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Parental knowledge and practices regarding their children´s oral health in Kuwait

ABSTRACT

Aim *The purpose of this study is to assess the knowledge and practices of parents toward their children's oral health in Kuwait.*

Materials and methods *Study Design: A cross-sectional study was conducted among 300 parents who visited five dental specialty centers in Kuwait. Data were collected through a self-administered questionnaire. Statistics: The statistical analysis was performed using SPSS software (version 21; Inc., Chicago IL, USA). Data were descriptively analysed, and a chi-square test was used to determine whether each individual question varied across different sociodemographic characteristics. The overall mean knowledge and practice scores were calculated. Statistical significance was set at p ≤ 0.05.*

Results *The study results revealed poor parental knowledge and practices with regard to their children's oral health. Oral hygiene and feeding practices were found to be disappointing. Major weakness were observed in infant oral health-related concepts including transmission of cariogenic bacteria, nocturnal bottle feeding, and the time of the first dental visit. However, most parents identified the meaning of gum bleeding and the role of bacteria in causing it. Furthermore, participants demonstrated positive role in their children's daily oral hygiene. A significant better knowledge was detected among female subjects in areas like bacterial transmission (P = 0.031) and aetiology of gingivitis (P = 0.001). Additionally, caregivers residing in Capital governorate showed a significantly better knowledge in bacterial transmission (P = 0.000) and meaning of bleeding gum (P = 0.001) and a significantly better practice with regard to the introduction of hot food to the child for the first time (P = 0.000).*

Conclusion *Parents in Kuwait seemed to have weak knowledge and practices with regard to their children's oral health. Coordinated efforts by health professionals, including paediatricians and paediatric dentists, are required to increase parental awareness regarding oral hygiene habits, diet and feeding practices, and to promote early preventive visits to the dentists.*

Keywords *Children oral health; Child-feeding practices; Parental oral health related knowledge.*

Introduction

Early childhood caries (ECC) is a serious yet preventable public health problem worldwide, particularly in developing countries [Bagramian et al., 2009]. This form of rampant caries is defined by the American Academy of Pediatric Dentistry (AAPD) as "the presence of one or more decayed (noncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child under the age of six" [American Academy of Pediatric Dentistry, 2008]. The multifactorial nature of this disease involves a complex interaction between biological, social, and economic factors [Williams et al., 2002; Borssen and Stecksen-Blicks, 1998]. Three main elements, substrate, bacteria, and host, come into play in ECC [Keyes, 1969]. The presence of these three elements is necessary to initiate the carious process, and thus if one element was interrupted, the whole process will be prevented [Keyes, 1969]. Moreover, these factors are influenced by the interplay of multiple sociological and environmental factors [Uribe, 2009; Leong et al., 2013]. The sociological factors investigated in previous studies include parental education level and family income [Schroth et al., 2013; Ashkanani and Al-Sane, 2013]. Lower parental education and annual household income has been associated with higher prevalence of early childhood caries (ECC) [Gibson and Williams, 1999; Tickle et al., 1999]. The environmental factors, on the other hand, involve inappropriate feeding practices in very young children and oral hygiene status [Schroth et al., 2005; Schroth et al., 2013]. A significant association is observed between ECC and night time baby bottle feeding [Bissar et al., 2014].

Parents are the role models for their children. Children's tendency to imitate their parents is crucial in building their social skills. It is therefore expected that maternal knowledge and attitudes may provide an indirect insight to their children's health [Abiola Adeniyi et al., 2009]. Caregiver's oral health-related knowledge positively affects their practices and subsequently their children's oral health [Ashkanani and Al-Sane, 2013]. Also, the more positive is the parent's attitudes toward oral health, the better the children dental health will be [Skaret et al., 2008]. Certain caregiver's demographic factors, including education, age, and sex, may provide insight for improving their health habits and therefore their children's health [Ashkanani and Al-Sane, 2013]. In a previous report done in Kuwait, younger parents with a university degree or higher had significantly better oral health related knowledge than

less educated older participants [Ashkanani and Al-Sane, 2013]. Also, mothers showed a higher dental health related knowledge than fathers [Ashkanani and Al-Sane, 2013].

