained significant change at least with brushing. However, she admitted to less success with her child's diet and, unfortunately, her child had new caries:

*"I thought I was cleaning more than before and he was having less [pause] not really less but a little bit less sugar than before. I brush longer and almost every night [pause] maybe not every night, but I think 9 out of ten. I also floss his teeth. I still do it, but may be not well enough."*

Another "relapse" mother, similarly, reported less progress in her child's diet compared to his oral hygiene:

*"We didn't really change that much their diet, but now we spend a lot of time on their teeth. In the past, we might let them sleep without having their teeth brushed, but now we no longer let them do that. We are much stricter. We pretty much did all we could do. So, if they still have problems with their teeth, I don't know what else we can do. I would still do the same."*

In summary, for this group of parents, it appeared that, because of the "GA experience," all parents were aware that a problem existed. They also seemed to be confident about the amount of knowledge that they received about the causes of dental decay and methods of prevention. However, one year after the GA, some parents seemed to have no intention of changing their behaviours or seemed to be ambivalent and were considering action but were not yet committed to the action. Our parents differed on a number of dimensions related to how they perceived the "costs and benefits" of change, their perceived ability to change, and the strategies that they developed to establish long-term change. Only those families who took more responsibility, seemed to be more confident about their control over their child's dental health, and were furthest along the stages of change continuum were able to maintain positive behaviours over time.

Therefore, the category of parental strategies was identified as the core category of our parental behaviour change model.

#### **4.4.4 Parental strategies: theoretical propositions**

- 1) An authoritative parenting style was a predictor of adoption of dentally healthy behaviours.
- 2) Parents who took more responsibility for their child's state of health felt more guilt and were more determined to develop strategies to overcome the barriers in applying healthy behaviours.
- 3) Parents who blamed their child for their dental problems were less likely to successfully adopt healthy behaviours.
- 4) Parents who had a higher level of self-efficacy were more likely able to engage in and maintain new healthy behaviours.
- 5) Parents who were furthest along the stages of change continuum were more likely to be able to maintain positive behaviours over time.

**CHAPTER V**  
**DISCUSSION AND CONCLUSIONS**

In this chapter, I will first of all discuss the strengths and weaknesses of this dissertation research and the techniques that we used to establish the trustworthiness of the findings in order that they can be understood within the limitations of the study. Next, the evolution of the final conceptual model is thoroughly discussed. I then discuss the significance and implications of the “emerged” model for research and practice. The chapter concludes with thoughts on future research directions.

### **5.1 Limitations of the research**

This research has limitations that shall be acknowledged. First, similar to any qualitative study, findings cannot be “generalized to the general” population. However, this study provided insights into a range of opinions and comments of parents from a variety of cultural backgrounds (e.g. Aboriginal, Eastern European, South African, Filipino, Chinese, and Vietnamese). Indeed, the diversity of “our” families is quite similar to the range of cultures routinely encountered in a large multicultural city like Vancouver. In addition, both mothers and fathers were invited to participate in the study. Although most of our participants were mothers, the four volunteer fathers were welcomed into the study. Thus, the viewpoints of both moms and dads contributed to our findings. 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, i.e. paying from “out-of-pocket” to partial or total support from publicly-funded programs. Nonetheless, our findings are limited to the specific group of families who were treated in this private dental practice.

The second limitation was that we grouped the children into the “no-relapse” and “relapse” group based on the presence of any carious lesions (radiographic and/or visible



caries) at 6 month recall. However, caries is a continuum and the diagnostic tests for caries used by clinicians in this study, visual and radiographic exams, are inherently imprecise. Thus, we acknowledge that the “no-relapse” group may develop caries in the future, but the “relapse” group demonstrated an increased rate of acquiring caries by the presence of detectable carious lesions as early as the 6 month follow-up.

A third limitation was our inability to interview as many “relapse” families for a second time as we had hoped because these families could not be contacted by telephone or by mail or because they repeatedly failed to present for a second interview. To increase our 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 enriched the depth of information that we gathered.

Ideally, our parents should have reviewed our conceptual model so that they could comment on the “fitness” of the model to their specific situation. Unfortunately, because of limited access to the participants (e.g. refusal to be interviewed again or our inability to locate them), they were not able to confirm the fitness of our theory to their situation. Certainly, an area of further study will be to interview parents whose children have been treated for extensive dental caries to validate and test our emerged theory.

## **5.2 Establishing trustworthiness**

Similar to results of quantitative research that must undergo testing to determine validity and reliability, the qualitative researcher must convince the reader that the findings have trustworthy merit. Standards like reliability and validity that evolved from a positivist approach cannot be applied to qualitative research in a straightforward fashion.<sup>81</sup> In qualitative research, credibility, transferability, dependability, and confirmability are

substituted for the traditional criteria of internal validity, external validity, reliability, and objectivity respectively.<sup>170</sup> We used the following techniques to ensure that our findings met these criteria.

### **5.2.1 Credibility**

Credibility refers to one's confidence in the "truthful value" of findings or the theory that emerges from the qualitative data. Strauss and Corbin (1998) indicate that the credibility of the emerging study is largely determined by how the researchers conduct the study.<sup>149</sup> In the present study, I used triangulation, peer debriefing, and member checking to ensure the credibility of the findings.

#### **5.2.1.1 Triangulation**

Using multiple sources or methods of investigation, i.e. triangulation, is one way to increase the credibility of qualitative findings. In the present study, different methods of information collection were employed including interviews, on-sight observations, fieldnotes, and a brief questionnaire. The quantitative data from the questionnaire provided an overall description of the parents and children in our study. However, this data also supported some of the information that participants provided in the interviews such as the child's feeding information or dental history. A detailed statistical analysis of the demographic data was not indicated because of the small sample size. However, in most instances, our quantitative data supported the qualitative findings (e.g. the baseline caries status, represented by average "dmfs", was greater for "relapse" group compared to "no-relapse" group).

As a further method of triangulation, we tried to compare parents' recollections of what occurred in the dental visit with the dentists' reports of what occurred. This verification of the preventive counselling experience involved observations and fieldnotes. For example, I observed a series of preventive counselling interactions between the dentists and the parents. Although receiving preventive advice was acknowledged by only some of our parents, mostly in the "no-relapse" group, this exchange was, in fact, a routine office practice. In other words, both the "relapse" and "no-relapse" families received the same information or training, but only the "no-relapse" group acknowledged the experience. When dentists were asked about the counselling that they provide for their patients, they confirmed that:

*"We'll give them the same talk about diet and brushing and how they can prevent cavities; everyone gets the same information. But for some GA patients, they're not really listening because they're more worried about fixing the teeth so I think after they've had all the teeth fixed, the first visit they have afterwards, that's a good time to talk about prevention."*

This difference in recollection supported our finding that the "no-relapse" group, at a further stage along the continuum of change, were also more open to and aware of counselling messages. In addition, following each interview, notes were made regarding the interview, the topics discussed, and my subjective thoughts and feelings about the participants and the interview process. Overall, information from these different sources was consistent with each other.

#### **5.2.1.2 Peer debriefing**

Peer debriefing is the process of:

“... allowing a peer who is a professional outside the context and who has some general understanding of the study to analyse materials, test working hypotheses and emerging designs, and listen to the researcher's ideas and concerns.”<sup>171</sup>

(Erlandson *et al.*, 1993, p. 140)

In this study, all the transcriptions were reviewed by two individuals other than the interviewer (transcriber and supervisor) to ensure accuracy in the documentation of parents' comments. The conceptualization of parents' statements and the interpretation of the information were also reviewed by the supervisor at one-one-meetings and by the supervisory committee at regular meetings. In addition, the three dentists from Monarch were interviewed at the end of study. The findings from the analysis of interviews with the parents were discussed with each dentist individually. Their experience and observations confirmed our findings.

#### **5.2.1.3 Member check of study participants**

In this technique, the research findings are shared with the participants to verify the researchers' interpretations and to enhance the credibility of the findings. In this study, because many parents could not be or chose not to be contacted for follow up, we did not get participants' confirmation of the “fitness” of our model to their experience. However, the second interview with those families who consented to a follow-up interview provided an opportunity to confirm and clarify their original comments from the first interview. For example, in the first interview, when I explored parent's general concept about oral health and prevention of the disease, a 29 years old mother of 2 boys said:

*“Honestly, I think an odd cavity is ok, because I don’t think, there is anybody out there without a cavity and it happens, even if it is preventable but it happens!”*

I could not understand what she meant by saying “it happens”. This statement could indicate her external Health Locus of Control belief such that she believed her child’s oral health was influenced by external causes. She also may doubt her ability to control the disease (dental self-efficacy) or she just simply under-valued the effectiveness of preventive methods. Thus, in the second interview, I asked her to clarify her original comments and she replied:

*“When I said it happens, I didn’t mean that you don’t have control on it. You do have control. If you take the bottle away from the kid, he’s not going to have bottle tooth decay. There is no such “external control” over the situation. It happened because I think I did the wrong thing, it’s my fault. I still do blame myself for his teeth. It (tooth decay) happens with lack of care like anything can happen with lack of care, an accident is preventable but it happens.”*

In addition, at the conclusion of each interview, the key points were summarized, repeated back to the parents, and modified as necessary. Parents were also invited to add any other issues that they felt were important and had not been addressed within the interview.

### **5.2.2 Potential transferability**

Transferability refers to the possibility that the results of qualitative research in one context can be transferred to another context or setting. In the other words, the findings of a qualitative study may indeed be applicable to those beyond the individual participants. As Lincoln and Guba (1985) point out:<sup>170</sup>

“If there is to be transferability, the burden of proof lies less with the original investigator than with the person seeking to make an application elsewhere. The original inquirer cannot know the sites to which transferability might be sought, but the appliers can and do. . . . The responsibility of the original investigator ends in providing sufficient descriptive data to make such similarity judgements possible.” (p. 298)

Therefore, the degree of the transferability of the findings will largely depend on the similarity of the contexts and population studied. It is not the researcher’s role to provide an “index of transferability”. In this study, information on participants’ demographics collected by the questionnaire (e.g. family’s ethnicity and SES, mother’s age, mother’s level of education) and a detailed description of the recruitment methods and the study setting will enable other researchers to determine the applicability of our findings and the emerged model to their population of interest.

### **5.2.3 Dependability**

While quantitative researchers are concerned with reliability or the reproducibility of their results, qualitative researchers are concerned with the dependability of their findings.

Strauss and Corbin (1998) suggest the following definition for dependability: <sup>149</sup>

“Given the same theoretical perspective of original researcher, following the same general rules for data gathering and analysis, and assuming similar set of conditions, other researchers should be able to come up with either the same or very similar theoretical explanation about the phenomenon under investigation.” (p. 266-267).

For this study, each step of the research process and the analysis of the information was examined by other researchers (supervisor and committee). Any discrepancies in conceptualizations were continually discussed and modified. The emerged model was regularly presented to the supervisory committee and to other peer reviewers as it was

developing. Discussions with my supervisory committee and critiques by reviewers of the three journals who have published or will publish the papers have helped in consideration of alternative explanations and helped to develop the model. In addition, this research in its various stages of development has been presented at research meetings, including the International Association of Dental Research (IADR) and the Canadian Academy of Pediatric Dentistry (CAPD). These interactions with other researchers, clinicians, and behavioural scientists have further challenged and improved the model.

#### **5.2.4 Confirmability**

Confirmability refers to the degree to which qualitative research findings can be confirmed or supported by others. In this study, the collection of the information and the analysis procedures were examined by my supervisory committee for potential bias or distortion. In addition, I also interviewed the three attending dentists who provided the treatment for the participant families. First, I explored their views on our findings from the interviews with parents and then I introduced the main categories in our final model. The dentists compared our interpretation of the categories with their experiences and “beliefs.”

### **5.3 Evolution of the model**

In this section, I will present the evolution of the model as a two-phase process. First, I would like to revisit the research questions that initially guided the information collection and inquiry process in phase I of the study. Then I will highlight the findings that led me to the categories of the original models. In phase II, I will introduce the new questions that evolved from the phase I findings and led to the emerged categories that eventually formed our final conceptual model.

### **5.3.1 Phase I**

The phenomenon of interest to explore was caries relapse in young children after oral rehabilitation under general anaesthesia. Therefore, my three original research questions were:

- 1- What are parents' beliefs and behaviours that may place their child at risk to caries relapse?
- 2- How do parents experience their child's general anesthetic dental treatment? How do they perceive the impact of this treatment on their child?
- 3- What is the short-term effect of the GA on parent's oral health behaviours?

These three questions were thoroughly explored in the first set of the interviews with parents at their child's follow-up appointment 7 to 14 days after the GA. The experience of the GA from a parent's perspective and the short-term impact of this experience on parent's subsequent oral health behaviours have been previously reported.<sup>172, 173</sup> The original conceptual model that emerged from the first set of the interviews is presented in **Figure 5.1**. The model introduces three main categories that became part of the final model.

- 1) Parent's general concept of oral health
- 2) Parent's experience of the GA
- 3) Parent's perceived outcome of the GA.

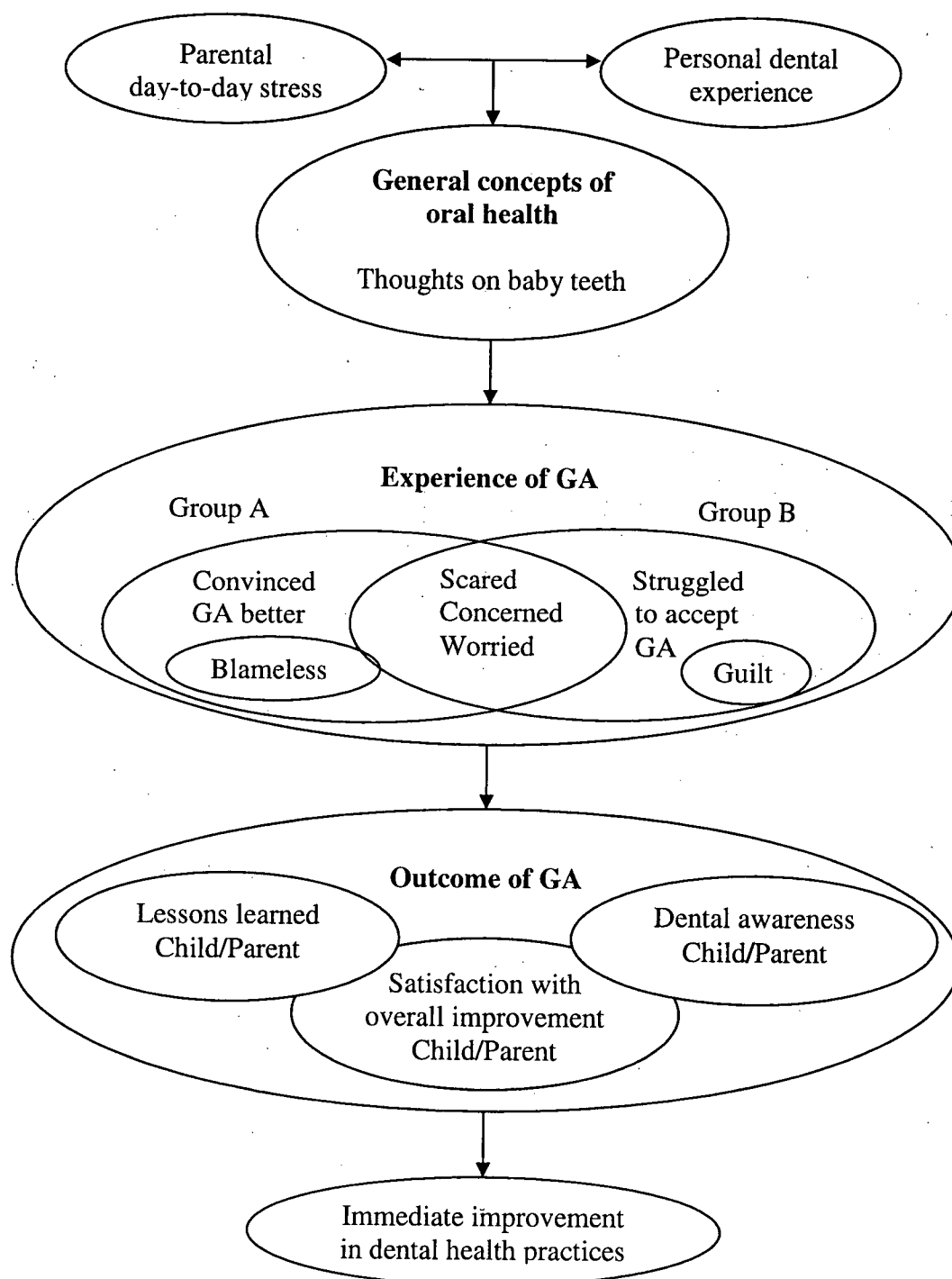
#### **5.3.1.1 Parent's general concept of oral health**

Parents' perceptions of oral health in general may serve as a barrier to their child's optimal oral health.<sup>174</sup> These perceptions can affect the preventive dental care children receive at



home and their use of professional dental services. In revisiting the Third National Health and Nutrition Examination Survey (NHANES III) conducted during the period 1988 through 1994, Talekar *et al.* (2005) demonstrated that parents' perceptions of oral health were correlated with parents' subjective assessments of their child's need for dental care.<sup>174</sup> Eighty-nine percent of parents rated their child's oral health as excellent, very good or good, and 11 percent rated it as fair or poor. Parents perceived their children's oral health to be worse if they perceived a need for treatment or preventive dental care for their child. Therefore, understanding the factors associated with parents' perceptions about their own and their child's oral health will help us understand why some children do not receive the recommended home care or professional care.

**Figure 5.1** An overview of original categories and sub-categories (Amin *et al.* 2006)



In the present study, parent's perception of oral health and the practices they undertook for their pre-school aged child were examined. Most families appeared to be engaged in "disease prevention"<sup>1</sup> rather than a "health promotion"<sup>2</sup> approach. When the definition of prevention was reviewed with parents, taking action in advance to prevent "cavities" or restoration of existing decay were identified as components of prevention. They were more concerned about immediate health threats like dental pain for their child rather than practicing healthy behaviours to promote oral health in general. Preventing "problems" was of more concern than being "healthy." Before the GA, these parents had not been involved in thinking about or planning for promoting their own or their child's oral health behaviours. Similar to what Roden (2003) identified in a recent qualitative study with families,<sup>175</sup> an overall health promoting family type was in the minority in our study. For example many of our parents believed that: *"If there is no pain or discomfort, then I'll consider my teeth healthy."* Therefore, dental professionals need to be more active and creative in educating, coaching, and supporting families to understand that optimal oral health is just another important component of an overall healthy lifestyle.

Factors related to parents' general perceptions of oral health were also explored. The four motivating factors proposed by the Health Belief Model<sup>96</sup> (perceived susceptibility to dental caries, perceived seriousness of losing teeth, perceived costs and benefits of prevention) did not appear to be related to occurrence of caries relapse in families in this research. However, these factors may explain why both groups of children developed caries in the first place. Of interest is that the HBM has also not proven useful

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<sup>1</sup> Disease prevention involves efforts to stop the onset of a specific illness or condition

<sup>2</sup> Health promotion involves efforts to increase control over and to improve families' health

in predicting children's preventive dental health behaviour in terms of dental visits,<sup>176</sup> participation in a preventive program,<sup>102</sup> or adherence to at-home mouth rinsing.<sup>103, 104</sup>

Because parents may ascribe differing values to baby teeth, their viewpoints about baby teeth were explored. Indeed, parents had quite a range of viewpoints about "baby teeth". While the "no-relapse" parents talked about the potential risks of carious teeth, the relationship between baby teeth and adult teeth, and the importance of preserving baby teeth, "relapse" parents 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 devotes to preservation of baby teeth, even after the GA. Other researchers have also identified ascribing a low value to baby teeth as a serious obstacle to preventive programs targeting young children.<sup>79</sup> Therefore, the importance of healthy baby teeth for healthy adult teeth should be emphasized from an early age.

