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# Early Childhood Caries: Parent's Knowledge, Attitude and Practice Towards Its Prevention in Malaysia

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## 1. Introduction

Early childhood caries (ECC) is defined as the presence of 1 or more decayed, missing or filled tooth surfaces in any primary tooth in a child 71 months or younger (Drury et al., 1999). ECC is the most common chronic disease in young children and may develop as soon as teeth erupt (Douglass et al., 2004). It is a significant public health problem and certain segments of society, such as the socially disadvantaged have the highest burden of disease (Vargas & Ronzio, 2006). In the US, although prevalence of caries was decreasing overall, the severity was increasing in these groups of people (Douglass et al., 2002).

A number of risk factors are associated with ECC, which can be broadly classified into biological and social risk factors (Berg & Slayton, 2009). Biological risk factors include nutritional variables, feeding habits and early colonization of cariogenic micro-organisms. Social risk factors comprise low parental education, low socio-economic status and lack of awareness about dental disease (Hallett & O'Rourke, 2003). ECC affects the quality of life of families and their affected children due to dental pain and subsequent tooth loss resulting in difficulty in eating, speaking, sleeping and socializing (Edelstein et al., 2006; Pahel et al., 2007). Treatment of ECC has numerous inherent difficulties. It is costly (Casamassimo et al., 2009; Kanellis et al., 2000) and takes up time of the child and caretaker (Casamassimo et al., 2009; Vargas & Ronzio, 2006). Not all dentists are trained to handle children and many general practitioners are not keen to treat young children (Vargas & Ronzio, 2006). Treatment necessitates extensive rehabilitation under general anaesthesia and recurrence rates of caries are high thus requiring retreatment (Almeida et al., 2000; Tate et al., 2002). Hence the dental profession favours a preventive approach towards management of ECC (Ismail, 2003; Vargas & Ronzio, 2006). The earliest form of prevention can be achieved by educating parents and primary caregivers about ECC. Preventive guidelines towards ECC are found in many countries and most have their own individualized programs which aim at training parents to recognize ECC early and seek treatment. Anticipatory guidance is one of the approaches used at antenatal visits and for new mothers (Meyer et al.; Plutzer & Spencer,

2008). Age-one dental visit (Savage et al., 2004) and “Lift-the-lip” training are undertaken in some countries as an approach to identify ECC at its earlier stages (Alexander & Mazza).

Establishing good oral health in the early years is important for a lifetime of good oral health (Clarke et al., 2001). Tooth brushing activity fell far short of professional expectations in parents and toddlers when observed using home-based videotaped sessions, although parents thought the sessions were effective in achieving clean teeth (Zeedyk et al., 2005). Hence, improving oral hygiene in early childhood requires that mothers’ own tooth brushing habits and their infant oral cleaning skills are improved (Mohebbi et al., 2008). Infant feeding practices were also found to be poor in South East-Asian countries like Taiwan (Tsai et al., 2006), Myanmar (van Palenstein Helder et al., 2006) and Korea (Jin et al., 2003) with increased indulgence to between-meal snacks, sweetened solution in nursing bottle, sweets and prechewed rice. Many studies have concluded that parents are in definite need of advice on feeding and oral hygiene practices (Singh & King, 2003). Prevention is the key for ECC, and can be achieved successfully by knowledgeable and efficacious caregivers (Finlayson et al., 2005). It is suggested that other models for disease initiation and progression needs to be explored besides known risk factors such as poor oral hygiene and diet control (Hallett, 2000). Children living in stressful environments or without parental support could be at a higher risk for developing ailments such as dental caries (Mattila et al., 2000). The family dynamics can play a major role in the oral health of children (Da Silva, 2007).