Despite the important role of the parents in the well-being of their young children, studies concerning parental knowledge, attitudes, and preventive behaviuors regarding their children's oral health are still scanty [Shivaprakash et al., 2009; Rwakatema and Ng'ang'a, 2009]. This fact hold true to Kuwait, where only one published research has been found by Ashkanani and Al-Sane [2013]. Developing a successful oral health promotion strategy in any community depends on an in-depth understanding of the distinctive needs of its population. This necessitates the need for further researches in the same area.

The objectives of this cross sectional study is to assess the overall mean knowledge and practice scores in this study sample. Also, independent variables such as, gender, area of resident, nationality, and age will be investigated to assess their influence on oral health related knowledge and practices of the caregivers.

Materials and methods

The study was approved by the Kuwait Health Science Center Ethical Committee. It was carried out between October and December 2013. A self-administered questionnaire was designed to assess the oral health related knowledge and practices among parents in Kuwait. The 17-item questionnaire in Arabic and English languages covered sociodemographic characteristics, oral hygiene habits, diet and feeding pattern, oral health and disease related knowledge and practices. Caregiver's general knowledge and practices were assessed based on answers to 9 and 4 questions respectively about their children's oral health. The knowledge sample size was calculated based on a mean knowledge score of 4.68 ±1.87 [Ashkanani and Al-Sane, 2013], expected difference of 0.5, an effect size of 0.2, α level of .05, and power of 90%, leading to a minimum knowledge sample size of 171 parents. For calculating practice sample size, a mean practice score of 2.45 ±0.99 [Ashkanani and Al-Sane, 2013], expected difference of 0.25, an effect size of 0.25, α level of .05, and power of 90% were assumed, and the calculated practice sample size was 167. Based on the above calculated sample sizes for both knowledge and practice, a sample size of 171 was chosen. A further 20% was added to compensate for a possible drop out, giving a total sample size of 205 parents. A decrease in both knowledge and practice scores were expected in this study since elderly parents were invited to participate in this study, in contrast to Ashkanani and Al-Sane [2013] study in which only caregivers for preschool children were included. Younger age was associated with better knowledge and practice scores [Ashkanani and Al-Sane, 2013; Nagarajappa et al., 2013]. A pilot study was carried out to test the comprehension of the questionnaire. The parents in the pilot study (n=15) were not included in the main sample. There were no misunderstandings regarding the questionnaire. Therefore, no changes had to be made to the data collection method. Subjects in this cross-sectional study were recruited randomly from five dental specialty centers, Al-Amiri, Bneid Al-Gar, Al-Adan, Al-Jahra, and Al-Farwaniya, in Kuwait. Kuwait is located in Middle East, and its total population is roughly 3.5 million, 33% Kuwaitis and the rest are non-nationals. The country is divided into 6 different governorates, Capital, Hawalli, Farwaniya, Jahra, Ahmadi, and Mubarak Al-Kabeer. According to the geographic location, patients from each governorate are assigned to the nearest dental specialty center. Each center covers dental needs of one governorate, Capital governorate is covered by Bneid Al-Gar Dental Specialty Center, Hawalli governorate by Al-Amiri Dental Specialty Center, Farwaniya governorate by Al-Farwaniya Dental Specialty Center, Al-jahra governorate by Al-Jahra Dental Specialty Center, with one exception, Al-Adan Dental Specialty Center, which receives patients from both Mubarak Al-Kabeer and Ahmadi governorates. A letter was sent to the head of each dental specialty center explaining the aim of the study and data collection methods after approval of Ministry of Health office of undersecretary of Kuwait. In every center, the dentists and administrators were informed about the study by the head of each dental specialty center, and a consent form, attached to each questionnaire explaining the aim, characteristics, and the importance of the study, was obtained from each subject. Parent's participation in the study was voluntary, free of pressure or constraint and in a fully informed manner. Inclusion criteria were: 18 years or older parents, competent in either Arabic or English language, signed informed consent. Three hundred self-administered questionnaires were distributed among literate parents visiting the five dental specialty centers of Kuwait. Al-Amiri, Bneid Al-Gar, Al-Jahra, and Al-Farwaniya centers received 50 questionnaires each, while 100 questionnaires were distributed in Al-Adan Dental Specialty Center, which represented patients from both Ahmadi and Mubarak Al-Kabeer governorates. One researcher distributed the questionnaire and was always present during completion of the questionnaire. Therefore, participants were able to approach the researcher for any possible clarification needed. Participants were instructed to respond to each question with one answer only. A correct answer earned one point, while no points were awarded for uncertain or wrong answers. Non completed questionnaires and those which were collected from non parent participants were excluded from the study, because assessing their oral health knowledge and practices is out the scope of this study.