#### **5.3.1.2 Experience of GA**

Parent's preparation for, attitudes and emotions about, and experiences of their child's general anaesthetic dentistry were explored in this study. Some parents felt well-prepared and were satisfied with their amount of preparation. In several cases, they thought the GA was "preferable" for their child and superior to local anaesthesia. GA was perceived to be the only possible way to successfully treat their young child. Mohamed Tahir *et al.* (2002) explored parents' general understanding of their child's proposed dental treatment in an outpatient general anesthesia session.<sup>177</sup> They reported that parents were more likely to understand the nature of the dental treatment than the type of anesthesia to be used. They were aware of the number and the type of teeth to be extracted because they probably believed that the dental extractions would cause a fairly significant 'degree of injury' to

their children. They did not appear too concerned about the type of anaesthesia because they did not perceive it as a potential hazard to their children, which in reality would have much more serious risks than tooth extraction.<sup>178</sup> In contrast to Mohamed Tahir *et al.* report, most parents in our study did realize GA was potentially hazardous for their child's health. Although some parents were more concerned about the dental outcome of the procedures, almost all parents talked about increased anxiety and worry during the GA. Parents also feared being blamed for exposing their young child to a high-risk procedure. Consequently, a few mothers felt "guilty" and blamed themselves. In fact, some mothers admitted that they might have been able to prevent their child's dental troubles. While parental "guilt" might be a cue for parents to re-examine their responsibilities for their child's oral health, to take action and to change their behaviours related to their child's oral health, placing blame on parents and making them feel "guilty" may also cause parents to be more resistant to any advice at all.

#### **5.3.1.3 Outcome of GA**

Parents usually have a positive impression of the dental outcomes after their child's GA.<sup>65</sup>  
<sup>179</sup> Parental satisfaction with the dental care that their child received under general anesthesia, and their perception of the impact of this care on physical and social quality of life were explored by White *et al.* (2003). Their findings indicated that dental care under general anesthesia for preschool children had a high degree of acceptance by parents and was perceived to have a positive social impact on their child.<sup>65</sup> Similarly, almost all parents in our study reported "post-GA" improvements in their own and their child's oral health behaviours. Most children were pleased about their new clean mouth and wanted to keep it that way.

While parents described their children as generally happier after oral rehabilitation because of a general improvement in well-being, some children had difficulties coping with the consequences of extraction of their teeth. In fact, losing a number of teeth was a shock to many children. Similarly, Hosey *et al.* (2006) reported that 63% of preschool and school age children who had a dental extraction under GA suffered next day morbidity and 24% still had symptoms a week later.<sup>180</sup> However, most of these children were “dentally anxious” in the first place, which might affect their degree of distress and postoperative morbidity. Some of our parents even suggested that their child might avoid future dental visits as a result of long-term trauma after the GA. Therefore, if children were prepared in advance both by parents and dental staff, the shock of losing teeth might be less profound and the likelihood of future “dental avoidance” might be diminished. All dental professionals involved with GA dentistry should consider how to advise parents prior to the appointment about counselling their child about planned extractions.

In addition, most parents admitted deficiencies in their knowledge before the GA. However, they all reported a better understanding of caries risk factors after the “GA experience” and felt confident in the adequacy of their new information. Nonetheless, new healthy behaviours did not seem to last for all parents simply as a result of increased knowledge. In fact, although accurate knowledge is necessary, it is not always sufficient, as it is not uncommon for educationally-based intervention efforts to only have modest and short-term effects.<sup>59, 181</sup> This finding is not new, but is often forgotten in the planning of dental health interventions focusing on parents.

In summary, our first set of interviews revealed that all parents acknowledged an immediate change in their behaviours as a result of the “GA experience”, but the new

dentally-healthy behaviours did not seem to endure. In fact, the instant change in parents' behaviours might be only an "emotional" reaction to a "painful" experience. Although emotions are thought to play an important role in determining overt behaviour,<sup>182</sup> more factors are necessary to introduce a long-lasting change in parents' oral health behaviour.

### 5.3.2 Phase II

As the study progressed and the early interviews were analysed, additional questions became of interest. For example:

- 4- What is the long-term effect of GA, if any, on both parents and their child's oral health practices?
- 5- What barriers do parents face in maintaining healthy behaviours over time?
- 6- What factors facilitate changes in parent's oral health behaviours?

To explore the long-term effect of the GA and to better understand parents differing journeys following their child's GA and their attempts to maintain the healthy behaviours over time, I invited the first set of parents, Cohort A, to a second interview 6 to 12 months after the GA. Because of the poor response from the "relapse" parents in Cohort A, another cohort, Cohort B, whose children were in need of a second GA because of new caries, but had not been part of the first cohort, were also interviewed. The comparison of similarities and differences between the responses of the "no-relapse" and "relapse" families guided the analysis and led to formulation of a conceptual model of parental behaviour change illustrated in **Figure 4.1**.

It is because existing models do not adequately explain the relationship between parental behaviours and their child's oral health that we develop this new model. Therefore, it is worthwhile revisiting some of the models commonly applied to behaviour

change and examining their strengths and weaknesses. For example, to apply the HBM to early childhood caries, if parents believe that their child is susceptible to dental caries, that primary teeth are important, that dental caries is a serious threat to their child, and that dental caries can be prevented, then they should be willing to limit their child's exposure to sweets and assist the child in practicing appropriate oral hygiene. In other words, parents with better information will make better health decisions about their child's oral health. However, the HBM has not proven useful in predicting the preventive dental health behaviours of children in terms of dental visits,<sup>101</sup> participation in a preventive program,<sup>102</sup> or adherence to at-home mouth rinsing.<sup>103, 104</sup> Similarly, in our study, most parents admitted that there were gaps in their knowledge before the GA, but they felt more confident in the adequacy of the information acquired as a result of the "GA experience." Therefore, based on the HBM, parents were expected to make obvious changes in their behaviours related to their child's oral health, but few parents seemed to be successful in maintaining the new healthy behaviours over time. Therefore, other factors not involved in the HBM affect the process of behaviour change.

Another theory that could be applicable to parental behaviour change is the self-efficacy theory which focuses on beliefs about one's personal abilities to perform a specific behaviour. Self-efficacy has been demonstrated to be an accurate predictor of oral health.<sup>114-116</sup> However, in the family context it is "parental self-efficacy," which explains parent's beliefs on their ability to perform behaviours related to their child like toothbrushing. Because of the many external factors that influence parental self-efficacy, this theory seems incomplete to predict parental behaviour in terms of child oral health.



The Transtheoretical model (TTM) of behaviour change was also developed to explain how people make successful and lasting positive change in their lives and how their efforts can be best assisted along the way.<sup>123-126</sup> The Framework of TTM contains four components: the stages of change, processes of change, decisional balance, and self efficacy and “Stages of change” is the central organizing construct of the model. One criticism of TTM is that the classic utilization of the model may result in significant misclassifications of subjects. For example, subjects may be classified in maintenance because they think that they have changed their behaviour, but in-depth analysis shows that they did not perform the recommended behaviour and thus should have been labelled as pre-/contemplators. In addition, the definition and measurement of the stages need to be better clarified. The Transtheoretical Model also does not state the factors that are important for each of the stage transitions and it does not specify the causal relationship among the pros and cons, confidence and lack of confidence, and process of change.

Our research has introduced a conceptual model (**Figure 4.1**) that may explain why some parents were able to make obvious modifications in their behaviours related to their child’s oral health and to maintain the new healthy behaviours over time and some parents were less successful. It also suggests some motivators for parents to “take action” as well as barriers that hindered their efforts. The supports that parents relied on to overcome the barriers are also included. This conceptual model communicates our understanding of factors affecting parental oral health behaviour change. Application of the model may help in designing interventions to facilitate the process of behaviour change. Our intention was to develop a model from the “ground” and the four components of the model implicitly emerged from the data. The model introduced four categories:

- 5) Social influences: including barriers and motivators or supports
- 6) Family context: including parent's perceptions and beliefs about oral health
- 7) General anesthesia: experience and outcomes
- 8) Parental strategies: including parenting skills and parenting styles

#### **5.3.2.1 Social influences**

The circumstances in which parents live and work have a profound impact on their health behaviours and their child's well-being. Various theoretical models have been developed to explain the link between biological, behavioural, and social determinants of oral health.<sup>183-186</sup> These theoretical approaches describe how social environments influence health behaviours. For example, an explanatory model developed from an international cross-cultural study proposed the main influences on the development of risk factors for caries. This model describes the impact of psychosocial factors such as poverty and ethnic diversity associated with caries development both within and between diverse population groups.<sup>184</sup>

Similarly in our model, social influences appeared to either impede or facilitate parents' optimal oral health behaviours for their child. For example, parent's cultural beliefs related to dietary practices and role of health professionals were identified as a barrier that may hinder parent's endeavours to adopt dentally-healthy optimal behaviours for their child. Therefore, an appreciation of the impact of cultural diversity is important in understanding how parental attitudes to oral health may vary across different cultures.<sup>78, 80</sup> Our study suggested the need for further exploration of beliefs of immigrant parents about oral health and their child.

Interestingly, our Chinese families also seemed to be somehow different from other minorities. They were more permissive about their child's food choices and more reliant on professionals rather than their own actions. Given the small number of participants in our study, the families may not be a typical sample of the Chinese population in BC, which in itself is culturally-diverse. However, similar findings were suggested for Chinese Americans in an international study.<sup>80</sup> Chinese families were reported to have a more external control belief that "preventing dental decay is the dentist's responsibility" compared to White, Mexican, and African American.<sup>80</sup> Therefore, the development of health promotion strategies must be culturally sensitive to ethnic minority groups whose input must be invited for program design and development.

In addition, regardless of ethnic background, all parents expressed a clear desire to do what was best for their child to promote good oral health immediately after the GA. However, some parents seemed to be resistant to "advice" coming from professionals because "*the doctors never experienced it themselves; they just learned those thing at school!*" To overcome such parental resistance, counselling could be delivered through community-based programs by trained parents who have had a similar experience and/or cultural background to that of these parents. Many parents in our study acknowledged the positive effect of supports from the wider community and they suggested community awareness programs for new parents.

#### **5.3.2.2 Family context**

Parent's health behaviours and life style choices greatly influence the health status of their young children. For example, parenting practices such as feeding and toothbrushing are central to the development of ECC.<sup>6, 55</sup> In addition, children's dietary habits evolve within

the context of the family.<sup>187</sup> Some studies examining parental beliefs, attitudes, and the resulting health behaviours have been undertaken with little acknowledgement of the family context (the influence of and the interaction among family members) and social influences (e.g. culture).<sup>107, 188</sup> This type of approach results in an incomplete understanding of how poor oral health occurs in young children.<sup>183</sup> Therefore, in order to improve children's oral health we need a better understanding of parent's beliefs and attitudes operationalized within the context of the family and the surrounding external environment.

In the present study, although we explored parent's own perceptions of oral health and their beliefs about baby teeth (discussed in 5.3.1.1) parents also told us about the impact of other family members (siblings and grandparents) as well. Certainly, the influence of other family members on children's oral health practices has been reported by previous studies.<sup>79, 186</sup> For example, in a qualitative study conducted in a multicultural community, parents commonly reported their child receiving treats from all members of the extended family. Parents felt it would be inappropriate to ask other family members to not give their children snacks.<sup>79</sup> Therefore, since children's "snacking" habits are often acquired within the "extended" family context, changing such behaviour is a challenge. Clearly, family interventions need to go beyond "mom and dad."

Children's food preferences and dietary patterns may also be shaped by interactions with peers and siblings. In one of the few studies that has assessed this possibility, Birch found that children aged 2-5 years changed their food preferences and consumed more of a non-preferred food, when repeatedly exposed to children with preferences differing from their own. That is, children changed their behaviours to

coincide with those of their peers. The effect of peers was still evident 1-8 weeks after the interventions, thus suggesting long-term effects on preference.<sup>189</sup> Again, the need for oral health promotion interventions with a family, rather than a “parent-only” focus is reinforced.

In addition, parents’ past behaviours may influence their attitudes towards adopting and maintaining new healthy behaviours. Parent’s previous practices regarding their child’s dental health were explored around the three themes:

- 4) Feeding practices
- 5) Oral hygiene
- 6) First dental visit

#### **5.3.2.2.1 Feeding practices**

A consistent and significant association has been found between a child’s inappropriate eating and drinking habits and ECC.<sup>9, 10</sup> Despite awareness of this association, some parents persist with these dietary practices. One hypothesis to explain this behaviour is that a common dietary practice like prolonged breast- or bottle-feeding is closely linked to the mother-child interaction.<sup>190</sup> Indeed, in our study, some mothers appeared to be “overly sensitive” to their child’s needs. They talked about the breast or bottle as a “security” for their child. Although, they were aware that their child no longer needed the nutrients from the breast or bottle for health, they persisted with the practice. Persistence in breast or bottle feeding may also related to mother’s resistance to her baby’s growing up, called by Stevens and Freeman “regressive mothering”.<sup>190</sup> Perhaps, stopping breastfeeding for these mothers means more than withdrawal of milk or a change of diet. It is a disconnection from their child, letting him/her to be independent and separated from them. Another

behaviour identified in our mothers was the use of breast or bottle feeding as a pacifier for their child. This behavioural characteristic has been termed "convenience mothering."<sup>190</sup> These mothers found the convenient use of the breast or bottle an immediate solution to their child's or their own frustrations and sleep problems.<sup>190</sup>

Sugary food is another recognised risk factor for ECC.<sup>191</sup> Parents face complex challenges in managing their child's daily diet. They influence their children's food preferences and intake patterns by the foods they make available and accessible to the child as well as their own eating style (food modelling).<sup>192</sup> In addition, some parents in our study admitted using sweets to pacify or reward their child. Giving sweets to children as reward is a ubiquitous practice worldwide.<sup>193, 194</sup> Furthermore, similar to previous reports,<sup>195</sup> some of our parents also talked about the food preferences of their child as being an important consideration. If given a choice, children tend to prefer foods high in sugar.<sup>192</sup> Permissiveness with children's eating habits can negatively affect a child's oral health and have other health consequences like obesity. Parental confusion about healthy nutrition, adherence to cultural dietary and using sweets as rewards may lead to poor eating practices over the child's life time.

#### **5.3.2.2.2 Oral hygiene**

Toothbrushing with fluoride dentifrice is a primary preventive oral health behaviour. Parents in our study had good intentions to properly brush their child's teeth and knew the value of toothbrushing. Although almost all parents said that they had started to brush their child's teeth before age 2, the majority of children were eventually left to clean their teeth by themselves because of the "child's resistance." While onset of brushing a child's teeth has been associated with the prevalence of caries in the primary dentition,<sup>48</sup> children

who brush their own teeth without help have been shown to be more likely to develop dental caries than those who sometimes, or always, have their teeth brushed by an adult.<sup>115</sup>

The effectiveness of parental toothbrushing itself was also another issue that arose from the interviews. Some parents in our study admitted that their technique became much better after having one session of “hands-on” training from a dental professional. In a recent pilot study, the toothbrushing behaviour of parents and toddlers was investigated by analysis of toothbrushing sessions videotaped in families’ homes. Although the feedback from parents indicated that they were generally confident that the sessions had been effective in achieving clean teeth, their effectiveness was measured as poor by the investigators.<sup>196</sup> In another study, a single dental health education session and toothbrushing instruction with mothers resulted in approximately a 25% reduction in mutans streptococci infection in young children.<sup>197</sup> Our findings confirm that parents not only should be encouraged to brush young children’s teeth from an early age, but, in addition, they need training and support to develop proper skills. Dental professionals need to provide coaching, not just information.

#### **5.3.2.2.3 First dental visit**

For a variety of reasons, many parents did not consult a dentist at the currently recommended age for their child. Furthermore, for those parents who took their toddler to a dentist, their dentist frequently postponed referral to a specialist practice until a more advanced stage of disease. This finding suggests that promotion of an early dental visit is an important strategy that needs to be emphasized by all health care professionals who work with young children. Paediatricians and family physicians should screen children for risk factors and early signs of ECC. Fortunately, both the Canadian Paediatric Society and

American Academy of Paediatrics have recently updated their guidelines to say that all infants should receive oral health risk assessments by 6 months of age and infants at higher risk of early dental caries should be referred to a dentist no later than six months after the eruption of first tooth. However, despite these new guidelines many parents commented about their difficulties finding a dentist to see a child under 3 years of age. Perhaps, developing a "first dental visit" program that covers the cost of a dental check up for all children less than 2 years old will facilitate early dental check-ups. In addition, dental professionals in training need to develop skills in screening the very young child.

### **5.3.2.3 Parental strategies**

Although family is the basic social context in which health behaviours are learned and performed, we identified parent's individual skills in parenting-related problem solving, health information seeking, goal-attaining, and decision making as the foundation of the process of health behaviour change. Parental skills that support healthy behaviours have received little attention in the child dental literature, yet these skills are the critical element of family health care. In the present study, in addition to parent's dental beliefs and attitudes, we identified other characteristics of parents that affect their adoption and maintenance of healthy behaviours. I will discuss the two characteristics that seemed to have the greatest influence on parents, i.e. parental self-efficacy and readiness to change.

#### **5.3.2.3.1 Parental self-efficacy**

Adoption of and persistence with healthy behaviours are known to be significantly associated with parents' perception of actually being able to cope with the care of their child's teeth, i.e. their self-efficacy.<sup>80</sup> For example in our study, although most parents were positive about the *value* of toothbrushing and had intentions to brush their child's



teeth regularly, some parents had little belief in their *ability* to implement the behaviour. The behaviour was unlikely to endure over time, despite good intentions. Similarly, parents' perceived ability to control their child's snacking was lower than their perception of the importance of a healthy diet. These perceptions seemed to be related to parent's own poor childhood dental care, inadequate or incorrect knowledge, limited family income, and external influences (for example, access to snack foods). Our findings are similar to those of an international study where parental self-efficacy was reported as an important factor affecting parent's control over their child's sugar snacking and toothbrushing.<sup>80</sup>

Parents' feelings of self-efficacy are also the best predictor of family discipline style.<sup>198</sup> A lack of self-efficacy results in either parental over-reactivity (harsh discipline) or laxness (permissive and inconsistent discipline). Developing interventions that increase parental self-efficacy by providing parents with the skills to manage specific child's behaviour problems may, in turn, help them to more effectively look after their child's dental health. Dental professionals can also help parents to improve their self-efficacy by developing skills in parent-based oral health counselling strategies like Motivational Interviewing.<sup>133</sup> Parents need our encouragement and support to help them "do the right thing."