Oral health literacy is the degree to which individuals have the capacity to obtain, process, and understand basic oral health information and services needed to make appropriate health decisions (Berg & Slayton, 2009). Parents’ literacy in oral health is an important factor contributing to the overall health of children (Da Silva, 2007). Caregivers of children with ECC were more likely to believe that caries could not affect a child’s health while those who believed primary teeth are important had children with significantly less decay (Schroth et al., 2007). Parental knowledge about infant oral health was found to be lacking in many studies (Blinkhorn et al., 2001; Gussy et al., 2008; Hoeft et al., 2010; Orenuga & Sofola, 2005; Singh & King, 2003). The factors associated with decreased knowledge and poor attitudes among primary caregivers of children include low socioeconomic status (Dykes et al., 2002; Finlayson et al., 2007), living in deprived areas (Silver, 1992; Williams et al., 2002), ethnicity or immigrant status (Skaret et al., 2008; Williams et al., 2002), lack of further education (Szatko et al., 2004; Williams et al., 2002), high caries status in the children (Szatko et al., 2004) and difficult past dental experience (Tickle et al., 2003) among others. However, oral health specific self efficacy and knowledge measures are potentially modifiable cognitions and interventions can lead to healthy dental habits (Finlayson et al., 2007).

Oral health surveys of 5 year-old and 6-year-old pre-school children in Malaysia showed a high caries prevalence of 76.2% and 74.5% in 2005 and 2007 respectively (Oral Health Division, 2007, 2009). With the existence of the preschool program since 1984 (Oral Health Division, 2003) and the program for antenatal mothers since early 1970’s (Oral Health Division, 2004) among other strategies, Malaysia aims to achieve its objective of 50% caries-free 6-year-old’s by 2020 (Talib, 2010). Since infants and toddlers are not in control of their oral health, the parental role is of utmost importance. We hypothesize that the problem of high prevalence of ECC in Malaysia may be due to poor knowledge, attitudes and practice towards factors associated with ECC. So far, one study done in Serdang, Malaysia found that parents of children with early childhood caries had adequate knowledge and positive attitude towards maintaining satisfactory dental care in their pre-school children

(Syahrial et al., 1995). However, practice among these parents was not evaluated. The aim of this study was to assess the existing knowledge, attitude and practice of early childhood oral health related factors among parents of infants and toddlers in Kelantan, Malaysia.

## 2. Materials and methods

A thirty-item close-ended questionnaire, consisting of ten items each addressing knowledge, attitudes and practice of early childhood oral health related factors was designed jointly by the research group which included a pediatric dentist and community dental health specialist. All aspects of early childhood oral health including oral development, diet, nursing habits, oral hygiene habits, fluoride, transmissibility of oral bacteria, importance of primary teeth and attitude towards acquiring new knowledge were addressed in the questionnaire. The scoring in the knowledge domain included true/false/don't know component, while the attitude and practice domain used a 5 point and 4 point Likert scale respectively. Some items in the practice domain did not follow the likert scale. A section for socio demographic data was included at the beginning of the questionnaire to assess the socioeconomic status, educational level and occupation of the primary caretakers. The questionnaire was constructed in English and later translated into Bahasa Malaysia, the local language and back-translated to English. The instrument was pretested on 5 randomly selected subjects before the conduct of the study.

In this cross sectional study, 120 parents of infants and toddlers aged 6 months-2 years attending four public Maternal and child health care clinics in the state of Kelantan, Malaysia were randomly selected and invited to participate in the study. Children are usually brought by parents to these centers for immunization. Inclusion criteria were parents of normal healthy children aged between 6 months and 2 years who were the primary caretakers of their children. Parents who were not the primary caretakers of the children or who had children with medical problems were excluded. After obtaining written consent from the participants, the self administered questionnaires were given out. The participants were requested to return the questionnaires immediately upon completion. The subjects who required help in reading were assisted. The ethical clearance was obtained from the Human Ethics Committee of Universiti Sains Malaysia. The data was entered into SPSS software, version 12.0 (SPSS Inc, Chicago, 2001) for analysis.

## 3. Results

A total of 102 out of 120 questionnaires were returned (response rate of 85%). The demographic data of the respondents is presented in Table 1. The majority of the respondents were female (92%), Malay (99%), and homemakers (71%). Sixty nine percent had secondary education and 45% were in the moderate income group.