SPSS version 21.0 was used for data analysis, and the level of significance used in this study was chosen at $p \leq 0.05$. Data were descriptively analysed, and the overall mean knowledge and practice scores were calculated. A chi-square test was used to determine whether each individual question varied across different socio-demographic characteristics. Socio-demographic characteristics included gender, area of residence, nationality, and age. The age of the participants were divided into 5 different groups ranging from 20-30 years, 31-40 years, 41-50 years, 51-60 years, and 60 and above for statistical purposes.

Results

Sociodemographic characteristics

A total of 236 questionnaires were collected from parents visiting 5 dental specialty centers in Kuwait, thereby giving a response rate of 87%. The background characteristics

of the responders are shown in Table 1. Nearly, an equal sex split was found, yet the study sample was diverse in terms of area of residence, nationality, and age. Based on answers given by the participants, most of the subjects resided in Ahmadi governorate (23.3%), while only 11.4% resided in Mubarak Al-Kabeer governorate. Majority of the participants (69.9%) were Kuwaitis, while non-Kuwaitis accounted for 30.1% of the study sample. Most of the parents were in between the age group 31-40 years (39.4%) and least in age group 60 years and above (2.1%).

Oral hygiene habits

Less than half of the parents (40.7%) stated brushing their children's teeth twice daily, while 38.1% of the participants reported once daily tooth brushing habit. The study participants brushed their children's teeth at different times during the day. Yet, 42.8% of the children got their teeth brushed in the morning and before going to bed. Only 11% of the subjects will wait a period of half to 1 hour before brushing their children teeth after a cariogenic meal. On the other hand, 55.9% of the subjects will brush their children teeth immediately after having a cariogenic meal (Table 2a). Table 3 demonstrates the association of different sociodemographic characteristics of the parents with oral hygiene habit dependent variables. A significant higher knowledge detected regarding the recommended frequency of daily tooth brushing habit in the age group 41-50 years (P = 0.034). However, no significant associations were found between the knowledge of the recommended frequency of daily tooth brushing habit with the parent's gender, area of residence, or nationality. No significant differences were detected between the knowledge of the recommended timing of daily tooth brushing habit nor the timing of brushing after a cariogenic meal with the parent's different sociodemographic characteristics.

Diet and feeding patterns

Knowledge

Only 14.4% of the caregivers in this survey provided their children with sugary attacks immediately after each meal. While, majority of the participants (79.2%) served their children with cariogenic snacks between meals. Most of the parents (61.4%) were aware that prolonged and frequent bottle feeding affects dental health. Yet, about one third of the study subjects (31.8%) were unaware regarding this fact. Around one third of the participants (28.8%) agreed to the fact that bacteria involved in dental caries could be transmitted through saliva. While, 42.4% were unaware regarding bacterial transmission (Table 2b).