#### **5.3.2.3.2 Parental readiness to change**

While behaviour 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 behaviour.<sup>125</sup> To explore why many parents fail to adequately protect their

children from the sun, Turner and Mermelstein (2005) assessed sun-related knowledge, stage of change, and psychosocial characteristics of 391 parents of pre-school aged children in a survey. They demonstrated that parents in the earlier stages of change perceived more barriers to child sun protection, had more positive beliefs about children's sun exposure, perceived their child to be less susceptible to sun damage, and had lower self-efficacy for child sun protection than did parents in later stages of change. They identified parent's readiness to change as a predictor of child sun protection.<sup>199</sup>

Similarly in our study, despite the initial enthusiasm for change and immediate improvement of parents' and their child's oral health behaviours, it was only those families who were furthest along the stages of change continuum who maintained positive behaviours over time. Thus, parental readiness to change was an important determinant of the maintenance of health-promoting behaviours and of changing existing unhealthy behaviours. Our parents differed on a number of dimensions related to how they perceived the "costs and benefits" of behaviour change for their child's oral health and their ability to establish long-term change. Some parents mostly in the "relapse" group appeared to be at the earlier stages of change (pre-contemplation or contemplation stage). They had not yet resolved their ambivalence about the costs and benefits of behaviour change and had a lower sense of self-efficacy than other parents. On the contrary, most "no-relapse" parents seemed to be in the preparation or action stages of change. They saw the benefits of behaviour change and considered themselves to be capable of protecting their child from caries relapse. All parents talked about similar barriers to change; however, parents in the "no-relapse" group seemed to be more determined to find a way to dismantle the barriers and were more receptive to receive support from others.

A parent's readiness to change may be reflective their parenting style. Parents develop different styles to cope with the struggles of parenting. Most parents use a combination of styles; however, one style usually predominates.<sup>140</sup> An authoritative parenting style has shown to be one of the most consistent predictors of healthy family behaviours.<sup>144</sup> In the present study, some parents mostly in the "no-relapse" group fostered a more authoritative style to promote their child's oral health compared to the "relapse" families. However, controlling a child's eating habits 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 not only dental, but also the general health of a child.<sup>200</sup>

Although action cues play a major role in behaviour change, barriers may obstruct the path for action.<sup>201</sup> In our study, while the dental GA experience influenced parents in different ways to immediately implement healthy behaviours, some were quite overwhelmed by the difficulties of change. Parents expressed different levels of attention and interest in their child's oral health; however, repeated challenges to doing the "right thing" were raised by both the "relapse" and "no-relapse" group. Hart *et al.* (2003) used qualitative methods to investigate the barriers and benefits perceived by parents in the provision of a healthy diet and adequate exercise for their primary school children. Despite disparities between SES groups regarding the role of environment, peers, and parent's preferences or limited knowledge, evidence of subconscious parental barriers in the form of poor role modelling, inappropriate health beliefs, parental resistance to change were identified in all groups. The child's own preferences, cost, and time were also reported as important barriers to healthy behaviours.<sup>202</sup> Similarly, in our study, child's temperament was perceived as the biggest barrier to success by all parents. In addition,

lack of time and availability of the mother and poor understanding by other caregivers (grandparents or babysitters) were barriers to healthy behaviours. Socioeconomic status and the influence of the media were also challenges for some of our parents.

Parents emphasized that they needed more support from dental and non-dental professionals in order to handle these challenges and maintain their new healthy behaviours. Furthermore, parents complained about receiving "inconsistent" messages from family members, friends, and even professionals. They suggested that health professionals like community health nurses and family physicians should be more sensitive to oral health issues when providing information for expectant and new parents. They also remarked on the importance of a reminder letter or telephone call to encourage them to attend for an early dental visit. Encouragement by "non-dental" health professionals like physicians and nurses may improve parents' compliance to an early dental visit and regular check ups.

#### **5.4 Implications for health professionals**

Our study identified some of the complex issues surrounding changing parental behaviours. It revealed some of the barriers that, from the parents' perspective, seemed to initially outweigh the benefits of change. These findings suggest health promotion interventions should be focused on enhancing motivation, and hence facilitating change in parent's behaviours.

To translate knowledge from this research into some practical suggestions for dental professionals, a few “tips”<sup>1</sup> are listed:

1. Children who may require extractions during the GA need advance preparation for the “loss” of their teeth.
2. The possibility of being “cavity-free” for life needs reinforcing, as does the relationship between healthy baby teeth and healthy adult teeth.
3. In order to facilitate an early dental visits, dental professionals need to develop skills in doing an oral health screening for the very young child. A reminder letter or telephone call from health professionals may encourage parents to bring their child for an early dental visit.
4. Parents not only should be encouraged to brush young children’s teeth from an early age, but, in addition, they need training to develop proper skills. Dental professionals need to provide “hands-on demonstrations.”
5. Parents need our encouragement and support, not just information, to help them “*do the right thing*”. By improving our skills in parent-based oral health counselling strategies, we can improve parent’s sense of self-efficacy.
6. Parents are at different stages of change; therefore, our counselling should be individually tailored to a parent’s stage of change rather given with the expectation that all parents are ready for action-oriented strategies.

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<sup>1</sup> These “tips” were disseminated to the dental community by publication in CONNECTIONS, the newsletter of the BC Dental Association<sup>203</sup>. Amin M, Harrison R. Talking to parents begins with listening! CONNECTIONS, Newsletter of the British Columbia Dental Association 2006.

In addition, parents seemed to be requesting a family-centered, supportive, brief counselling approach rather than the standard "lecture" or advice from professionals which most parents found to be both "complicated" and "unrealistic."

Furthermore, there is a need to recognize that children's oral health is a serious health condition that requires the concerted efforts of all primary health professionals working with children. To manage the conflicting information that parents currently experience, healthcare professionals need to become actively involved in efforts to promote young children's oral health. Clear and consistent oral health information as well as an integrated and shared approach to preventing dental caries in young children should be developed.

## **5.5 Future directions**

### **5.5.1 Cross-cultural exploration**

According to Statistic Canada, Vancouver has the second largest population of visible minorities in Canada (37%).<sup>204</sup> Therefore, dental professionals need to better understand how to deliver culturally-sensitive dental counselling to cultural minorities and to improve their communication with parents by understanding their concerns. About half of the visible minority population in Vancouver is of Chinese origin. Not surprisingly, we had nine Chinese families in our study. In the analysis of information, we came across three main issues that seemed to be different between Chinese and non-Chinese families. First of all, our Chinese families were much more aware of the bacterial contribution to the aetiology of caries compared to the non-Chinese families. In addition, they were also more permissive about their child's food choices and were more reliant on professionals rather than themselves to maintain their child's dental health. These differences between the

beliefs and attitudes of Chinese and non-Chinese families indicate the need for further investigations into parental beliefs and attitudes “cross-culturally.”

### **5.5.2 Motivational Interviewing Interventions**

Motivational Interviewing<sup>1</sup> (MI) is a method for enhancing parents’ intrinsic motivation to change by exploring and resolving their ambivalence. Motivational Interviewing may eventually change parents’ attitudes, their perceptions of barriers and available supports, and their feelings of self-efficacy, which in turn, may move them along the stages of change in a positive direction. This approach is also congruent with principles of family-centered care, recognizing that the family is the “expert” regarding 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.

Our findings suggest that developing positive “parenting skills” is an important factor in the process of parental behaviour change. Therefore, parent-centered strategies should be developed to improve parenting skills and to enhance parental self-efficacy. Motivational Interviewing, one such “parent-centered” approach, seems to be a promising behavioural intervention that dental professionals should consider to enhance the effectiveness of their preventive strategies. In a previous study in British Columbia, the effect of an MI counselling visit was compared with that of traditional health education for 240 mothers of six to 18 month-old infants in a Punjabi-speaking community setting.<sup>133,</sup>

<sup>134</sup> Two year results demonstrated a significant reduction of new carious lesions in the

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<sup>1</sup> Motivational interviewing is a directive, client-centered counseling style for eliciting behaviour change by helping clients to explore and resolve ambivalence. Compared with nondirective counseling, it is more focused and goal-directed. The examination and resolution of ambivalence is its central purpose, and the counselor is intentionally directive in pursuing this goal.

intervention or MI group. Greater compliance with recommended fluoride varnish treatment regimens was also observed in families who received MI counselling compared with families who received traditional education.

MI counselling was used successfully in a cross cultural community setting, but the question is how feasible this approach is in a private practice setting. We explored the views of our three dentists on the effectiveness of the traditional preventive counselling that they provided for parents as a routine practice. They repeatedly expressed their frustration regarding their failure in helping parents change their behaviours. Therefore, the feasibility and the cost-effectiveness of an MI intervention in private dental practice warrants further investigation.

### **5.5.3 Readiness assessment instrument**

Parent's readiness to change was also identified as an important component in the "package" of parental strategies that lead to parental change of behaviour. Therefore, simple, user-friendly methods to assess parental readiness need to be developed so that dental professionals can include an assessment of readiness in their interactions with parents. Tillis *et al.* (2003) applied the Transtheoretical Model to oral self-care behavioural change in order to develop instruments to identify stages of change and the decisional balance of a group of adults. The instruments were tested and shown to be valid and reliable based on the oral self-care behaviours recorded in this study.<sup>132</sup> However, the proposed instruments only assessed an individual's readiness to change related to their own oral health and not to their child's health.

Weinstein and Riedy (2001) have developed another scale of Readiness Assessment of Parents concerning Infant Dental Decay (RAPIDD) as a measure of



parental readiness to change children's dental behaviours. The instrument includes 38 items based on four constructs: 1) openness to health information, 2) valuing dental health, 3) convenience/difficulty, and 4) child permissiveness. The RAPIDD scale was found to be reliable and valid with specific parental behaviours for a group of 6-to-36 month old children.<sup>205</sup> However, the large number of items and the complicated analysis means the RAPIDD is not yet appropriate for easy use in a private office or public health setting.

In the present study, our participants were families who had experienced one of the most “emotional” episodes of their life, as described by many of the parents in both groups. Therefore, we identified some new and different elements as constructs of parental readiness to change (**Figure 4.1**). As a result, we need to develop a new instrument or modify the RAPIDD scale to include the components of our emerged model. Once the instrument is developed, it needs to be tested for validity and reliability as well for feasibility and ease of administration in both public and private practice settings.

#### **5.5.4 Further qualitative and quantitative inquiry**

This qualitative research revealed unforeseen findings, raised unexpected questions, and identified topics that we might not have otherwise considered. The information gathered helped us to formulate a conceptual model that reflected the beliefs and the needs of the parents. An area of further study will be to interview parents whose children have been treated for extensive dental caries to validate and test our emerged theory. In addition to validating our model by further interviews, we also need to translate our findings into quantitative survey instruments in order to hear from a much larger group of parents. Integrating both qualitative and quantitative methods will eventually provide a more complete picture of the complexities involved in stimulating parental behaviour change.

## 5.6 Conclusions

A qualitative approach provided unique insights into parents' beliefs and behaviours related to their child's oral health. This research also identified some of the barriers and the challenges parents faced in adopting and maintaining dentally-healthy behaviours in the long term.

Parents reported varying levels of anxiety during the GA. They expressed their emotions as "fear", "worry", and "concern". While some parents felt "guilty" and struggled to accept this mode of treatment for their child, others felt "blameless" and were convinced that a GA is "preferable" and superior to conventional treatment. Overall, the GA dental experience had enough of an impact to immediately motivate parents to consider changing their behaviours related to their child's dental health. Furthermore, despite having gaps in dental knowledge prior to the GA, parents reported confidence in the knowledge acquired as result of the GA experience. They acknowledged their concern regarding dental decay and expressed a positive attitude towards maintaining healthy primary teeth. Self-reported improvements in dental health practices shortly after the GA were generally reported. However, difficulty and only partial compliance in following recommendations were frequently mentioned by most parents.

The emotional reaction to the GA reported by most parents suggested that adoption of healthy behaviours shortly after the GA was influenced by this "negative" experience. The GA experience did not appear to affect long-term preventive behaviours for most parents; therefore, the "early" healthy behaviours did not maintain over time for all parents. This study identified social influences, family context, and parental strategies as the key determinants of parental behaviour change. Parental strategies were recognized as

the core category of the model that determined whether parents engaged in preventive methods and maintained the acquired healthy behaviours over time.

**CHAPTER VI**  
**BIBLIOGRAPHY**

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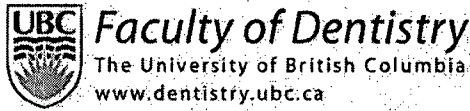
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## **CHAPTER VII**

## **APPENDICES**

## **Appendix 7-2-1 (letter of initial contact, Cohort A)**



Department of Oral Health Sciences  
2199 Wesbrook Mall  
Vancouver, BC, Canada V6T 1Z3

### **Dental Treatment Under General Anesthesia: "Listening to Parents" (Cohort A)**

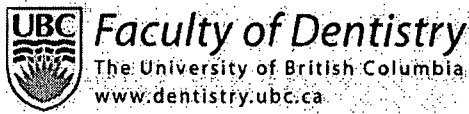
#### **Dear Parents or Caregivers:**

My name is Dr. Maryam Amin. As part of my studies in the Faculty of Dentistry at the University of British Columbia, I am doing research on preventing tooth decay in young children. We are hoping to find better ways to lower a child's risk of getting more cavities. I am asking you to be part of this research because one of the dentists of the Monarch Pediatric Dental Center will be fixing your child's teeth while he/she is asleep (under general anesthetic).

If you agree to participate in this study, you will have one interview. The interview will be scheduled at the same time as your child's check-up after he/she has had the dental surgery. This check-up at Monarch is usually about 1 - 2 weeks after the surgery. If the check-up appointment is not convenient for you, I can schedule the interview at Monarch at a better time for you.

The interview will be a series of questions about your thoughts and feelings about your own dental experiences, about how you think cavities can be prevented, and how you felt about your child's dental treatment and the

## Appendix 7-2-1 (letter of initial contact, Cohort B)



Department of Oral Health Sciences  
2199 Wesbrook Mall  
Vancouver, BC, Canada V6T 1Z3

### **Dental Treatment Under General Anesthesia: "Listening to Parents" (Cohort B)**

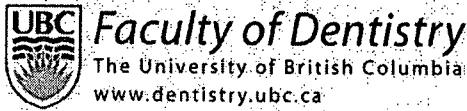
#### **Dear Parents or Caregivers:**

My name is Dr. Maryam Amin. As part of my studies in the Faculty of Dentistry at the University of British Columbia, I am doing research on preventing tooth decay in young children. We are hoping to find better ways to lower a child's risk of getting more cavities. I am asking you to be part of this research because one of the dentists of the Monarch Pediatric Dental Center has fixed your child's teeth while he/she was asleep (under general anesthetic).

If you agree to participate in this study, you will have one or two interviews. The interviews will be scheduled at a time that is convenient for you.

The interview will be a series of questions about your thoughts and feelings about your own dental experiences, about how you think cavities can be prevented, and how you felt about your child's dental treatment and the general anesthetic. The interview will last about 60-90 minutes, or as long

## Appendix 7-2-2 (Contact Form)



Department of Oral Health Sciences  
2199 Wesbrook Mall  
Vancouver, BC, Canada V6T 1Z3

### **Dental Treatment Under General Anesthesia: "Listening to Parents"**

I have received written information about the above-named project, and am interested in participating. I would like the project investigator, Dr. Amin, to contact me with further details about my participation. My contact information is given below:

Date of child's general anesthesia dental treatment: \_\_\_\_\_

Child's name: \_\_\_\_\_

Parent's name: \_\_\_\_\_

Contact information for parent:

Preferred telephone number \_\_\_\_\_

Preferred time of day to be called at this telephone number:

\_\_\_\_\_

Additional contact information: \_\_\_\_\_

\_\_\_\_\_

Dr. Amin will call me in the next few days to answer my questions about the project, and make further arrangements for my participation.

**Purpose:**

You are being asked to be part of this research project because your child will be having his/her teeth fixed, while he/she is asleep, by one of the dentists of the Monarch Pediatric Dental Center.

The purpose of the study is to better understand tooth decay in young children and how to prevent it, and to find good ways to lower a child's risk of getting more cavities. The work on this study by Dr. Amin, one of the co-investigators, is also part of the requirements for a university course at UBC and will be part of her PhD thesis.

**Study Procedures:**

You are being asked to participate in one interview that will be scheduled at the same time as your child's check-up after he/she has had the dental surgery. This appointment at Monarch is usually about 1- 2 weeks after the surgery. If the check-up appointment is not convenient time for you for the interview, it will be scheduled at Monarch at a better time.

The interview will be a series of questions about your thoughts and feelings about your own dental experiences, about how you think cavities can be prevented, and how you felt about your child's dental treatment and the general anesthetic. The interview will last about 60-90 minutes or as long as you need to explain your experiences and opinions. A private room away from the main Monarch dental clinic will be used for the interview. Each interview will be tape-recorded, and your comments will be typed. You can read the typed version of the interview if you wish. The tape-recorder will be turned off at any time that you ask to do so.

**Consent:**

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty. Your withdrawal will not affect the services that any of your family receives from the Monarch Pediatric Dental Group. You may also refuse to answer any questions.

Your signature below indicates that you have received a copy of this consent form for your own records.

Your signature indicates that you consent to participate in this study and you are willing to have your interview conversation audio-taped.

---

**Subject Signature**

---

**Date**

---

**Printed Name**

**Purpose:**

With our thanks for your previous participation in this project, you are invited to do a second interview. Your child had his/her teeth fixed under general anesthesia by one of the dentists of the Monarch Pediatric Dental Center one year ago, and we would like to hear more from you now.

The purpose of the study is to better understand tooth decay in young children and how to prevent it, and to find good ways to lower a child's risk of getting more cavities. The work in this study by Dr. Amin, one of the co-investigators, will be part of her PhD thesis.

**Study Procedures:**

You are being asked to participate in a second interview that will be scheduled at a convenient time for you. The interview will be a series of questions about your thoughts and feelings about your child's dental health and how she/he has been doing since the last interview. The interview will last about 60-90 minutes or as long as you need to explain your experiences and opinions. A private room away from the main Monarch dental clinic will be used for the interview. Each interview will be tape-recorded, and your comments will be typed. You can read the typed version of the interview if you wish. The tape-recorder will be turned off at any time that you ask to do so.

**Confidentiality:**

Your identity will not be revealed in any reports arising from the interviews. Only code number known to the investigators will identify all documents. Tapes and transcripts of interviews will be kept in a locked filing cabinet. Security of any information kept on a computer hard drive will be maintained by password access.

**Consent:**

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty. Your withdrawal will not affect the services that any of your family receives from the Monarch Pediatric Dental Group. You may also refuse to answer any questions.

Your signature below indicates that you have received a copy of this consent form for your own records.

Your signature indicates that you consent to participate in this study and you are willing to have your interview conversation audio-taped.

---

**Subject Signature**

**Date**

---

**Printed Name**



**Purpose:**

You are being asked to be part of this research project because, 6 months ago, your child had his/her teeth fixed while he/she was asleep, at the Monarch Pediatric Dental Center. The purpose of the study is to better understand tooth decay in young children and how to prevent it, and to find good ways to lower a child's risk of getting more cavities. The work on this study by Dr. Amin, one of the co-investigators, will be part of her PhD thesis.

**Study Procedures:**

You are being asked to participate in this interview and, possibly, a second interview a year from now. The interviews will be scheduled at a time that is convenient for you. The interviews will be a series of questions about your thoughts and feelings about your own dental experiences, about how you think cavities can be prevented, and how you felt about your child's dental treatment and the general anesthetic. The interviews will last about 60-90 minutes, or as long as you need to explain your experiences and give us your opinions. A private room away from the main Monarch dental clinic will be used for the interview. Each interview will be tape-recorded, and your comments will be typed. You can read the typed version of the interview, if you wish. The tape-recorder will be turned off at any time that you ask to do so.

**Confidentiality:**

Your identity will not be revealed in any reports arising from the interviews. Only code number known to the investigators will identify all documents. Tapes and transcripts of interviews will be kept in a locked filing cabinet.

**Consent:**

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty. Your withdrawal will not affect the services that any of your family receives from the Monarch Pediatric Dental Group. You may also refuse to answer any questions.