Table 2 shows the response of the participants to ten knowledge questions. While majority of parents (92%) knew when the first tooth erupted in the mouth, not that many (62%) were sure of when all the 20 teeth should be present in their child's mouth. About half of the parents knew (49%) that caries can affect infants below 2 years old. Almost all respondents knew the types of food causing dental caries and the importance of brushing children's teeth. Fewer parents (81%) knew that children's mouth should be cleaned before teeth erupted. About 78% of the parents knew that weaning from the bottle should start at 1 year

of age. Most parents (85%) knew that fluoride is important for preventing tooth decay and about half of them (52%) knew that they should start using toothpaste with fluoride for cleaning their child’s teeth when the child learns to spit. Sixty four percent knew that it is necessary to do fillings in their baby’s teeth.

<i>Variables</i>			<i>n</i>	(%)
Sex	Male		10	(9.8)
	Female		92	(90.2)
Ethnicity	Malay		99	(97.1)
	Chinese		3	( 2.9)
Age in years	Range -	19-42		
	Mean -	31.8		
	Mode -	34		
Marital Status	Married		101	(99)
	Single		1	(1)
Occupation	Male	working outside the home	10	(9.8)
	Female-	Homemaker	72	(70.6)
		Working outside the home	18	(19.6)
Household income*	Low income (<RM 699)		38	(37.3)
	Moderate income (RM 700-1611)		46	(45.1)
	High income (> RM1612)		18	(17.6)
Educational level	Primary		12	(11.8)
	Secondary		70	(68.6)
	Tertiary		20	(19.6)

\* Income group classification based on The 8<sup>th</sup> Malaysian Plan  
RM- Ringgit Malaysia

Table 1. Demographic data of the participants

Table 3 shows the attitude of the respondents to early childhood oral health related factors. The responses ‘strongly agree’ and ‘agree’ & ‘disagree’ and ‘strongly disagree’ were grouped together. About 22% and 43% of the parents thought that children should visit the dentist at 1 year and 3 years respectively, while 25% thought that it is sufficient to visit the dentist when there is a problem such as pain (data not shown). Almost all parents also agreed that a balanced diet is important for healthy teeth. Most parents (73%) thought that tooth decay is not caused by bacteria that are transmitted by sharing feeding utensils and 49% of them thought that night time bottle/breast feeding cannot cause tooth decay. More than half of them (64%) thought that frequent and prolonged breast/bottle feeding in the day time cannot cause tooth decay. Fifty two percent thought that effective cleaning of teeth can be achieved by the child him/herself. Many (46%) were not aware that swallowing of toothpaste can be harmful to a child’s health. Seventy percent of parents agreed that pacifier use can affect the normal development of children’s teeth.

<i>Knowledge items</i>	<i>True (T) n(%)</i>		<i>Don't know(N) n(%)</i>		<i>False (F) n(%)</i>	
Tooth decay can affect infants below 2 years of age	50	(49.0)	11	(10.5)	41	(40.2)
When does the first baby tooth appear the child’s mouth?	94	(92.2)	4	(3.9 )	4	(3.9 )
Your child will have a complete set of 20 milk teeth by the age of...	62	(62.0)	11	(10.8)	29	(28.4)
The main types of food that can cause tooth decay are..	101	(99.0)	1	(1.0 )	0	(00.0)
Weaning from a baby bottle to a sipping cup should be planned when the child is ...	80	(78.4)	6	(5.9 )	16	(15.7)
Cleaning your baby’s mouth after each should begin even before teeth erupt.	83	(81.4)	6	(5.9 )	13	(12.7)
Brushing your baby’s teeth is important for oral health.	102	(100 )	0	(00.0)	0	(00.0)
Fluoride in toothpaste is important for preventing tooth decay.	87	(85.3)	11	(10.8)	4	(3.9 )
You should start using toothpaste with fluoride for cleaning your child’s teeth:...	53	(52.0)	12	(11.8)	37	(36.3)
It is not necessary to do fillings in baby’s teeth.	24	(23.5)	13	(12.7)	65	(63.7)

Table 2. Knowledge of the respondents

<i>Attitude items</i>	<i>Strongly disagree /Disagree n (%)</i>		<i>Don't know n (%)</i>		<i>Strongly agree/Agree n (%)</i>	
Tooth decay is caused by bacteria that are transmitted by sharing feeding utensils (eg: spoon)	74	(72.6)	9	( 8.8)	19	(18.6)
When do you think you should take your baby for a dental check up after the teeth erupt?	25	(24.5)	11	(10.8)	66	(64.7)
A balance diet is essential for the healthy growth of a baby's teeth	1	(1.00)	3	(2.9 )	98	(96.1)
Night time bottle/breast feeding can cause tooth decay	50	(49.0)	18	(17.6)	34	(33.3)
Frequent and prolonged breast/bottle feeding in the day time can cause tooth decay	65	(63.7)	17	(16.7)	20	(19.6)
A child`s teeth should be cleaned/brushed as soon as the teeth erupt	8	( 7.9)	4	(3.9 )	90	(88.3)
Effective cleaning of teeth can be achieved by the child him/herself	45	(44.2)	4	(3.9 )	53	(51.9)
Swallowing of fluoride toothpaste can be harmful to a child's health	47	(46.1)	32	(31.4)	23	(22.5)
It is important for a child to visit the dentist before 2 years old.	24	(23.5)	16	(15.7)	62	(60.8)
Prolonged used of pacifier can affect the normal development of a child's teeth.	14	(13.7)	17	(16.7)	71	(69.6)

Table 3. Attitude of the respondents

Table 4 summarizes the practice of early childhood oral health related behaviors among parents. Fourteen percent of parents never examined their children’s mouth. A considerable number of parents (67.6%) practiced biting food into small pieces before giving the child. There were only 11.8% of the parents who never bought sweetened food for their baby. About half of the parents (45%) gave sweetened liquid or juice in the bottle to their children.

About 47% of the parents always practiced giving plain water after feeding the child. Semisolid food was started at one year of age in 38% of the children. Sixty percent of parents regularly brushed their children's teeth and 11% used full brush length amount of toothpaste to brush their child's teeth.

<i>Practice items</i>	<i>Never n (%)</i>		<i>Sometimes n (%)</i>		<i>Often n (%)</i>		<i>Always n (%)</i>	
Do you bite the food into small pieces before giving to your child?	33	(32.4)	44	(43.1)	12	(11.8)	13	(12.7)
How often do you examine the mouth of your baby?	14	(13.7)	47	(46.1)	17	(16.7)	24	(23.5)
How often do you buy sweetened food for your child?	12	(11.8)	80	(78.4)	7	(6.9)	3	(2.9)
How often do you give sweetened liquid/juice to baby in bottle?	56	(54.9)	35	(34.3)	7	(6.9)	4	(3.9)
How often do you give plain water after each feed?	5	(4.9)	16	(15.7)	33	(32.4)	48	(47.1)
When did you start semisolid food for your child?	16	(15.7)	16	(15.7)	39	(38.2)	31	(30.4)
How often do you brush your baby's teeth?	2	(2.00)	12	(11.8)	27	(26.5)	61	(59.8)
How much toothpaste do you use to brush your child's teeth?	3	(2.90)	11	(10.8)	46	(45.1)	42	(41.2)
Do you use pacifier dipped into sweet liquid for your child?	100	(98.0)	0	(00.0)	1	(1.00)	1	(1.00)
Do you take the effort to improve your dental health knowledge?	13	(12.7)	37	(36.3)	8	(7.8)	44	(43.1)

Table 4. Practice of the respondents

4. Discussion

Oral disease, predominantly caries in young children can be prevented to a great extent if parents are sufficiently educated and motivated. Oral health literacy is one of the important factors affecting oral health. Poor health literacy is associated with poorer

perceptions of health, decreased utilization of services and poorer understanding of verbal and written instructions of self-care (Jackson, 2006; Yin et al., 2009). Maternal attitude is significantly correlated to the oral health of their children (Abiola Adeniyi et al., 2009; Wigen et al., 2011). Parents of caries-free children had more positive beliefs and attitudes than those with caries when studied over a period of time (Skaret et al., 2008). Hence the assessment of knowledge, attitude and practice among primary caretakers of young children can indicate knowledge areas that are deficient and attitudes and practices that are erroneous.