Your signature below indicates that you have received a copy of this consent form for your own records.

Your signature indicates that you consent to participate in this study and you are willing to have your interview conversations audio-taped.

\_\_\_\_\_  
**Subject Signature**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Printed Name**

**Purpose:**

You are being asked to be interviewed because we completed our interviews with a group of parents of children who are your clinic patients and were treated under general anesthesia at Monarch Pediatric Dental Center. The purpose of the study is to explore 1) parents' beliefs about dental health, 2) parents' experiences of their child's dental rehabilitation under GA and their perception of the impact of this treatment on their child, and 3) parents' readiness to adopt and maintain preventive behaviours following their child's GA. The work on this study by Dr. Amin, one of the co-investigators, will be part of her PhD thesis.

**Study Procedures:**

You are being asked to participate in an individual interview. The interviews will be scheduled at a time that is convenient for you. The purpose of this interview is to explore your views on our findings from the analysis of interviews with the parents, as well as your thoughts on the model that we have developed based on the interviews. We want to see how the model corresponds to your experiences or "beliefs". In addition, we would like to observe the type of preventive teaching and counselling given to parents by Monarch professional staff to see how it compares with parents' recollections of what occurred. The interviews will last about 45-60 minutes, or as long as you need to explain your experiences and give us your opinions. Each interview will be tape-recorded, and your comments will be typed. You can read the typed version of the interview, if you wish. The tape-recorder will be turned off at any time that you ask to do so.

**Consent:**

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty. Your withdrawal will not affect the services that any of your family receives from the Monarch Pediatric Dental Group. You may also refuse to answer any questions.

Your signature below indicates that you have received a copy of this consent form for your own records.

Your signature indicates that you consent to participate in this study and you are willing to have your interview conversations audio-taped.

---

**Subject Signature**

---

**Date**

---

**Printed Name**

## Appendix 7-3 (Questionnaire, Cohort A1)

### Monarch Dental Clinic Project

Demographic Information	
1. Child's date of birth:	2. Mother's date of birth:
month / day / year	month / day / year
3. Child's sex: <input type="checkbox"/> boy <input type="checkbox"/> girl	
4. Since birth has the child lived anywhere else?	
<input type="checkbox"/> no	
<input type="checkbox"/> yes, list which city and time at each location:	
5. What is the highest level of education that the mother has completed? ( <i>check one</i> ) <input type="checkbox"/>	
elementary school <input type="checkbox"/> some high school <input type="checkbox"/> completed high school	
<input type="checkbox"/> college or vocational school	
6. How many people live in the child's household?	
<input type="text"/> Adults <input type="text"/> Children	
7. What is the birth order of your child?	
<input type="checkbox"/> First <input type="checkbox"/> Second <input type="checkbox"/> Third <input type="checkbox"/> Fourth <input type="checkbox"/> Fifth or more	
Child Feeding Information	
1. Is the child breast-fed now? <input type="checkbox"/> yes <input type="checkbox"/> no	
If no, how old was the child when the breast-feeding was stopped? _____ months old	
2. Is the child using a bottle now? <input type="checkbox"/> yes <input type="checkbox"/> no	
If no, how old was the child when the bottle-feeding was stopped? _____ months old	
3. What is/was <b>most often</b> contained in the bottle? ( <i>check only one</i> )	
<input type="checkbox"/> milk <input type="checkbox"/> juice/pop <input type="checkbox"/> water <input type="checkbox"/> other _____	
<input type="checkbox"/> not applicable	

4. How often did/ does your child nap or sleep with a bottle containing something other than water?

☐ never ☐ at nap time only ☐ at night time only ☐ at nap time and night time.

5. Do you (or did you) bottle feed your child when he/she wakes up at night?

☐ no ☐ yes

6. On average, how often does (or did) your child walk around with a bottle or sippy cup containing something other than water during the day?

☐ never ☐ once a day ☐ once a week

### Dental History

1- How old was the child when his/her teeth first appeared?  months

2- At what age did an adult first clean your child's teeth? ☐ before age 1 ☐  
before age 2 ☐ before age 3 ☐ before age 4

3- Who brushes your child's teeth?

☐ child ☐ mother ☐ father ☐ others

4- Have/had you taken your child to the dentist before coming to this office (Monarch)?

☐ no ☐ yes

5- If yes, how many times has the child gone to the dentist before coming to Monarch

☐ once ☐ twice ☐ three times ☐ more than three

6- What was the child's age when she/he first went to a dentist?  months

7- What was the reason for the first dental visit?

☐ regular check-up ☐ black spot ☐ dental decay ☐ pain

8- Has your child ever had following problems before the surgery?

- ☐ Sensitive teeth to hot and cold
- ☐ Mouth/tooth pain
- ☐ Problem in eating
- ☐ Waking up through the night because of tooth pain

9- Have the child's sister/brother ever put to sleep to have their teeth fixed? ☐ no ☐ yes

## Appendix 7-3 (Questionnaire, Cohort A2)

### Monarch Dental Clinic Project

#### Dental Visits

1- In the last 12 months have you taken \_\_\_\_\_ (child's name) to a dentist?

☐ no ☐ yes

2- If yes, Where? ☐ Monarch ☐ Family Dentist

3- How many times? ☐ once ☐ twice ☐ three times ☐ more than three

4- What was the reason for the visits? (*Check all that apply*)

☐ Cleaning and fluoride

☐ regular check-up only, no obvious problems with teeth

☐ parent noticed a problem on child's mouth

☐ child complained of a problem

☐ other (please explain) \_\_\_\_\_

5- What was done for your child?

☐ oral exam

☐ taking radiograph

☐ cleaning and fluoride therapy

☐ filling

☐ other (please explain) \_\_\_\_\_

#### Brushing

6- Who brushes your child's teeth most of the time? (*Check one*)

☐ child ☐ mother ☐ father ☐ mother/father together ☐ others

7- How many times a day?

☐ Less than once a day ☐ once ☐ twice ☐ three times

8- What kind of toothpaste?

☐ fluoridated ☐ no fluoridated ☐ I don't know

9- Does she/he brush more frequently since her/his teeth fixed? ☐ no ☐ yes

#### Diet

10- How many "sit down" meals does your child have each day?

11- How many times does she/he have snacks between the meals?

## Appendix 7-3 (Questionnaire, Cohort B)

### Monarch Dental Clinic Project

Demographic Information	
month / day / year	month / day / year
1. Child's date of birth:	2. Mother's date of birth:
3. Child's sex: <input type="checkbox"/> boy <input type="checkbox"/> girl	
4. Since birth has the child lived anywhere else?	
<input type="checkbox"/> no	
<input type="checkbox"/> yes, list which city, country and time at each location:	
5. What is the highest level of education that child's mother has completed? ( <i>check one</i> )	
<input type="checkbox"/> elementary school <input type="checkbox"/> some high school <input type="checkbox"/> completed high school	
<input type="checkbox"/> college or vocational school	
6. How many people live in child's household?	<input type="text"/> Adults <input type="text"/> Children
7. What is the birth order of your child? <input type="checkbox"/> First <input type="checkbox"/> Second <input type="checkbox"/> Third <input type="checkbox"/> Fourth <input type="checkbox"/> Fifth or more	
Child Feeding Information	
1. Is your child breast-fed now? <input type="checkbox"/> yes <input type="checkbox"/> no	
If no, how old was the child when the breast-feeding was stopped? _____ months old	
2. Is your child using a bottle now? <input type="checkbox"/> yes <input type="checkbox"/> no	
If no, how old was the child when the bottle-feeding was stopped? _____ months old	
3. What is/was <b>most often</b> contained in the bottle? ( <i>check only one</i> )	
<input type="checkbox"/> milk <input type="checkbox"/> juice <input type="checkbox"/> pop <input type="checkbox"/> water <input type="text"/> other	
<input type="checkbox"/> not applicable	
4. How often did/ does your child nap or sleep with a bottle containing something other than water?	
<input type="checkbox"/> never <input type="checkbox"/> at nap time only <input type="checkbox"/> at night time only <input type="checkbox"/> at nap time and night time.	



5. Do you (or did you) bottle feed your child when he/she wakes up at night? ☐ no ☐ yes

6. On average, how often does (or did) your child walk around with a bottle or sippy cup containing something other than water during the day?

☐ never ☐ once a day ☐ once a week

### Dental History

1- How old was your child when his/her teeth first appeared?  months

2- At what age, did an **adult** start cleaning your child's teeth regularly (at least once per day)?

☐ age 1 ☐ age 2 ☐ age 3 ☐ age 4

3- Who brushes your child's teeth most of the time? (*Check one*)

☐ child ☐ mother ☐ father ☐ mother/father together ☐ others

4- Have/had you taken your child to the dentist before coming to this office (Monarch)?

☐ no ☐ yes

5- If yes, how many times has the child gone to the dentist before coming to Monarch?

☐ once ☐ twice ☐ three times ☐ more than three

6- What was the child's age when she/he **first** went to a dentist?  years

7- What was the reason for this **first** dental visit? (*Check all that apply*)

☐ regular check-up only, no obvious problems with teeth

☐ parent noticed "black spots" on child's teeth

☐ parent knew that child had a cavity in a tooth

☐ child complained of tooth pain

☐ other (please explain) \_\_\_\_\_

8- Did your child have any of the following problems before the surgery? (*Check all that apply*)

☐ Teeth sensitive to hot or cold

☐ Pain in mouth or teeth

☐ Avoidance of certain foods because of problems with mouth

☐ Waking up during the night or not going to sleep because of tooth pain

☐ Not allowing teeth to be brushed because teeth hurt

☐ Unhappiness with appearance of teeth

9- Has a sister or brother of your child been put to sleep to have her/his teeth fixed?

☐ no ☐ yes

## **Appendix 7-4 (interview guide, Cohort A1)**

### **Interview Guide (Cohort A1)**

#### **Dental treatment under general anesthesia: "Listening to parents"**

A qualitative look at parents' beliefs and understandings of their child's dental experience

#### **Parents' dental health experiences and stress:**

- 1- *Perceptions of dental health:* "Tell me about your own teeth. Do you have any problems or worries/concerns about your own teeth?"
- 2- *Parent's dental experiences:* "Tell me about your experiences at the dentist. Think about the last time *you* were a patient at a dental office; tell me about it. What did you like? What did you dislike? What would have made the experience better for you?"
- 3- *Parent's stress:* "On a scale from 1 to 10, what is the stress level in your life this month? Can you tell me what is the main source of your stress?" Can you define or give an example of stress to the parents?"

#### **Child's dental history:**

- 4- *Baby teeth:* "Tell me what you know about baby teeth. Some parents think baby teeth are important; others do not. What do you believe? Where did your belief come from?"
- 5- *Routine care/emergency:* "Have/had you taken \_\_\_\_\_(child's name) to the dentist before coming to this office (Monarch)? What was the reason that you went? Tell me what happened at the previous dental office?"
- 6- *Parent's thoughts on general anesthesia (GA):* "When did you first know that \_\_\_\_\_(child's name) needed a GA for dental treatment?" Tell me what you felt or thought when you heard about the need for a GA?"

### **Getting dental treatment:**

- 7- *Wait-time:* "How long did you wait to get the treatment at Monarch? What do you think about this wait-time?" (Too long, okay, no problem??)
- 8- *The GA appointment:* "Try to remember when \_\_\_\_\_(child's name) was asleep and being worked on by the dentist. Can you tell us what you were thinking and feeling during this time?"

### **After surgery:**

- 9- *Recovery and post-op:* "How did \_\_\_\_\_(child's name) do after the dental work".
- 10- *Quality of life outcomes:* "Did \_\_\_\_\_(child's name) have less or more mouth pain after surgery? Did eating get better or worse? Was \_\_\_\_\_ able to sleep better or worse after surgery? Was \_\_\_\_\_ more happy or cranky?"

### **Communication with dentist and staff:**

- 11- *Cause of dental problem:* "What did the dentist or the Monarch staff tell you about how \_\_\_\_\_(child's name) got holes in her/his teeth?"
- 12- *Office dental education:* "Tell me what you learned from the dentist or the Monarch staff about what you should do at home to take care of your child's teeth?"
- 13- *Success with change:* "Have you tried to change anything about how you look after your child's teeth since she/he had the dental surgery? Why/why not?" How is it going?"
- 14- *Dental wish:* "What do you want for your child's dental health?" or (if no response), given your experiences, if I could give you a wish for your child's teeth, what would you wish for?"

### **Problem solving:**

- 15- *Dental decay/infection:* "I would like to ask your advice about how to talk to parents about new ideas. We have learned that dental cavities are an infection. Infections in baby teeth lead to infections in adult teeth. The surgery your child had will keep the infection away for about 6 months. After 6 months your child could get new cavities again. Many dentists do not know this new information"

“There are a number of ways to stop or slow down this infection so that your child will stay healthy. Are you interested in learning about some of these ways?” (If parent interested/not interested, explore why/why not.)

“There are things dentists can do and things you can do at home. Usually it works best to do more than one of the things on the list”.

- Taking your child to a dentist to have him/her paint a safe medicine on the teeth that will protect them for infection.

*(Explore: number of times a year reasonable, limits, anticipated problems).*

- Taking your child to the dentist every 6 months for an examination to make sure the infection is not a problem. Small cavities can get better.

*(Explore: frequency of visits, every three months? two months?)*

- An adult brushing the child's teeth once a day, using toothpaste.

*(Explore: frequency of brushing? How often? When? Problems doing this?)*

- Changing what your child eats and drinks

*(Explore possibilities: bottle or sippy cup use? choice of beverage? Working with grandparents or others who give child sweets)*

- Having the child chew a special gum 4 to 5 times a day.

“Now think back to the time your child had dental problems and was put to sleep. When would be the best time to talk to parents about the infections and ways to stop them?”

- Is there anything else I should have asked you or you would like to say?
- I will transcribe the recording and think about that, by the time the interview has been analyzed, if some questions have occurred, may I contact you again?

*Thank you for your ideas and opinions and for your time.*

## Appendix 7-4 (interview guide, Cohort A2)

### Interview Guide (cohort A2)

#### Dental treatment under general anesthesia: "Listening to parents" (One-year follow up)

##### Well-being of child and parent

**Q1. (*Child well-being*):** "Let's talk about \_\_\_\_\_ (child's name) Tell me how \_\_\_\_\_ has been doing? What has he/she been up to? Any problems with her/his teeth in the last year? What kind of problems?" (could be more specific and refer to what work child had done at GA; and ask about any problems with the caps or the extractions)

**Q2 (*Parent well-being*):** How have you been? (Some of the problems an individual parent spoke about at interview #1 will be referred and asked if things are better or worse. For example: "I remember last time we met, you said that you were working long hours and finding it difficult to have time for your children. How are you doing now?")

##### Oral care

**Q3** Now, I would like to talk about \_\_\_\_\_ (child's name) diet and oral hygiene

**3.1 (*Dietary habits*):** Tell me what are \_\_\_\_\_ (child's name) favorite foods for mealtimes? How about favorite snacks? Does \_\_\_\_\_ (child's name) avoid any foods? Why? Have any of \_\_\_\_\_ (child's name) eating or drinking habits changed since his/her teeth were fixed? (Individual questions refer to Interview #1 for example: How does Aaron react now when other children having a chocolate bar or juice?

**3.2 (*Mouth care*)** Individual questions refer to interview #1. For example: the last time we met, you talked about the difficulties that you had when you were brushing Jason's teeth, how is it going now?

**3.3 (*Success*)** "How successful have you and \_\_\_\_\_ (child's name) been in following healthy eating and tooth brushing habits?"

**3.4 (*Barriers to change*)** "Tell me about the barriers, difficulties or challenges you have had to follow healthy eating and brushing habits."

“How did you deal with these problems? What strategies did you use?”

“How would you advise other parents in overcoming these problems?”

**3.5** *“(Supports to change)”* “what did help you to follow healthy diet and brushing habits?”

**3.6** *“(Benefits from professionals)”* “Tell me again what lessons did you learn from the dental staff or the dentist here at Monarch that had the biggest impact on you?”

### **Impact of GA**

**4.1** *“(Changes in child since GA)”* “Tell me about any changes that you have noticed in \_\_\_\_\_ (child’s name) since his/her teeth were fixed.”

**4.2** *“(Perceived susceptibility)”*: “After the GA, what was your thinking about \_\_\_\_\_ (child’s name) getting new cavities? Did you think her/his teeth were more or less likely to get new cavities again after the treatment (compared to the child before the GA)? Why did you believe this?”

**4.3** *“(Reaction to another GA)”*: “If there were the need to have further dental work, would you prefer it to be done with or without GA? Why?”

**4.4** *“(Effect of GA on parent and child)”* “Tell me about the effect of the GA experience on how you care for \_\_\_\_\_ (child’s name) teeth?” How about your other children?” How does it affect \_\_\_\_\_ (child’s name)?” (Refer to Interview #1. For example: last time we met, you talked about Ryan being more aware of and caring more about his teeth, does he still feel the same?).

### **Present dental health**

**Q5** *“(Check-up results)”* “I see from our questionnaire that your child had a perfect checkup. That’s great!”

**5.1** “Tell me why your child had no cavities this time.” (And if the child had new cavities), “Why do you think your child had new cavities? How do you feel about this, after going through a GA only a year ago?”

**5.2** *“(Child behaviour at dentist)”* “Describe how \_\_\_\_\_ (child’s name) behaved at her/his last dental visit. Was her/his behaviour better or worse or the same as the first visit here before his/her teeth were fixed? Why do you think she/he behaved this way? Do you think GA experience has had any effect on the way she/he behaved?”

### **Advice to other parents**

**6.1** (*Helping other parents*) "As I said when we first met, we are trying to understand more about why some children get cavities and others do not." As a parent why do you think some children get cavities and others do not?"

**6.2** "Based on your experience, how can we help parents of young children make sure their children have healthy teeth?"

**6.3** "If you had to start again from the day your child got her/his first tooth, what would you do differently?"

I have no further questions. Do you have anything more you want to bring up, or ask about, before we finish the interview? Is there anything else you would like to say?

*Thank you for your ideas and opinions and for your time.*

## Appendix 7-4 (interview guide, Cohort B)

### Interview Guide (cohort B)

#### Dental treatment under general anesthesia: "Listening to parents"

#### A qualitative look at parents' beliefs and understandings of their child's dental experience

##### Parents' oral health beliefs

**Q1.** The first questions are about your own teeth

**1.1** (*General concept*) Describe your mouth when it is "healthy".

**1.2** (*Perceived Susceptibility*)? Is getting cavities a normal and natural part of life? Please explain.

**1.3** (*Self efficacy*) There is a lot of information around about how to prevent tooth decay. Do you think we really can prevent tooth decay? Why/why not? Do you think you will be able to keep your teeth for life? Why/why not?

**1.4** (*Seriousness*) Is losing a tooth, or teeth, a serious matter for you? Tell me why/why not?

**1.5** (*Dental experience physical or financial aspects*) Tell me about your own visits to the dentist and how often you go to the dentist? Is seeing a dentist any problem for you because of

1. pain or discomfort at the dentist
2. anxiety or fear about going to the dentist
3. cost of going to the dentist

**Q2.** *Baby teeth:* Now, I would like to talk about your child's teeth "Tell me what you know about baby teeth"

**2.1** (*Perceived susceptibility of baby teeth*) Do you think baby teeth are more or less likely to get cavities than adult teeth? Why do you believe this?

**2.2** (*Self efficacy*) What about tooth decay in children. Tell me your thoughts on whether you think tooth decay in children is preventable or whether it is something a child inherits from a parent.