In this study, 99% of parents knew the types of food that can cause tooth decay, yet, 45% of parents gave sweetened liquid in the bottle. In addition, about 49% parents disagreed that nighttime bottle/breastfeeding can cause dental caries and 64 % did not think that frequent daytime bottle/breast feeding caused tooth decay. It is apparent that parents knew that sugars in the diet can cause dental caries, but were not aware of hidden sugars and their effects. In other studies, urban Mexican American and immigrant Latino mothers rarely recognized cariogenic food beyond candy and demonstrated uncertainty as to how exactly bottle feeding is detrimental to oral health (Hoeft et al., 2010; Horton & Barker, 2008). In another study, ninety eight percent of children had juice in bottles or sippy cups (Southward et al., 2006). In Hong Kong, 60% gave fruit juices in bottles, some consuming non-dairy products more than six times per day (Chan et al., 2002). Bottle feeding was also highly prevalent in the above study, with majority having the bottle at naptime. Generally, parents of children with ECC were significantly more likely to disagree that nighttime nursing was safe, proving that knowledge among parents is high, but not reflected in the dental health of their children (Schroth et al., 2007). In another study, parents had good knowledge of diet related risk factors, but half the children were given bottle at bedtime (Gussy et al., 2008). However, poor knowledge was noted in Wu-Han, China (Petersen & Esheng, 1998) where only 42% of mothers knew that dental caries is caused by sugar while only 39% of mothers in Romania (Petersen et al., 1995) knew that dental caries is caused by sugar. In most studies, few could identify the diet with hidden sugars (Hoeft et al., 2010; Horton & Barker, 2008; Petersen et al., 1995).

Prolonged duration of bottle use put a population of low income Latino preschool children at increased risk for ECC (Hoeft et al., 2010). In our study, almost one-third (32%) of mothers initiated semisolid food after 1 and half years of age and 15.7% thought that bottle should be stopped after two and half years, indicating prolonged bottle/breast feeding beyond the recommended 1 year of age. Hence, this population is clearly at risk for ECC, but this could not be confirmed since no clinical examination was done. Similar findings of prolonged bottle feeding up to 2 years in 73% of the children were also reported from Hong Kong (Chan et al., 2002). Yet in another study, the children were weaned from the bottle during the day, but continued nighttime bottle feeding (Riedy et al., 2001). Another Asian study showed an increased risk for ECC due to prolonged duration of breast-feeding (van Palenstein Helderman et al., 2006). In some studies, mothers indicated that other caregivers encourage use of the bottle/sugar in diet when the mothers were away at work, even though mothers were not in favor of such practices (Amin & Harrison, 2009; Riedy et al., 2001).

Customarily, oral health education messages refer to kissing and sharing of utensils as the primary method of vertical transmission of oral bacteria. Knowledge of transmissibility of oral bacteria is minimal in this study population since 72.6% disagreed that bacteria can be

transmitted by sharing feeding utensils. In addition, 67.6% of parents practiced biting hard food into small pieces before giving it to the child. Tasting food before giving it to the child was practiced at least sometimes by most respondents in rural Australia (Gussy et al., 2008). Mothers also did not mention the role of bacteria in other studies (Gussy et al., 2008; Hoeft et al., 2010). On the other hand, mother's of children who underwent treatment of ECC under GA showed better knowledge of oral bacteria in the etiology of ECC (Amin & Harrison, 2009).

Cleaning a child's mouth should begin before teeth erupt and tooth brushing is recommended when the first tooth erupts at least once daily till 2 years and subsequently twice daily (Berg & Slayton, 2009). Generally, mothers with higher confidence in brushing their children's teeth and with higher frequency of brushing themselves had children with cleaner teeth (Gussy et al., 2008; Mohebbi et al., 2008). Those children who started tooth brushing earlier also have less caries (Chan et al., 2002). In this study, it was very encouraging to note that all parents in this study knew that brushing is important for baby's teeth, 81.4% parents knew that a baby's mouth should be cleaned even before the teeth erupt, 88% agreed that they should brush their baby's teeth as soon as it erupted. About 60% and 27% of the parents reported brushing their child's teeth twice and once daily respectively. However, 52% thought that effective cleaning can be achieved by the children themselves. Similar results were seen in other studies (Gussy et al., 2008). Most children aged 3 years and below in another study were allowed to brush their own teeth (Chan et al., 2002). Many studies have revealed that most mothers are aware that poor oral hygiene is a cause for caries (Blinkhorn et al., 2001; Gussy et al., 2008; Hoeft et al., 2010; Szatko et al., 2004), while other studies discovered that mothers did not place enough emphasis on tooth cleaning (Hood et al., 1998). Tooth brushing was reportedly delayed in some instances, where child temperament did not allow the parent clean teeth (Blinkhorn et al., 2001; Hoeft et al., 2010; Riedy et al., 2001).

Generally, the use of fluoridated toothpastes was known by mothers as useful in preventing tooth decay (Gussy et al., 2008; Schroth et al., 2007; Szatko et al., 2004). Studies have shown that many parents are not clear as to whether fluoride should be used in young children and how much should be used (Blinkhorn et al., 2001; Gussy et al., 2008). Our study showed that 85.3% of parents knew that fluoride in toothpaste is important for preventing caries in teeth, however, 46% disagreed that swallowing of fluoride toothpaste is harmful to the health and 31% were not sure of its harmful effects. Forty one percent and 45% used smear and pea-size amount of toothpaste respectively, while 11% used full length toothpaste. Hence, majority of the parents were familiar with the correct amount of toothpaste to be used. This could be due to the fact that most fluoridated toothpaste tubes have printed instructions on the cover which are easy to follow, but the rationale behind the guidelines are not apparent to the parents, since they were not aware of the harmful effect of the fluoride. Majority of the respondents used the correct amount to toothpaste in other studies also (Gussy et al., 2008), while only 41% used pea-size amount in another study (Blinkhorn et al., 2001). In Wu-Han China, only 43% of mothers knew that dental caries can be prevented by fluoride (Petersen & Esheng, 1998).

Attitudes towards importance of primary teeth vary among parents. In rural Australia (Gussy et al., 2008), all parents agreed that their child's teeth were important, while in Manitoba (Schroth et al., 2007), 4.2% disagreed that primary teeth are important. In our

study, 63.7% of parents knew that it is necessary to do fillings in baby's teeth, similarly, almost half of the mothers (47%) wanted their child's decayed teeth to be filled in the UK (Blinkhorn et al., 2001). On the other hand, another study in the UK revealed that only 6% of mothers wanted their child's asymptomatic primary tooth to be filled (Tickle et al., 2003), and two-thirds of mothers in Poland opined that care of deciduous teeth was unnecessary (Szatko et al., 2004).

In Malaysia, community programs to promote oral health instituted by the Ministry of Health are in place for a number of years, for example: school dental service (started from 1950) and oral health care for antenatal mothers program (since 1970s) (Oral Health Division, 2004). All subjects (ages range from 19-41) in this study should have undergone at least one dental health program at some time or the other and this explained the higher levels of knowledge when compared to some other studies. In July 2008, the Oral health division of the Ministry of health Malaysia launched the Early Childhood Oral Healthcare program with the slogan 'Never too early to start' (Oral Health Division, 2008). The primary target group was primary health care providers with the aim of educating parents attending the public health clinics, childcare providers and health personnel about early childhood oral health. The objective of this program was to create awareness of various preventive aspects of early childhood oral health, early dental visit at age one, improved dietary and nursing habits, oral hygiene habits to be inculcated in early childhood and the appropriate use of fluoride. Early identification of ECC was encouraged using the 'lift the lip' examination of maxillary anterior teeth and further referrals encouraged. Since this is a recently launched program, the full outcome is unlikely to have taken full effect at the time of this study.