- 2.3 (*Seriousness*) Is tooth decay a “normal” part of life for young children, or not? Sometimes a child has to have a baby tooth pulled. Tell me how you feel about pulling a baby tooth.
- 2.4 (*Benefits of office dental care*) At a dental office, we often get advice and information about preventing cavities from the dentist or the office staff. Do you think this advice is helpful? Why/why not?
- 2.5 (*Child’s first dental visit*) What is the right age for a child’s first dental visit?

### Impact of GA

#### **Q3. Parent’s thoughts on general anesthesia:**

- 3.1 “When you were told that \_\_\_\_\_ (child’s name) needed a GA for dental treatment, How did you react?”
- 3.1 “Try to remember when \_\_\_\_\_ (child’s name) was asleep and being worked on by the dentist. Can you tell us what you were thinking and feeling during this time?”

#### **Q4 Child’s response to GA (oral health-related quality of life):**

- 4.1 (*Functional aspect*): “Does \_\_\_\_\_ (child’s name) have less mouth pain or more mouth pain since the surgery? Has his/her eating been better or worse? Has \_\_\_\_\_ been able to sleep better or worse after surgery? How about his/her tooth brushing habits? Did they change? Overall, would you describe \_\_\_\_\_ as being happier or unhappier since the surgery?”
- 4.2 (*Psychological aspects*): “How did he/she feel about her/his teeth before treatment? How does he/she feel now?”
- 4.3 (*Social aspects*): “Did other kids make fun of her/his teeth before the surgery? How about after the surgery?”
- 4.4 (*Changes in child since GA*) “Tell me about any changes that you have noticed in \_\_\_\_\_ (child’s name) since his/her teeth were fixed.”
- 4.5 (*Perceived susceptibility*): “After the GA, what was your thinking about \_\_\_\_\_ (child’s name) getting new cavities? Did you think her/his teeth were more or less likely to get new cavities again after the treatment (compared to the child before the GA)? Why did you believe this?”

4.6 *(Reaction to another GA):* "If there were the need to have further dental work, would you prefer it to be done with or without GA? Why?"

4.7 *(Effect of GA on parent and child)* "Tell me about the effect of the GA experience on how you care for \_\_\_\_\_ (child's name) teeth?" How about your other children?" How does it affect \_\_\_\_\_ (child's name)?"

**Parent's readiness to change:**

**Q5 *Office dental education***

5.1 "What did the dentist or the Monarch staff tell you about how \_\_\_\_\_ (child's name) got cavities in her/his teeth?"

5.2 "What did you know about dental decay in baby teeth before coming to Monarch? Tell me what you know now that is different from what you knew before? What did you learn from the staff or dentists at Monarch?"

5.3 "Can you tell me the main factors responsible for dental decay in children? Do you know that bacteria or germs are involved in causing cavities?"

5.4 "Tell me what you learned from the dentist or the Monarch staff about what you should do at home to take care of your child's teeth? Has anyone ever shown you how to brush your child's teeth?"

**Q6 *Success with change***

6.1 "Have you tried to change anything about how you look after your child's teeth since she/he had the dental surgery? Why/why not? How is it going?"

6.2 "Tell me about the difficulties that you have had in changing how you look after your child's teeth? Do you think you will be able to keep up these changes? "What barriers or obstacles may prevent you from keeping up these changes

6.3 "Tell me how the day-to-day stress and pressures of your life affect the way you look after your child's teeth?"

6.4 "If you had a second chance with your child's teeth, what would you do differently?"

**Present dental health**

Q7 *(Check-up results)* "I see from our questionnaire that your child had a perfect checkup. That's great!"

7.1 "Tell me why your child had no cavities this time." (And if the child had new cavities), "Why do you think your child had new cavities? How do you feel about this, after going through a GA only a year ago?"

7.2 (*Child behaviour at dentist*) "Describe how \_\_\_\_\_ (child's name) behaved at her/his last dental visit. Was her/his behaviour better or worse or the same as the first visit here before his/her teeth were fixed? Why do you think she/he behaved this way? Do you think GA experience has had any effect on the way she/he behaved?"

### **Advice to other parents**

8.1 (*Helping other parents*) "As I said when we first met, we are trying to understand more about why some children get cavities and others do not." As a parent why do you think some children get cavities and others do not?"

8.2 "Based on your experience, how can we help parents of young children make sure their children have healthy teeth?"

8.3 "If you had to start again from the day your child got her/his first tooth, what would you do differently?"

I have no further questions. Do you have anything more you want to bring up, or ask about, before we finish the interview? Is there anything else you would like to say?

I will transcribe the recording and think about that, by the time the interview has been analyzed, if some questions have occurred, may I contact you again?

*Thank you for your ideas and opinions and for your time.*

## Appendix 7-4 (interview guide, Dentists)

### Interview guide for dentists

1. Describe the preventive counselling that Monarch routinely provides for your patients who need GA dental treatment.
  - a. What exactly happens at these “preventive visits?”
  - b. At what stage of the treatment process, e.g. the GA consultation appointment or at follow-up after all treatment is completed, does this counselling take place?
  - c. Anything else that you would like to say about your approach to prevention in high-risk children
2. When do you find parents are most receptive to your preventive messages? How about parents of “GA patients”?
3. In your experience, what differences have you observed between families whose child returns with new cavities after GA dentistry and families with caries-free children?
4. We found that parents of children with new cavities at their recall appointment.  
*(to be discussed one at a time)*
  - Do not seem to value baby teeth as much as the other group;
  - Do not seem to be aware that their child is at risk for new cavities;
  - Are less receptive to advice from others including dental professionals or anyone else;
  - Are more permissive to their child’s wishes;
  - Are not yet ready to change their behaviours;
  - Do not have any immediate plans to change their “home care” behaviours

What do you think about these findings? Why?

5. We also found that our Chinese families are: *(to be discussed one at a time)*
  - Very aware of the bacterial contribution to the etiology of caries,
  - Permissive about their child’s food choices
  - Reliant on professionals rather than themselves to maintain their child’s dental health

What do you think about these findings? Why?

I have no further questions. Do you have anything more you want to bring up, or ask about, before we finish the interview? Is there anything else you would like to say?

*Thank you for your ideas and opinions and for your time*

## **Appendix 7-5 (Manuscript 1)**

### **A QUALITATIVE LOOK AT PARENTS' EXPERIENCE OF THEIR CHILD'S DENTAL GENERAL ANETHESIA**

A version of this chapter has been published in the **International Journal of Paediatric Dentistry**, was presented in a poster at the American Association of Dental Research (AADR) Annual Session, Orlando, March 2006 and the abstract was published in a special issue of the **Journal of Dental Research**. It was also orally presented in the Canadian Academy of Paediatric Dentistry (CAPD) Annual meeting, Niagara-On-The-Lake, September 2005 and the abstract was published in the proceedings of the meeting.

Amin MS, Harrison RL, Weinstein P: A qualitative analysis of parents' experience of their child's dental general anaesthesia. *International Journal of Paediatric Dentistry*, 16(5): 309-319, 2006

Amin MS, Harrison RL: A child's dental general anaesthesia as perceived by the parent, *J Dent Res* 85, Special Issue A, Abstract # 449, 2006

Amin MS, Harrison RL: Parents' experience of their child's dental general anaesthesia. *Proceedings: Canadian Academy of Paediatric Dentistry Annual Session*, Abstract # 1, 2005

## Introduction

Extensive dental decay in preschool children, or "early childhood caries" (ECC), is a troubling child health problem that can have a profound effect on a child. The effects of painful teeth on a child's eating, sleeping, disposition and healthy development are well known<sup>1</sup>. Despite the general reduction in the prevalence of dental caries in industrialized countries, children from disadvantaged communities and minority ethnic groups continue to experience high levels of disease.<sup>2, 3</sup> The prevalence of ECC in British Columbia, Canada, ranges from 10 to 27% of children entering kindergarten.<sup>4</sup> Each year about 5000 B.C. children less than 4 years of age are treated under general anaesthesia (GA) for ECC at an annual cost of \$10 million.<sup>5</sup> Even more alarming is that soon after such costly and risky treatment, many children develop more decay, i.e. suffer "caries relapse", and need additional extensive treatment, and in many cases, a second surgery.<sup>6, 7</sup>

Dental care under GA for preschool children has been reported to be well-accepted by parents and is perceived to have a positive social impact on their child.<sup>8-10</sup> Parents have reported more smiling, improved school performance, and increased social interaction after the procedures<sup>10</sup>. Even though parents often express concern about morbidity related to dental treatment under GA, the most common complaint reported by parents is post-operative pain as a result of the dental treatment itself.<sup>11, 12</sup> In a survey of 98 children who had dental treatment under GA, parents were asked whether they would like their child to be treated under GA again; 81% of the parents replied positively. No parent responded completely to the negative, but 18.4% of parents indicated that they would only choose this treatment modality again if no other solutions were available.<sup>13</sup> Therefore, the event of

general anaesthetic surgery to complete a child's dental work does not appear to be as traumatic for either parent or child as might be expected.

Many investigators have attempted to identify the factors associated with caries relapse after GA dental treatment.<sup>6, 14-16</sup> One group of investigators determined the factors associated with the event of a second "dental GA" to be "child factors" including extensive incisor caries at time of GA, history of bottle feeding, and poor cooperation for dental appointments, and "parent factors" including not brushing their child's teeth, a dysfunctional social situation, and failure to return for follow-ups. As a result of these findings, the strategies recommended to improve the long-term dental health of high-risk children were aggressive treatment of existing caries at time of the GA, active postoperative follow-up, and education of caregivers.<sup>17</sup> In contrast, other investigators concluded that aggressive dental surgery for ECC did not result in decreased caries relapse.<sup>18</sup> None of these investigators explored whether the GA dental treatment itself had any effect on modifying parental attitudes, changing their behaviours related to their child's oral health, and, as a result, diminishing their child's risk of relapse.

Understanding the "dental GA experience" from the parent's point of view, and also understanding the parent's perception of their child's response and feelings about the GA may help us understand why this invasive event is not the "cue to action" that one would expect. An exploratory, qualitative approach will provide a more in-depth understanding of the parents' experience than is possible from a purely quantitative approach.<sup>19</sup> In the past decades, qualitative research has provided health care researchers with rich descriptions of parent's everyday experiences of their child's health struggles.<sup>20,</sup>

<sup>21</sup> This methodology is slowly beginning to appear in the dental literature as well.<sup>22, 23</sup>

This study was a qualitative exploration of parents' experiences of their child's dental treatment under GA and their impressions of the impact of this treatment on the daily life of their child.

### **Methods**

Approval for the study was received from the Behavioural Research Ethics Board of University of British Columbia, Canada. One-on-one, semi-structured interviews were conducted by the first author (MA) using an interview guide (Table 1). In addition, information on demographics, child's feeding, and child's dental history was recorded in a short questionnaire. Following each interview, the interview guide was modified as necessary in an iterative fashion based on responses.

Subjects were English-speaking parents from a variety of ethnic backgrounds whose children had recently been treated under GA at Monarch Paediatric Dental Centre, a paediatric dental practice in Burnaby, British Columbia. This private practice has an on-site general anaesthetic suite. Although the dental centre is a private practice, the costs of treatment of many of the children, either with or without GA, are supported by publicly-funded programs. All referrals to this specialty practice by general dentists were because of the child's behaviour management issues and need for extensive dental rehabilitation which included extraction of teeth and restorative dentistry. Only parents of children under 6 years old were recruited for the study. Of the parents approached to participate, a small number refused because of time constraints. Interested parents were interviewed individually at their child's scheduled follow-up appointment 7 to 14 days after the surgery. All interviews were conducted either in a quiet area of the dental office or in the child's home. The interviews lasted between 25 to 50 minutes.



**Table 1 Original interview questions**

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1. How would you describe a healthy mouth?
  2. What do you know about baby teeth?
  3. What were you thinking and feeling when your child was asleep and being worked on by the dentist?
  4. How is your child doing after the dental work?
  5. What did you learn from your experience?
-

**Table 2 Demographics of participants**

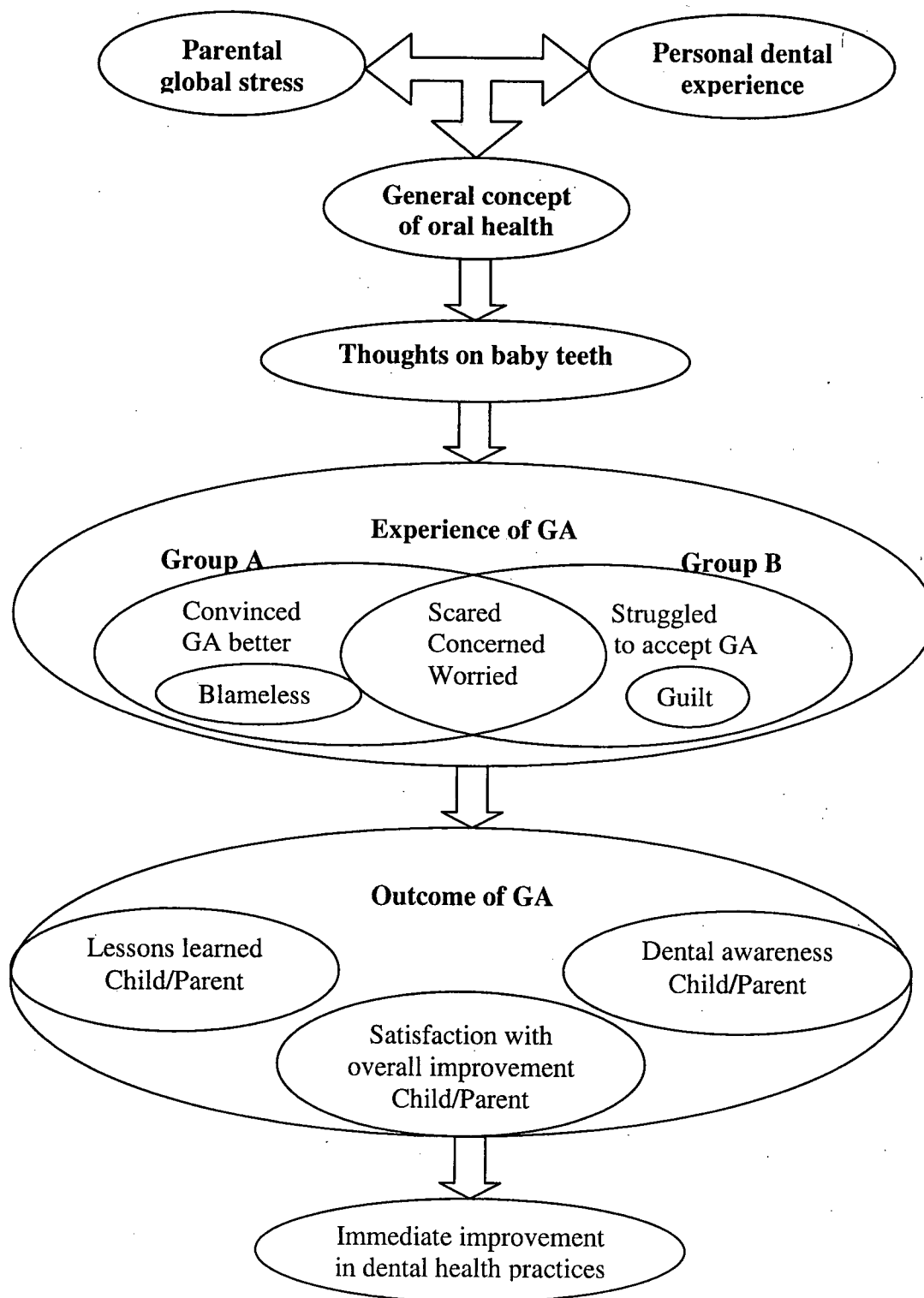
<b>Inclusion criteria</b>	English-speaking parents of children under 6 years of age in need of GA
<b>Number of participants</b>	11
<b>Child</b>	
Age range	2.5-6 yrs
Gender	Female = 4    Male = 7
Birth order	First child = 5 Second child and beyond = 6
dmfs range	6-50
<b>Parents</b>	
Gender	Mother = 8    Father = 3
Mother's age range	26-45 yrs

Interviews were audio-taped, transcribed, checked and coded into the *Nvivo* software program. The approach to data analysis was grounded theory.<sup>24</sup> The transcripts were read and reread carefully and codes were identified. A listing was made of all codes. Similar codes were grouped together to create clusters. Clusters were then reduced into meta-clusters with labels and the labels became concepts. Similar concepts were grouped together to develop categories and subcategories.<sup>25</sup> Linkages were made among categories. 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. Eleven participants were interviewed before data was determined to be saturated.

### **Findings**

Demographic information of the children and parents participating in the study is summarised in **Table 2**. Six major categories were identified from the transcripts (**Figure 1**).