The results of this study show that knowledge is not necessarily translated into good practices, indicating lack of motivation among parents (Berkowitz, 2003), as seen in other studies (Amin & Harrison, 2009; Rajab et al., 2002; Syahrial et al., 1995). Cultural practices specific to the region can be one of the obstacles to improvement in attitudes and oral health practices among the public (Amin & Harrison, 2009; Ismail, 2003). Different cultural backgrounds should be evaluated in separate cultural contexts (Skaret et al., 2008). Certain practices exist over many generations and remain persistent, many times overriding information obtained through books, media pamphlets, brochures and advertisements. In one study, prolonged breast feeding was practiced in Pohnpean women for purposes of birth control (Riedy et al., 2001). Weaning from the bottle was at 2-3 years, since it was child-centered and not based on knowledge gained through other sources (Riedy et al., 2001). In one study, professional advice regarding dietary practices was considered unrealistic and too complicated and believed that sugars had an important place in the life of the child (Amin & Harrison, 2009). In our study, it was noted that parents had the habit of biting hard food into smaller pieces before giving it to the child. A similar practice of mothers feeding their children rice that was pre-chewed by them for 20 seconds has been reported in a previous study and is probably a cultural practice of the south-east Asian region. In the above mentioned Myanmar community, ECC was considered inevitable and parents were not aware of the etiology (van Palenstein Helderman et al., 2006). Hence culturally appropriate and targeted strategies aimed at these modifiable practices need to be wisely promoted so that the oral health burden carried by these children can be reduced (Amin & Harrison, 2009; Schluter et al., 2007).

Other reasons for poor attitude and practice may be varied viz, inadequate time to deal with children, in cases of working parents, single mothers or large families and other social problems. This is in line with other studies which found that social problems can be a causative factor for caries and the family dynamics is an important aspect to be considered with regard to ECC (Amin & Harrison, 2009; Mattila et al., 2000). This is one aspect of ECC that needs to be further explored. One of the problems faced by parents of the 21<sup>st</sup> century is the free access of sweets to young children, either through close family and friends or through pocket money obtained by the children at an early age (Roberts et al., 2003). Hence a considerable majority of the parents have less control when it comes to the intake of sweets of their children. However, this may not apply to ECC, where the child is too young to exert his/her own independence. Furthermore, with modern day media exposure, commercials can distort or convey contradicting messages to the public, leaving them perplexed, which may explain why 52% of parents thought that effective cleaning of teeth can be achieved by the child himself/herself. On the other hand, we can assume that the public is not informed about details of prevention, for example: implicating that sweetened food causes caries but not being aware that feeding milk at night (which has hidden sugar) can also cause caries. These facts point to the need for further and continued dental awareness programs, highlighting more accurate and detailed information on preventive measures.

The limitation of this study was the small number of subjects. Further studies with larger samples can help clarify and motivate necessary policy changes. In addition, as stated by Hawley and Holloway (Hawley & Holloway, 1994), this approach to assess knowledge, attitude and practice can be notoriously inaccurate, for when approached face to face by a professional person; subjects will attempt to say what they knew, rather than what is in fact practiced.

## 5. Conclusion

We concluded that parents showed relatively good knowledge, but poor attitude and practice towards the oral health of their children. It is possible that parents are not informed about the details of oral disease and how it is caused. As previously suggested, in-depth education about caries etiology is more likely to bring about behavior change in parents (Hoeft et al., 2010). Consequently, more effort is required to improve knowledge, attitude and practice of oral health among parents and caretakers. However, some aspects of knowledge were better than other countries, especially knowledge about dietary factors causing caries. Health education should focus on parental responsibilities for oral health and mothers should be encouraged to give practical and emotional support to their children with regard to oral hygiene habits. Cultural practices of this region were evident in the practices of this population. Focus on modifying these behaviours will require considerable effort on the part of health educationists. Further studies should assess social concerns and study family dynamics.

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