**Figure 1** An overview of categories and sub-categories



### Parents' concept of oral health

Parents' different concepts of oral health will affect the health behaviours that they initiate for their child. The general concept of oral health for this group of parents was "not having any sign of dental diseases" (Figure 2). This group of parents appeared to have an "absence of disease" approach to both their oral health and their children's oral health. It also appeared that their concerns were limited to "cavities" rather than a more holistic view of oral health in general. When asked:

*"How do you describe a healthy mouth?"*

a 29-year old mother replied:

*"That's no cavities at all."*

Parents also expressed differing levels of satisfaction with their own oral health. Another mother seemed to normalize the presence dental cavities because they are such a common occurrence:

*"I think having a cavity is OK, because I don't think there is anybody out there without a cavity."*

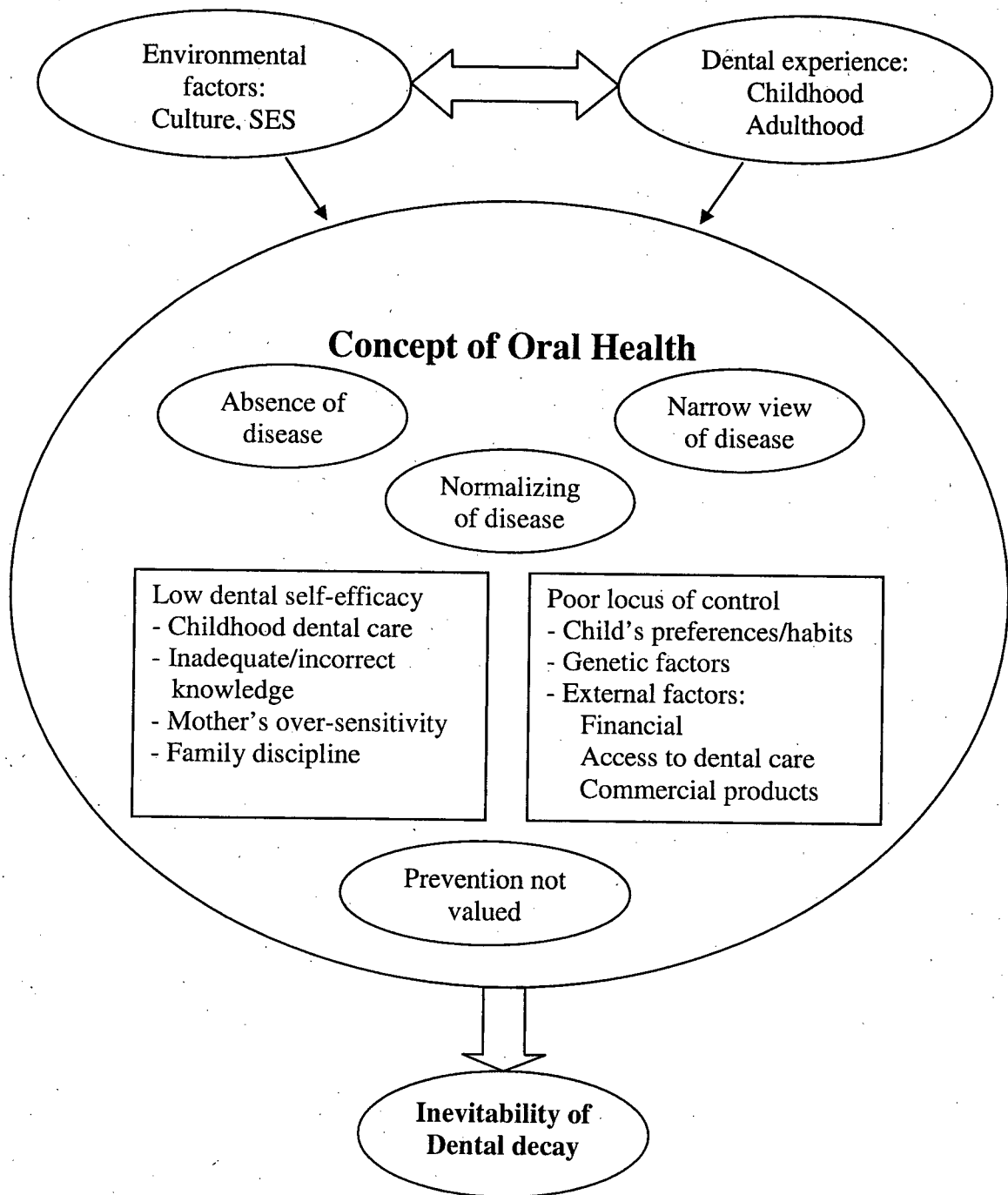
She also expressed doubt about the effectiveness of prevention and perceived the disease to be "inevitable":

*"... even if it is preventable, but it happens."*

A 53-year old father of 3-year old girl suggested that genetic factors enhance the inevitability of dental decay:

*"...cleaning the teeth may help to save them, but genetics is also an important factor."*

**Figure 2** Parents' overview of oral health



### **Dental treatment experiences of parents**

Parents were also asked about their own experience as dental patients. Most parents referred to their childhood dental care in either a positive or a negative way. A 29-year old mother of two boys explained:

*"My own teeth have been fine; we have been in a regular check ups in the health units; my mom took us every three months or six months, so we were OK".*

However, another mother complained about her childhood dental care as:

*"When I was little my teeth were very bad. Most of the teeth were pulled out by the dentists, because we didn't brush, nobody taught you to brush ..."*

Almost all the respondents described some problems with their teeth as children and later as adults. However, most parents did their best to be regular dental attenders:

*"We used to go every 6 months, but now the dental plan covers only once a year."*

Dental fear and anxiety as a result of past negative dental experiences were not reported by this group of parents. In the words of another mother:

*"I have excellent dentists; they've always been very skilled, very gentle, I have never had any fear of the dentist."*

### **Child's dental health**

Parents were asked about their views on primary teeth. The contribution of "baby" teeth to eating, speaking, appearance, and healthy adult teeth was acknowledged by the parents:

*"I know baby teeth are very important; if they get "rot" they would destroy the second set; it's also related to their digestion and nutrition."*

The comment of a 34-year old mother of three children, all of whom had had dental treatment under GA, about the importance of primary teeth was:

*"Because of their appearance, a lot of people see them. If they don't look nice, the kids get teased and bugged."*

When asked about the cause of dental decay in primary teeth she remarked:

*"From breast-feeding so much, even though we brushed, I guess we were not brushing as best as we should have been, and from eating things that they shouldn't eat like candies, pop ..."*

Some parents simply linked tooth decay to hereditary factors:

*"I think we have to blame genetics, some people are born with strong teeth and some not."*

Others described "baby" teeth as being more likely to get dental decay than adult teeth because of children's feeding habits and poor cooperation with home-care practices. A 29-year old mother of two boys said:

*"I guess it's because of the bottle and the way that children eat and brush the teeth."*

A 45-year old mother of 5½-year old girl similarly commented:

*"I would say it is preventable but it is very difficult, because you cannot control what your kids eat when you send them somewhere."*

While parents were unhappy about their child having cavities, losing a tooth was seen as a more serious problem. A single mother with two children explained her feelings about her son's tooth loss:

*"A cavity here and there is okay, but like, five teeth pulled out, it was just ridiculous; it hurt him, and it's more or less my fault."*

Another mother similarly blamed herself for her child's tooth loss:

*"I feel bad, because I feel that I've done something wrong that his tooth has to go ..."*



### **Stress of life**

Most parents in this study reported that the stress of daily life was a barrier to caring for their child's teeth. Types of stress experienced by parents in this study could be classified as economic (financial concerns); sociodemographic (employment issues, marital discord, and number of other children); maternal psychological (daily tasks of parenting, worries about child well-being, satisfaction with the parenting role); and child-related (behaviour, eating habits, and dental health care). One 45-year old mother admitted:

*"If I had a chance, I would have stopped the bottle earlier. I would have stopped her eating candies ... better diet. Because of the family pressure, I didn't have much time for my children."*

Most parents did report additional stress around the time that their child had the GA. However, the association between day-to-day stress and the anxiety experienced by these parents during the GA was reported differently by different parents. A 26-year old single mother of 2 children, aged 3 ½ and 2 years, was asked to rate, between 1 to 10, her level of stress as a result of the GA. She said:

*"Probably 5, the only problem was getting him to a dentist."*

Of her day-to-day stress level she said:

*"I'm a single mom, probably the same, roughly in between; it's not, like, a very stressful life"*

A father of an only child, a 3-year old girl, described his overall level of stress:

*"It's 5; usually we do quite well."*

However, he mentioned an additional stress in the month before the GA:

*"I probably would say 7; I have felt more pressure in the past few months because of my daughter's surgery."*

### **Experience of GA**

Overall, most parents responded with emotion (fear, worry, concern) when they first found about the need for a GA and again during the time that their child was in the "operating room". Mothers seemed to report greater levels of anxiety compared to the fathers who were interviewed. A 33-year old mother of an only child described her feelings about the GA:

*"I've never known kids had surgery for teeth; I really panicked, felt like a moron, for bringing a child at this age through surgery because of neglect of the teeth."*

While some parents blamed themselves for their child's need for dental GA and described their feeling as "guilt", demonstrated in the above quote, others felt "blameless" and were convinced that a GA procedure was the only way to treat a young child. In the words of a father of a 3-year old daughter:

*"I felt just normal because I knew this is the way it should be. She is very young."*

Nonetheless, emotions like "fear" and "worry" were common in both groups of parents (group A and group B in **Figure 1**).

*"I knew it was safe and better than taking them in and doing everything when they are awake, but I was scared because he was my son."*

The child going to sleep "so fast" was described as a particularly negative part of the experience. A mother of the three children said:

*"I don't mind them going under GA, but the things that scare me the most is they go to sleep so fast, like they die!"*

In the words of another mother:

*"They asked me to hold him and suddenly he dropped off my shoulder; I am telling you no mother wants to see that, and then like he died ..."*

Parents appeared to be aware of the complications of GA and most considered it a serious procedure with known risks. In the words of a 44-year old mother of 2½-year old:

*"I was scared. I was thinking what if he wouldn't wake up, and when he wakes up, what if something is wrong with his brain."*

Experiencing a previous GA with other siblings did not seem to reduce parents' emotions:

*"I had similar experience for my daughter, for her tear ducts, they put her to sleep and did the surgery, I knew but still I was worried because he was a different child in a different situation, really worried about what would happened."*

Even the mother whose two other children had a dental GA experience divulged:

*"I think I was more scared than she was; she didn't really understand what she had to do, I have been there with my other children, so I knew."*

### **Outcome of GA**

After the procedure, parents reported overall improvement in their child's well-being. Episodes of tooth pain decreased and sleeping patterns, eating habits, and tooth brushing improved. A mother of a 3-year old girl described:

*"She has no pain any more and she never wakes up during the night at all. She brushes her teeth a lot better now than she used to ...."*

Improvement in brushing habits was reported by other parents as well:

*"He has more awareness of his teeth. I think he cares more about his teeth."*

A mother of a 6-year old child excitedly described her daughter's oral hygiene behaviours after the GA:

*"I was very surprised this morning that she actually wanted me to floss for her."*

However, no matter how pleasing the outcome, it appeared that the GA dental treatment itself was a difficult experience for most children. Some parents even speculated that their child might avoid future dental visits as a result of long-term trauma after the GA. Parents repeatedly expressed:

*"She/he doesn't want to come back to the dentist."*

Losing teeth was also an issue for many children not only related to loss of function, but the psychological impact was mentioned to be a concern. The first reaction of some children who lost their front teeth was tears and crying. Some children immediately tolerated the loss; while others struggled to get over it:

*"He was hurt and he is still hurt from it, that's why he doesn't let anyone open his mouth, it bothers him a lot."*

Some parents complained about their child having eating troubles:

*"Her eating is not back to where it was before the surgery, because she is still learning how to eat without the teeth she had before."*

Reports varied on the child's social interactions after the GA. Some children had challenges related to their new condition:

*"She was complaining that her friends think she is talking funny. I guess she is not very happy about losing the teeth."*

While others got pleasure from their dental treatment:

*"He thinks he is very cool now that he got steel things on his teeth."*

## Discussion

Results reported in this paper are part of a larger study in which we are exploring oral health behaviour change in parents of young children. Our long-term goal is to develop acceptable and effective interventions to prevent caries relapse after oral rehabilitation under GA. To achieve this goal, we are developing a model to describe the process of behaviour change in these high-risk families. We hope our model will provide better insights into the motivators and also into the barriers to behaviour change. While there are many theories of behaviour change, there is no theoretical model particularly applicable to parental oral health behaviours.

A qualitative method of inquiry was undertaken to help us to better understand parents' experience of their child's dental GA. A one-on-one interview provided a safe environment for parents of differing backgrounds to express, in their own words, how they felt about the GA and what was their child immediate response to this aggressive treatment. The "dental GA" is but one event in the life of a child. Parents' beliefs about oral health and their own dental experiences and other aspects of daily life may influence the parents and child's response to the GA and also need to be explored.

No agreement exists about sample size in qualitative studies. Sample sizes have ranged from as few as one or two subjects,<sup>26, 27</sup> to closer to thirty.<sup>28</sup> For the purposes of this study, the 11 in-depth interviews provided us with a detailed, coherent, and rich description. Similar to other qualitative studies,<sup>28, 29</sup> this sample size resulted from saturation of the data as reflected in repeating themes. Data saturation is reached when no new information is forthcoming and nothing new is heard in the interviews.<sup>24</sup>

### **Parents' concept of oral health**

People with different beliefs about oral health may experience an event like their child's dental GA differently. To better understand parents' experience of their child's dental GA, we initially explored their general thoughts on oral health as well as their attitude towards the health of primary teeth.

Parents' perceptions of oral health in general may serve as a barrier to their child's optimal oral health. Families "practice health" in two different ways either with a "health promotion" focus or with an "illness-prevention" focus. The "health promotion" families have a broader concept of health compared to the "illness-prevention" families.<sup>29</sup> They are more sophisticated in their educational strategies and used approaches associated with developing their child's health behaviours.<sup>29</sup> Socioeconomic status and cultural background of families may also influence their perception of oral health and their subsequent oral health behaviours.<sup>30</sup> In the present study, most families appeared to be engaged in "illness prevention" rather than "health promotion". They were more concerned about immediate oral health threats like dental pain. Before the GA, they had not been involved in thinking about or planning for their children's oral health.

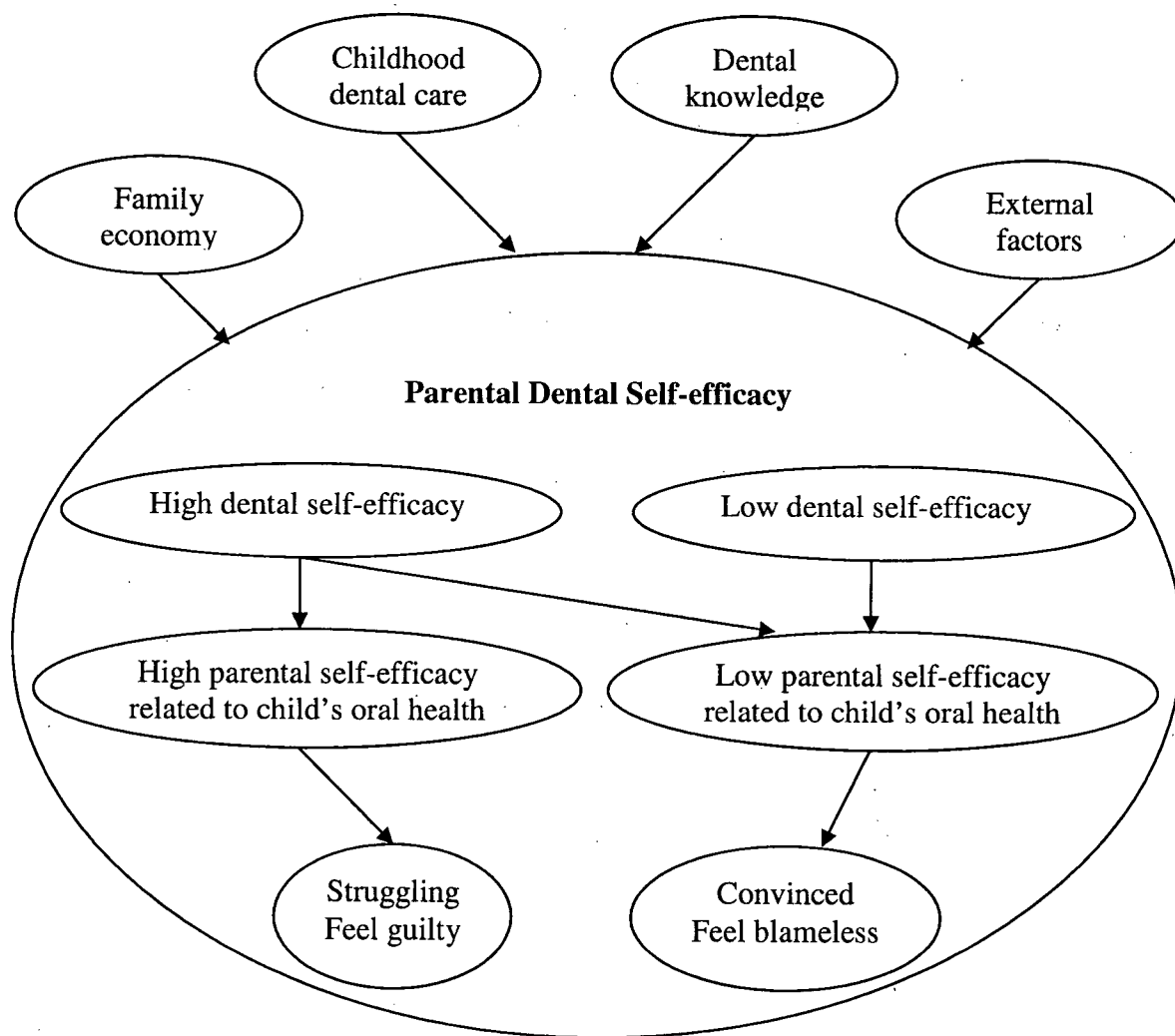
Furthermore, parental beliefs about their abilities to control their own and their child's oral health are one of the most important motivators to pursue health promoting behaviours.<sup>31</sup> In our study, while most parents expressed doubt about their ability to control dental decay, i.e. dental self-efficacy, there were some who viewed themselves capable of avoiding dental decay. However, most parents from both groups, either with high dental self-efficacy or low dental self-efficacy, appeared to have low "parental self-efficacy" related to controlling their child's oral health including their eating habits and

oral hygiene (**Figure 2**). They believed “it is difficult to prevent dental decay in young children”. Perception of limited control of child’s oral health by these parents appeared to be related to factors like their own poor childhood dental care, their inadequate or incorrect knowledge, limited family income, and external influences (access to dental care, commercial products).

A clear model of regular dental care acquired in childhood has been related to better dental self-efficacy, while an unclear model or the lack of any model has been related to poorer self-efficacy.<sup>32</sup> In addition, the amount and quality of parental knowledge about the cause of dental disease may lead to an overestimation or underestimation of their abilities to control dental diseases.<sup>33</sup> For instance, many parents mentioned heredity as the main factor responsible for dental caries. However, the association between genetic inheritance and dental caries has been demonstrated to be weak and does not provide a predictable basis for predicting future dental decay.<sup>34</sup> In addition, families with adequate financial resources express higher self-efficacy towards maintaining their child’s oral health. These families have the greatest probability of having a regular pattern of preventive care.<sup>32, 35</sup>

Overall, parents with higher levels of “dental self-efficacy” had more of a struggle to accept GA for their child’s oral rehabilitation and blamed themselves for placing their child at such a risk. On the contrary, parents with lower levels of “dental self-efficacy” felt more comfortable and “blameless” (**Figure 3**).

**Figure 3** Parental dental self-efficacy and their feelings about their child's GA





### **Dental treatment experiences of parents**

Parents' negative treatment experiences have been identified as important determinants of their health beliefs and subsequent behaviours that may hinder them seeking professional dental care for their child.<sup>30, 36, 37</sup> However, adverse dental experiences related to pain or discomfort at the dentist or anxiety or fear about going to the dentist were not reported by parents in this study. The newer generation of parents do not appear to be burdened by previous negative dental experiences like their own parents were.

### **Child's dental health**

Superficial dental health knowledge and an equivocal attitude towards the health of primary teeth have been previously reported for parents of at risk preschool children.<sup>38</sup> However, parents in our study appeared to know how to keep their child's teeth healthy and expressed an even more positive attitude towards maintaining the health of primary teeth as a result of the GA experience. Parents feared being blamed for their child having extensive dental decay at such a young age. Consequently, a few mothers felt "guilty" and blamed themselves. In fact, some mothers admitted that they might have been able to prevent their child's dental troubles. "Parental guilt" might be a cue for parents to re-examine their responsibilities for their child's oral health, to take action, and to change their behaviours related to their child's oral health.

### **Stress of life**

Parenting stress is conceptualized as a condition where the different demands of parenthood result in a perceived discrepancy between situational demands and personal resources.<sup>39</sup> Parenting stress has been found to be associated with a number of negative consequences both for the parents and for the children.<sup>40-42</sup> Some parents in our study

discussed the negative influence of daily stress on their parenting practices and their child's dental health. However, other parents seemed to accept stress as an expected consequence of being a parent. In addition, different parents reported different levels of anxiety during the GA. Those parents who, presumably, preoccupied with more immediate and pressing family issues like being a "single mom" seemed less likely to be influenced by the stress of the GA. In contrary, parents who had a more peaceful life reported an additional stress related to their child's GA dental experience.

The psychological effect of anaesthetic induction on children and their parents has been explored previously,<sup>43</sup> but the association between GA-related parental anxiety and day-to-day stress was not examined. Parental distress during the anaesthetic induction was observed to be related to variables such as discord between mothers and fathers, mothers of an only child, and mothers or fathers who were health care workers.<sup>43</sup> Similar to our study, mothers reported a higher level of anxiety compared with the fathers.<sup>43</sup> Perhaps the difficulty of the experience for both parent and child helps explain the poor return for recall assessment that has been repeatedly observed.<sup>44</sup> The trauma does not seem to encourage follow-up and, in some cases, may be a discouragement.

### **Experience of GA**

Parent's preparation for, attitudes and emotions about, and experiences with being present for their child's anaesthetic were explored in this study. Some parents felt well-prepared and were satisfied with their amount of preparation. In some cases, they thought the GA was "preferable" for their child and superior to local anaesthesia. They perceived GA as the only possible way to successfully treat their young child. However, in contrast to a previous report,<sup>45</sup> most parents did realise GA was potentially hazardous for their child's

health. While some parents were more concerned about the dental outcome of the procedures other parents experienced increased anxiety and worry during the GA.

### **Outcome of GA**

Parents have frequently reported a positive impression of dental outcomes after their child's GA.<sup>10, 46</sup> Similarly, almost all parents in our study reported improvements in their own and their child's oral health behaviours. Most children were pleased about their new clean mouth and wanted to keep it that way. The most common changes in child's behaviour mentioned by parents were increased tooth brushing and decreased consumption of sugary foods. However, these reports were given within two weeks the GA. The question is: will these dentally-healthy behaviours endure?

It was an interesting, and not previously reported, finding that some children had difficulties coping with the consequences of extraction of their teeth. Most parents reported their child having immediate trouble with eating because of the tooth loss. They also talked the emotional reaction of their child to tooth loss. Losing a number of teeth was a shock to many children. Perhaps, if children were better prepared in advance both by parents and dental staff, the "loss" would not be such a surprise for them. All dental professionals involved with GA dentistry should consider how to advise parents on counselling their child about planned extractions prior to the appointment. However, overall, most parents described their children as generally happier after oral rehabilitation because of general improvement in well-being.

## **Conclusion**

Parents reported varying levels of anxiety during the GA. They expressed their emotions as “fear”, “worry”, and “concern”. While some parents felt “guilty” and struggled to accept this mode of treatment for their child, others felt “blameless” and were convinced that a GA is “preferable” and superior to conventional treatment. Overall, the GA dental experience had enough of an emotional impact to immediately motivate parents to consider changing their behaviours related to their child’s dental health. In fact, an “early” outcome of the GA was a reported improvement in parent’s and child’s dental health practices, but at the same time parents appeared to be overwhelmed by difficulties in applying new healthy behaviours.

Further understanding of the barriers and the challenges parents face to maintain dentally-healthy behaviours in the long term is needed. Follow-up interviews are required to explore parents’ long-term success with preventive behaviours. Only by enhancing our knowledge and better understanding of a parent’s ongoing struggle to “do the right thing” in relation to her/his child’s dental health, can more meaningful and, thus more successful, interventions be developed. This research is ongoing as we endeavour to follow up these parents over time.

## **Acknowledgments**

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## **Appendix 7-6 (Manuscript 2)**

### **CHANGE IN PARENTAL ORAL HEALTH PRACTICES FOLLOWING A CHILD'S DENTAL TREATMENT UNDER GENERAL ANESTHESIA**

A version of this chapter has been published in the **European Archives of Paediatric Dentistry**, was presented as a poster at the International Association of Dental Research (IADR) Annual Session, Baltimore, March 2005 and the abstract was published in a special issue of **Journal of Dental Research**.

Amin MS, Harrison RL: Change in parental oral health practices following a child's dental treatment under general anaesthesia. *European Archives of Paediatric Dentistry*, 7 (2): 116-120, 2006

Amin MS, Harrison RL, Weinstein P: Improving preventive dental practices following a child's general anaesthesia. *J Dent Res* 84, Special Issue A, Abstract #1959, 2005



## Introduction

Despite continued efforts to better understand the etiology of early childhood caries (ECC) as well as advances in prevention of this problem, children from disadvantaged communities and minority ethnic groups are disproportionately affected by ECC. Clinical management of ECC is often accomplished using general anaesthesia (GA), an expensive treatment modality that is not without risk. It is even more troubling that such large proportions of these children soon experience new caries, "caries relapse", and require a second "dental GA".<sup>1, 2</sup> Therefore, the event of general anaesthetic surgery to complete a child's dental work does not appear to be a "wake-up" call for parents to make significant changes in behaviours.

In order to develop acceptable and effective interventions to prevent caries relapse, we need to identify and understand the factors that place some children at risk to new caries after GA dental treatment. Parental beliefs and attitudes about dental health and prevention of disease either protect a child from, or place a child at risk to caries relapse.<sup>3</sup> The prevention and management of caries relapse requires the recognition of "risky" health behaviours and an understanding of how to promote positive healthy behaviours. Most previous analyses of parental beliefs and behaviours have been quantitative studies.<sup>3</sup> An exploratory qualitative approach will provide insight into the motivators and also into the barriers to behaviour change, as reported by parents. Such descriptive information will help us to better resolve parents' ambivalence about changing their behaviours related to their child's oral health. We have previously reported our findings related to parents' experience of their child's GA dental treatment.<sup>4</sup> The intention of this report is to explore:

a) those beliefs and behaviours of parents that place their child at risk to caries relapse, and b) readiness of parents to adopt new behaviours or change their existing behaviours to control the development of new caries.

## **Methods**

Approval for the study was received from the Behavioural Research Ethics Board of University of British Columbia, Canada. One-on-one, semi-structured interviews were conducted by the first author (MA) using an interview guide (**Table 1**). In addition, information on demographics, child's feeding, and child's dental history was recorded in a short questionnaire. Following each interview, the interview guide was modified as necessary in an iterative fashion based on responses.

Subjects were English-speaking parents from a variety of ethnic backgrounds whose children had recently been treated under GA at a paediatric dental practice with an on-site general anaesthetic suite. Although the dental centre is a private practice, the costs of treatment of many of the children, either with or without GA, are fully or partially supported by publicly-funded programs. Interested parents were interviewed individually at their child's scheduled follow-up appointment 7 to 14 days after the surgery. The interviews lasted between 25 to 50 minutes.

Interviews were audio-taped, transcribed, checked and coded into the *Nvivo* software program. The approach to data analysis was grounded theory.<sup>5</sup> The transcripts were read and reread carefully and codes were identified. A listing was made of all codes. Similar codes were grouped together to create clusters. Clusters were then reduced into

**Table 1 Original interview questions**

---

1. How would you describe a healthy mouth?
  2. What do you know about baby teeth?
  3. What were you thinking and feeling when your child was asleep and being worked on by the dentist?
  4. How is your child doing after the dental work?
  5. What did you learn from your experience?
-

**Table 2 Demographics of participants**

<b>Inclusion criteria</b>	English-speaking parents of children under 6 years of age in need of GA
<b>Number of participants</b>	11
<hr/>	
<b>Child</b>	
Age range	2.5-6 years
Gender	Female = 4    Male = 7
Birth order	First child = 5    Second child and beyond = 6
dmfs range	6-50
<hr/>	
<b>Parents</b>	
Gender	Mother = 8    Father = 3
Mother's age range	26-45 years

meta-clusters with labels and the labels became concepts. Similar concepts were grouped together to develop categories and subcategories.<sup>6</sup> Linkages were made among categories. 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.

## **Results**

Eleven participants were interviewed before data was determined to be saturated. Demographic information of the children and parents participating in the study is summarised in **Table 2**. Four main categories of interest were identified.

### **Parents' concept of oral health**

Parents' overall perceptions of oral health were absence of pain or other problems like bleeding gums, loose teeth, breath odour, or crowded teeth. However, "cavities" were their primary focus in relationship to dental disease. Although parents acknowledged the importance of dental health, they expressed doubt about the possibility of keeping teeth "cavity-free". Most parents were regular dental attenders. Dental fear related to past negative experience was not commonly reported by this group of parents. Responses indicated that parents valued "baby" teeth. They described inadequate oral hygiene, inappropriate feeding habits (prolonged breast or bottle feeding), and diets high in sugar as the most important factors leading to dental decay. However, the concept of caries as an "infectious disease" did not appear to be part of their thinking. "Baby" teeth were

described as being more likely to decay than adult teeth because of children's feeding habits and their poor cooperation with home-care practices.

### **Parents' practices regarding their child's dental health**

#### **Child feeding practices**

Most parents in this study talked about the detrimental effect of inappropriate breast or bottle feeding habits on their child's dental health. They correctly identified the relationship between sugary liquids in the bottle and tooth decay. Nevertheless, parents commonly reported that their child was breast or bottle fed beyond 18 months of age. They justified their child's dependency on the breast or bottle as a reflection of the child's need for "security":

*"they become very attached to it, just like a security. I didn't try to break them away."*

At the same time, they talked about their desperation and, therefore, failure in weaning. For these mothers, the bottle also provided an immediate comfort for their child. Some other parents linked prolonged bottle use to other factors. One father suggested his daughter was *"addicted to her bottle"*. On the other hand, a mother who successfully weaned her child from a bottle misunderstood the rationale for doing so, as she described:

*"After I stopped the bottle, I was still giving him milk in a cup in the middle of the night. I thought because it's not in the bottle, it would be fine."*

Nonetheless, there were other parents who simply took action and successfully weaned their child. Parents were also well aware of the cariogenic potential of sugary food and snacks, but, regardless, frequent sugar intake by the child was commonly reported:

*"Life is life and a child needs treats; when they do something really good, I give them a little bit (of) sugar (to make) them happy."*

### **Child oral hygiene practices**

Poor toothbrushing was commonly suggested by the parents as a cause of dental decay. While the importance of parental supervision was acknowledged, most parents admitted it was a struggle to brush their young child's teeth. Although almost all parents started to brush their child's teeth before 2 years of age, it seemed that most children were left to clean their own teeth around the age of 4 because of the child's persistent resistance.

### **Child's first dental visit**

Many of the children had pain and abscess formation at the time of referral for care. When queried about the recommended age for a child's first dental visit, some parents were not aware of the importance of an early dental visit. Other parents' attempts to visit a dentist had failed for a variety of reasons such as other family members' misunderstandings about baby teeth, child's temperament, cost, and access to dental care. As a mother of two boys said: *"I tried, but the dentists said he was too young; they couldn't see him until he is 3 years old"*

### **GA experience and cues to change**

The GA experience appeared to immediately motivate all of the parents to change oral health practices for their child. Parents seemed willing at this stage right after treatment to implement recommended preventive strategies. Other motivators to take action were also mentioned such as the health benefits to the child:

*"...teeth are related to their digestion and nutrition, so if they get "rot" they cannot eat many foods",*

mother's sense of responsibility:

*"I stopped the bottle because I wanted to be a good mom",*

and child's appearance and social interactions:

*"I want her to have beautiful teeth, especially when she is a girl."*

Despite this initial enthusiasm for change, several barriers and difficulties with compliance were vividly described.

### **Barriers to change**

#### **Related to the child**

All parents mentioned their limited control of eating habits and oral hygiene practices as a result of their child's temperament. Resistance from the child was reported as the most common barrier to toothbrushing. Parents were also concerned about the possibility of their child being malnourished and, thus, tended to indulge their child's food preferences:

*"She is a "picky eater". I cannot force her to eat healthy food."*

Parents also talked about influences of other children as another barrier:

*"It is even more difficult when another child drinks apple juice in front of my son."*

#### **Related to the parents**

Parents in this study had two different approaches to their child's resistance to healthy habits. The first group of parents, the "permissive" parents, accepted the fact that their child was "in control" and nothing could be done about it. The second group was parents who were determined to take control by applying more sophisticated strategies:

*"...I would stand by her and let her brush first, then I start singing or doing something to distract her, so I take over and brush her teeth."*



On the other hand, there were some mothers who simply admitted that they were “too busy” with other responsibilities like looking after other children in the family which affected caring for their child’s teeth. Poor understanding of the issue by other caregivers were also mentioned as a barrier to healthy practices.

### **Related to media and advertising**

The other difficulty parents faced in providing good nutrition for their child was the effect of the external world (media and advertising) on their child’s choices:

*“I try to avoid the sugary stuff, but they see them advertised on TV. I think that should be stopped.”*

### **Discussion**

We undertook a qualitative method of inquiry to better understand how the GA experience affected parent’s subsequent dental health behaviours. By the “GA experience” we are referring to the experience of referral for treatment, the consultation appointment, the “GA appointment” and the parent’s and child’s reaction to these events.

### **Parents’ beliefs and their child’s dental health**

Parents in this study valued baby teeth. They were aware of the relationship of diet and oral hygiene to caries and believed baby teeth to be more susceptible to dental caries than adult teeth. Losing a baby tooth because of tooth decay was also perceived by most parents as a serious problem. Nonetheless, inappropriate feeding habits and inadequate oral hygiene were consistently reported.

### **Child's feeding practices**

A consistent and significant association has been found between a child's inappropriate feeding habits and ECC.<sup>7</sup> Despite awareness of this association, some parents persisted with inappropriate habits. One hypothesis to explain this behaviour is that the prolonged breast or bottle feeding is closely linked to the mother-child interaction.<sup>8</sup> Indeed, in our study, some mothers appeared to be overly sensitive to their child's needs. They talked about the breast or bottle as a "security" for their child. Although, they were aware that their child no longer needed the nutrients from the breast or bottle for health, they persisted with the practice. Persistence in breast or bottle feeding may also be related to a mother's resistance to her baby's growing up, called by Stevens and Freeman "regressive mothering".<sup>8</sup> Another behaviour identified in our mothers was the use of breast or bottle feeding as a comfort for their child. This behavioural characteristic has been termed "convenience mothering".<sup>8</sup>

Sugary food is another recognised risk factor for ECC.<sup>9</sup> Parents influence their children's food preferences and intake patterns by the foods they make available and accessible to the child as well as their own eating style (food modelling).<sup>10</sup> In addition, some parents in our study admitted using sweets to pacify or reward their child. Giving sweets to children as reward is a ubiquitous practice worldwide.<sup>11</sup> Furthermore, similar to previous reports,<sup>12</sup> some of our parents also talked about the food preferences of their child as being an important consideration. Children tend to prefer foods high in sugar.<sup>10</sup> Inadequate parental knowledge of nutrition, adherence to cultural practices, and using sweets as rewards is likely to lead to poor eating practices over the child's life time.

### **Child's oral hygiene**

Toothbrushing with fluoride dentifrice is a basic preventive oral health behaviour for young children. Parents in our study had good intentions to properly brush their child's teeth and knew the value of toothbrushing. Although almost all parents said that they had started to brush their child's teeth before age 2, the majority of children were eventually left to clean their teeth by themselves because of the "child's resistance". While onset of brushing a child's teeth has been associated with the prevalence of caries in the primary dentition,<sup>13</sup> children who brush their own teeth without help have been shown to be more likely to develop dental caries than those who sometimes, or always, have their teeth brushed by an adult.<sup>14</sup>

The effectiveness of parental toothbrushing itself was also another issue that arose. Some parents in our study admitted that their technique became much better after having one session of "hands-on" training from a dental professional. In a recent study, a single dental health education session and toothbrushing instruction with mothers resulted in approximately a 25% reduction in mutans streptococci infection in young children.<sup>15</sup> Our findings confirm that parents not only should be encouraged to brush young children's teeth from an early age, but, in addition, they need training to develop proper skills. Dental professionals need to provide coaching, not just information.

### **Child's first dental visit**

For a variety of reasons, many parents did not consult a dentist at the currently recommended age for their child.<sup>16</sup> Furthermore, for those parents who took their toddler to a dentist, their dentist frequently postponed referral to a specialist practice until a more

advanced stage of disease. This finding suggests that promotion of an early dental visit is an important strategy that needs to be emphasized by all health care professionals who work with young children. Despite new guidelines many parents commented about their difficulties finding a dentist to see a child less than 3 years of age. Thus, dental professionals and trainees need to develop skills in screening the very young child.

### **Parental efficacy**

Adoption of and persistence with healthy behaviours are known to be significantly associated with parents' perception of actually being able to cope with the care of their child's teeth, i.e. their self-efficacy.<sup>17</sup> Overall, parents in our study demonstrated low self-efficacy related to control of their child's diet and success with toothbrushing. Parents' poor dental self-efficacy was also related to issues like their uncertainty about practical toothbrushing techniques, a self-reported "over-sensitivity" to the child's needs, and a general lack of family discipline. Developing interventions that increase parental self-efficacy by providing parents with the skills to manage specific child's behaviour problems may, in turn, help them to more effectively look after their child's oral health. Dental professionals can also help parents to improve their self-efficacy by developing skills in parent-based oral health counselling strategies.<sup>18</sup> Parents need our encouragement and support, not just information, to help them "do the right thing".

### **Parental motivators to behaviour change**

Parents responded to the GA with a variety of emotions: concern, fear, guilt. Immediately, parents responded to their feelings by taking action and engaging in preventive strategies. Almost all parents reported early improvements in their own and their child's oral health behaviours. Most children were pleased about their new, clean mouth and wanted to keep

it that way. The most common change mentioned by parents was improved toothbrushing. Most parents admitted that there were gaps in their knowledge before the GA. However, they felt more confident in the adequacy of the information acquired as a result the “GA experience.”

### **Barriers to take action**

Although action cues or triggers such as the GA experience play a major role in behaviour change, barriers obstruct the path for action.<sup>19</sup> In our study, most parents were quite overwhelmed by the difficulties of implementing healthy behaviours. Similar to other investigations of barriers to healthy behaviour,<sup>20</sup> the majority of parents of young children perceived their child’s temperament as the biggest barrier to success. Lack of time and availability of the mother and poor understanding by other caregivers (grandparents or babysitters) were also barriers to healthy behaviours. Socioeconomic status and the influence of the media were challenges for some parents. Parents need support from family, professionals and their community to overcome these barriers and make long term changes. Although, the desired outcome of health behaviour change is individual’s ability to act, to attain, and to maintain a positive state of health, parents need assistance from not only dental but from other health professionals to change their behaviours and to dismantle the barriers. Many of our parents suggested that health professionals like community health nurses and family physicians should be more sensitive to oral health issues when providing information for expectant and new parents. Easy access to information in an individualized, culturally competent format has been demonstrated to influence parents to make changes.<sup>21</sup>

## **Conclusion**

Despite having gaps in dental knowledge prior to the GA, parents reported confidence in the knowledge acquired as result of the GA experience. Parents also reported a positive attitude towards maintaining healthy primary teeth. In fact, self-reported improvements in dental health practices shortly after the GA were generally reported. However, difficulty and only partial compliance in following recommendations were frequently mentioned by most parents. Therefore, these "early" healthy behaviours are unlikely to be maintained over time. Long-term barriers and challenges that parents face in maintaining healthy behaviours over time will be explored in future follow-up interviews.

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## **Appendix 7-7 (Manuscript 3)**

### **A CONCEPTUAL MODEL OF PARENTAL BEHAVIOUR CHANGE FOLLOWING A CHILD'S DENTAL GENERAL ANESTHESIA**

A version of this chapter has been accepted for publication in the journal **Pediatric Dentistry** and was presented at the Canadian Academy of Paediatric Dentistry (CAPD) Annual meeting, Montreal, September 2006 and the abstract was published in the proceeding of the conference. An abstract has also been submitted to International Association of Dental Research (IADR), Annual Session, New Orleans, 2007

Amin MS, Harrison RL: A conceptual model of parental behaviour change following a child's dental general anesthesia. *Paediatric Dentistry*, 2006 (in press)

Amin MS, Harrison RL: Parents' experience of their child's dental general anaesthesia. *Mirror: Canadian Academy of Paediatric Dentistry Annual Session*, Abstract # 4, 2006

## Introduction

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

Many theories of health behaviour change, for example the Health Belief Model (HBM), hypothesize that four motivating factors/perceptions including perception of susceptibility to and severity of a disease, and perception of benefits of and barriers to taking action determine the likelihood of adopting a recommended preventive health action.<sup>7</sup> However, this approach is likely too simplistic. In addition to these motivating factors, other factors such as ethnicity, culture, family socioeconomic status, and environment need to be considered in understanding parental behaviours.<sup>8</sup> Another model that has relevance for understanding parent's health promoting behaviours for their child is the Transtheoretical Model (TTM).<sup>9</sup> This model proposes that behaviour 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 behaviour change has been made and maintained. Therefore, in order to

move individuals along the continuum of stages of behavioural change, it is critical to understand and identify the stage of “change” an individual is at and, then, to develop “stage-appropriate” intervention strategies and techniques.

A parent’s readiness to change may be closely connected to their style of parenting. Two important elements of parenting that have been described are parental responsiveness and parental “demandingness”.<sup>10</sup> 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.<sup>11</sup> Parental “demandingness”, i.e. behavioural control, refers to parents’ demands, supervision, and disciplinary efforts and their willingness to challenge their child.<sup>11</sup>

Based on these two elements, four parenting styles have been defined:<sup>11</sup> 1) *Permissive parents* are more responsive than they are demanding. They do not require mature behaviour, allow considerable self-regulation, and avoid confrontation. 2) *Authoritarian parents* are highly demanding and directive, but not responsive. They expect orders to be obeyed without explanation. 3) *Authoritative parents* are both demanding and responsive. They teach and supervise clear standards for their child’s behaviours. Their disciplinary methods are supportive, rather than punitive. 4) *Uninvolved parents* are low in both responsiveness and demandingness. While parenting style reflects different naturally-occurring patterns of parental beliefs, attitudes, and behaviours, 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 behaviours have been quantitative studies.<sup>12, 13</sup> An exploratory qualitative approach will provide insight into the

motivators and the barriers to behaviour change, as reported by parents, and will improve our understanding of strategies to facilitate change in parental behaviours. Such information may support dental professionals to better resolve parental ambivalence about changing behaviours related to their child's oral health.

The authors have previously reported their findings on parents' experience of their child's GA dental treatment and on parents' immediate behaviour change after the GA.<sup>14</sup>  
<sup>15</sup> The intention of this paper is to explore 1) parents' challenges to long term success in maintenance of healthy behaviours for their child, and 2) the responses of parents of children with new caries and the responses of parents of "caries-free" children at 6 month follow-up.

## **Methods**

Approval for the study was received from the Behavioural Research Ethics Board of University of 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 of many of the children, either with or without GA, were partially or fully supported by publicly-funded programs. All referrals to this specialty practice by general dentists were because of the child's behaviour management issues 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 original language. The consent form and the recruitment flyer were translated into Chinese and subsequently back-translated. All of the eight interviews were translated into English for analysis. Correctness of translations was verified by another Chinese bilingual individual. The interviews lasted between 25 to 60 minutes. In addition, information on demographics, child's feeding, and child's dental history was recorded in a short questionnaire. At the end of each interview, \$25 was given to each participant.

Interviews were audio-taped, transcribed, checked and coded using the *Nvivo* software program. 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.<sup>16</sup> As the research progressed, 63 codes were identified and grouped under six 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.

**Table 1** Interview questions

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**At GA 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 GA**

1. Why your child did/did not have new cavities at this time?
  2. What difficulties have you had to follow 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?
-

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 6 month recall appointment were termed to be "no-relapse". Families whose child had at least one new carious lesion at recall or families who had more than one child who had undergone GA for dental treatment were categorized as "relapse". To explore the long-term effect of the GA and to better understand parents differing journeys following their child's GA and their attempts to maintain the healthy behaviours over time, the first set of parents, cohort A was invited to a second interview 6 to 12 months after the GA. Based on parents' availability and acceptance, eight 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, Cohort B, whose children were in need of a second GA because of new caries, but had not been part of the first cohort, were also interviewed. The responses of the "no-relapse" families and the "relapse" families were further analysed and compared. In total, twenty six interviews were completed before data was determined to be saturated. 6.3

**Table 2** Study participants

	No-relapse (N=9)	Relapse (N=10)
<b>Child</b>		
Age (mean)	46.3 months old*	49.4 months old*
Gender	boys=3, girls=6	boys=7, girls=3
dmfs (mean)	25.1*	36.9*
Age bottle/breast feeding stopped	26.2 months*	32.2 months*
<b>Parent</b>		
Gender	fathers=2, mothers=7	fathers=2, mothers=8
Mother's age (mean)	36.9 years old*	37.9 years old*

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\* Because of the small sample size in qualitative research, statistics like SD are not usually presented



## 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.

### Parental 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 like consumption of sugary foods, inadequate oral hygiene, general health, genetics, and 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”. However, the “no-relapse” group did not seem to consider dental decay as an expected part of every day life. Although, some of them said (**Table 3**):

*“... it is acceptable because it's common”.*

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.

The “no-relapse” group seemed to value baby teeth somewhat more than the “relapse” group (**Table 3**).

**Table 3** Example quotes of dental beliefs of parents from “no-relapse” and “relapse” Group

Dental beliefs	No-relapse	Relapse
<b>Dental caries “normal”</b>	“Tooth decay is not normal but very common, so it is acceptable” <sup>i</sup>	“I think having cavity is normal, as long as there aren't a lot of cavities. It's impossible to not have caries for life”
<b>Dental self-efficacy<sup>ii</sup></b>	“I think I am able to prevent cavity, because I have some family members who don't have any cavity at all”	“I know that the teeth can be kept for lifetime. We can keep our teeth clean without any cavities, but I cannot”
<b>Value to baby teeth</b>	“I know that you have to care of the baby teeth because if baby teeth start getting cavities, the adult teeth coming are affected”	“...anyway, they're not permanent so why bother; when the permanent teeth are coming out then we should be careful”
<b>Susceptibility to dental decay</b>	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 adult because: “kids are careless and lazy”, “kids have lots of sweets”, and “kids don't brush”
<b>Parental self-efficacy<sup>iii</sup></b>	“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.”
<b>Responsibility</b>	“I know it's easier said than done, but we should realize that it's our responsibility not the problem of the child.”	“Well, he's responsible; 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.”

<sup>i</sup> Quotes from individual parents are as close to their own words as possible.

<sup>ii</sup> Dental self-efficacy is one's ability to control any kinds of dental problem.

<sup>iii</sup> Parental self-efficacy is exercising control over the child so that the child will be healthy.

However, the belief "childhood decay is quite prevalent" was common to both groups. All parents agreed that baby teeth are important for a child's eating, speaking, and appearance, but only the "no-relapse" group 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 parent's own poor childhood dental care, inadequate or incorrect knowledge, limited family income, and external influences (for example, access to dental services, commercial products). Although no parent reported their previous dental visits to be a pleasant experience, most of them were now regular dental attenders. Dental avoidance by parents was not a finding.

### **Experience of GA**

Parents were generally troubled that their child needed a 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 way to complete their child's treatment, even "preferable" for their child, and superior to conventional treatment.

The perceived benefits of a child's dental treatment with GA were explained as: 1) all treatment in one appointment with "instant" relief of pain; 2) safe treatment; 3) minimal discomfort to the child; 4) no cooperation required; 5) disease process stopped. However, parents also had concerns about the side effects of the GA "medicine":

*"... he might not awaken after the surgery."*

*"... it might affect my child's brain or his IQ."*

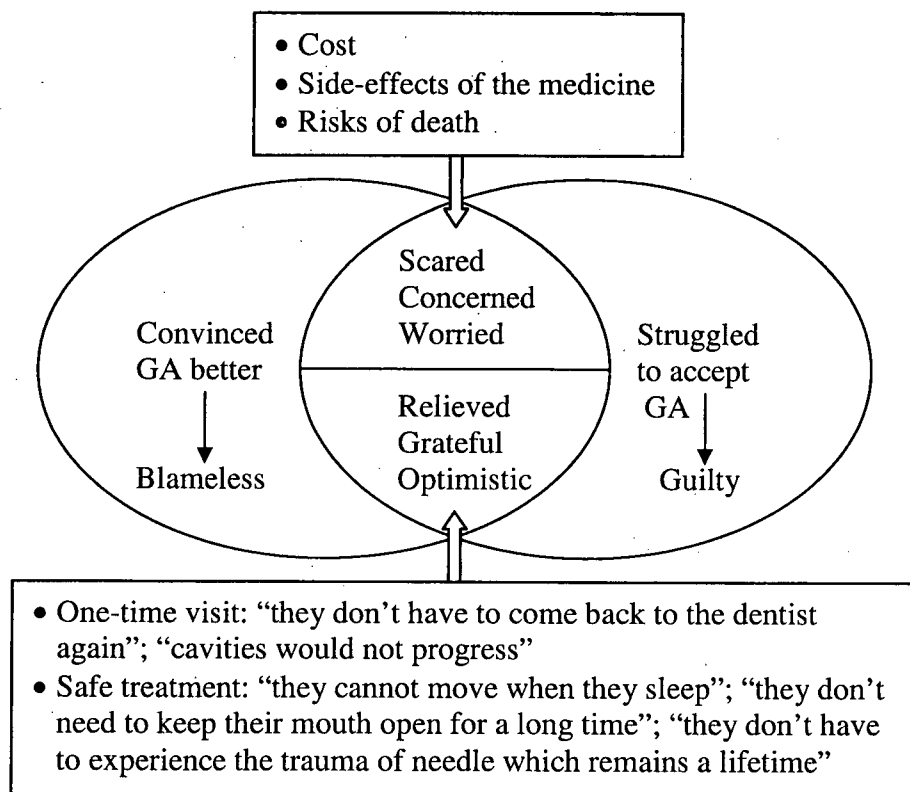
The cost of treatment was also mentioned as a concern (**Figure 1**).

### **Outcome of GA**

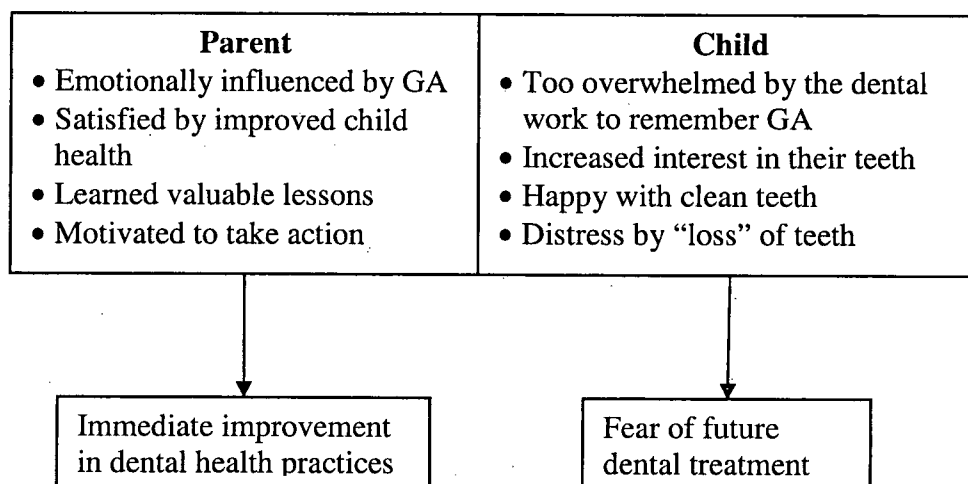
#### **Related to child**

When parents' thoughts on their child's reaction to GA were explored, other than two mothers in the "relapse" group, most parents believed that their child did not remember the GA appointment itself (**Figure 2**). However, a child's increased interest in having good teeth after the surgery 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 one-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 level of cooperation.

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



**Figure 2.** Short term outcomes of a dental GA



### **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". However, a new awareness of the importance of early dental visits and regular check-ups 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 behaviours.

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. However, the "no-relapse" families 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."*

### **Behaviour 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. However, parents seemed to be at different levels of readiness to be able to maintain positive changes over time. At one 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 behaviour (Table 4). They also expressed limited self-confidence in their ability to perform and maintain new behaviours 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.

### **Barriers to change**

Parents in both groups talked about their struggles with their child’s home-care 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 which 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 ...”*

*“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.



**Table 4** Stages of change in “no-relapse” group and “relapse” group

<b>Stages of change</b>	<b>No-relapse</b>	<b>Relapse</b>
<b>Pre-contemplation</b>		“We give them treats once a week when we get our grocery. His diet has not been changed that much; they love treats, I cannot stop them.”
<b>Contemplation</b>		“May be I should stop giving them candies, I don’t know, I cannot stop them, may be I should tell him stop eating candies. I don’t know if he accepts.”
<b>Preparation</b>	“They like candies; when we go shopping, we are aware that they want it, so we buy it for them; but we try not take them shopping with us, that way, there's no conflict.”	
<b>Action</b>	“I don’t buy candies or pop around the house. They’re not in my grocery list, like, I don’t replace them all the time.”	

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 such as the value of flossing their child's teeth, children's toothpaste, and 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 3 ½ 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 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 behaviours. They stressed that information alone is not sufficient for action. A mother of two 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 one 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 first dental visit, fluoride treatment, snacking, and 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 three 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 children's TV shows, brushing and snack-time programs at preschools, books and newspapers, and the expectation and the judgment of modern society on "how well people care for their body". They also asked for educational videos, pamphlets with pictures, public awareness programs and 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 grandparents, babysitter, friends, and families or "people" in general. A 34-year old mother of three 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 just about anyone. However, most families in both groups 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 behaviours.

### **Parenting style**

Participating parents demonstrated three recognized parenting styles.<sup>11</sup> To avoid confrontation, many “relapse” families seemed to be more “permissive” to 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 (**Table 5**). 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 behaviours 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 (**Table 5**).

**Table 5** Example quotes of “no-relapse” and “relapse” parents indicating their parenting style

Parenting styles	No-relapse	Relapse
<b>Permissive</b> low parental affection/ low behavioural control		“I told him once that juices are sweet and not good for him, he has to drink water, but he says: “water doesn’t have any taste”. They cannot drink water, so I have to give them juice.”
<b>Authoritarian</b> low parental affection/ high behavioural control		“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.”
<b>Authoritative</b> high parental affection/ high behavioural control	“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.”	

Overall, Chinese families no matter whether their child was “caries-positive” or “caries-free” at recall 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 if given a second chance whether they would do anything differently, 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 nine months or a year, and not waiting any longer.”*

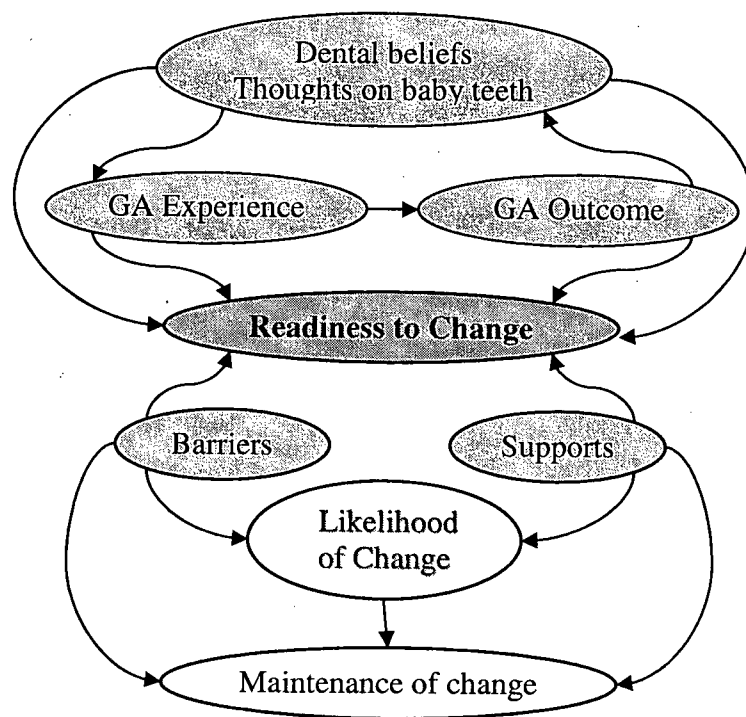
### **Discussion**

The etiology of ECC is complex, but parents’ beliefs and behaviours 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 behaviours as well as deeper insight into the motivators and barriers to behaviour 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 behaviours to prevent caries relapse and to improve their child’s oral health.

It is acknowledged that caries is a continuum and the diagnostic tests for caries used by clinicians in this study, visual and radiographic exams, are imprecise. Thus, the “no-relapse” group may get caries at a later date, but the “relapse” group demonstrated an increased rate of new caries at 6 month follow-up. The “GA experience” was defined as a set of events which were more than just the treatment appointment under GA. It was the experience of referral, the consultation appointment, the “GA appointment” and the parent’s and child’s reaction to these events that collectively comprise the “GA experience”.

The authors propose an explanatory model of parental behaviour change in **Figure 3**. The component elements of the model describing the process of change emerged from the data collected in this study.

**Figure 3** A conceptual model of parental behaviour change following a child's dental GA





### **Parents' beliefs about oral health**

Several factors related to parents' general beliefs and attitudes about oral health were identified in the interviews. The four motivating factors proposed by the HBM (perceived susceptibility to dental caries, perceived seriousness of losing teeth, perceived costs and benefits of prevention) 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 6.3**). These shared beliefs may explain why both groups of children developed caries in the first place.

However, parents 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 potential risks of carious teeth, the relationship between baby teeth and adult teeth, and the importance of preserving baby teeth. However, parents in the "relapse" group 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 preservation of 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 behaviours.<sup>17</sup> In the present study, parents in the "relapse" group seemed to be more ambivalent about their ability to control dental decay, i.e. dental self-efficacy, compared to parents in the "no-relapse" group. 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 professionals for the problem.

### **Behaviour 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 behaviours 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.<sup>14</sup> While behaviour 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 behaviour.<sup>18</sup>

In the present study, despite the initial enthusiasm for change and immediate improvement of parents' and their child's oral health behaviours, it was only those families who were furthest along the stages of change continuum who maintained positive behaviours over time. Parental readiness to change is a known determinant of the maintenance of health-promoting behaviours and of changing existing unhealthy behaviours.<sup>18</sup> Parents in the present study differed on a number of dimensions related to how they perceived the "costs and benefits" of behaviour 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 (pre-contemplation or contemplation stage). They had not yet resolved their ambivalence about the costs and benefits of behaviour 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 behaviour change and considered themselves to be capable of protecting their child from caries relapse. All parents talked about similar barriers to change; however, parents in the “no-relapse” group seemed to be more determined to find a way to eliminate and overcome the barriers and were more receptive to receive support from others.

### **Parenting Style**

Parents develop different styles to cope with their parenting struggles. Most parents use a combination of styles; however, one style usually predominates.<sup>19</sup> An authoritative parenting style has shown to be one of the most consistent predictors of healthy family behaviours.<sup>20</sup> 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. However, controlling a child’s eating habits 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 not only dental, but also the general health of a child.<sup>21</sup>

### **Supports to change**

In the present study, most parents admitted that they were deficient in their knowledge before the GA. However, they all reported a better understanding of caries risk factors after the “GA experience” and felt confident in the adequacy of their new information.<sup>15</sup> Nonetheless, new healthy behaviours 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 behaviours in order to protect their child from relapse.<sup>22</sup> 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 non-dental professionals in order to handle these challenges and maintain their new healthy behaviours. 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 regarding 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 behavioural intervention that dental professionals should consider to enhance the effectiveness of preventive strategies.<sup>23, 24</sup>

## **Conclusion**

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

1. Although an “early” and positive outcome of the GA experience was a reported improvement in dental health practices, it did not appear to affect long-term preventive behaviours for most parents.
2. Readiness to change was an important predictor of whether parents engaged in preventive methods and maintained the acquired healthy behaviours over time.
3. Oral health counselling should include an assessment of parental readiness.
4. To avoid the conflict of information that parents experienced, other health professionals need to become actively involved in efforts to promote young children’s oral health.

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