Practices

Around 40% of the parents provide their children with plain water if they insist on having their baby bottle at bed time. Yet, nearly half of the parents (48.7%) provide their children with milk. Around 60% of the parents either taste or blow on food before introducing it to the child. However, almost 40% of the caregivers did not practice

Characteristic	n	%
Gender Male	106	44.9
Female	130	55.1
Area Capital	37	15.7
Hawalli	28	11.9
Ahmadi	55	23.3
Farwaniya	47	19.9
Jahra	42	17.8
Mubarak A-K	27	11.4
Nation Kuwaiti	165	69.9
Non-Kuwaiti	71	30.1
Age 20-30	40	16.9
31-40	93	39.4
41-50	61	25.8
51-60	37	15.7
>=60	5	2.1

TABLE 1 Parent's sociodemographic characteristics (n = 236).

ORAL HYGIENE HABITS	KNOWLEDGE	
	Frequency of daily tooth brushing	
	Once daily	38.1%
	Twice daily (correct answer)	40.7%
	More than twice daily	11.0%
	Not daily	7.6%
	Never	2.5%
	Timing of daily tooth brushing	
	Morning only	22%
	Morning and before bed only (correct answer)	42.8%
	Before bed only	20.8%
	After every meal	7.6%
	Never	6.8%
	Timing of brushing after a cariogenic meal	
	Wait for 5 min and then brush his/her teeth	27.5%
	immediately after eating	55.9%
	Wait for half to1 hour and then brush his/her teeth (correct answer)	11.0%
	My child does not brush his/her teeth	5.5%
DIET AND FEEDING PATTERNS	KNOWLEDGE	
	Timing of sugar attack	
	Morning	2.1%
	Between meals	79.2%
	Immediately after each meal (correct answer)	14.4%
	Before going to bed	4.2%
	Negative effect of prolonged and frequent bottle feeding	
	Yes (correct answer)	61.4%
	No	6.8%
	Don't know	31.8%
	Bacterial transmission	
	Yes (correct answer)	28.8%
	No	10.2%
	Maybe, if the parent is sick	18.6%
	Don't know	42.4%
	PRACTICES	
	Baby insists on baby bottle at bed time, you will provide him/her with	
	Milk containing sugar	48.7%
	Juice	10.6%
	Plain water (correct answer)	38.6%
	Water containing sugar	2.1%
	Introduction of hot food for first time	
	Taste food first to check the heat and then feed the child	39.8%
	Blow on food to cool and then feed the child	18.2%
	Feed hot food immediately for the child	4.7%
	Wait until food gets cooler and then feed the child (correct answer)	37.3%

TABLE 2 A - 2B Dependent variables.

ORAL HEALTH AND DISEASE RELATED KNOWLEDGE AND PRACTICES	KNOWLEDGE	
	Meaning of bleeding gum	
	Healthy gum	1.3%
	Inflamed gum (correct answer)	74.6%
	Allergic reaction to food	3.4%
	Don't know	20.8%
	Cause of bleeding gum	
	Hot drinks	3.8%
	Spicy food	11.0%
	Frequent use of tooth brush	8.1%
	Poor oral hygiene – bacterial disease (correct answer)	77.1%
	Time of first dental visit	
	6 months or when the first primary tooth erupts and no later than 12 months (correct answer)	11.4%
	2 years or when all primary teeth have erupted	21.2%
	6 years or when the first permanent tooth has erupted	24.2%
	12 years or when all permanent teeth has erupted	3.8%
	When there is some problem with the child's teeth (toothache)	39.4%
	PRACTICES	
	protect against bleeding gum	
	Brushing +flossing (correct answer)	37.7%
	Give vitamin C	9.2%
	Avoid spicy food	10.5%
	Fewer brushing frequency	7.6%
	Don't know	34.7%
	Parental role in children oral hygiene	
	I watch and direct my child (correct answer)	61.9%
	I only advise my child on the importance of tooth brushing	31.8%
	I never care	2.1%
	I leave this to other people	4.2%

TABLE 2C Dependent variables.

similar behaviours (Table 2b). Table 4 demonstrates the association of different sociodemographic characteristics of the parents with diet and feeding pattern dependent variables. A significant higher knowledge detected regarding bacterial transmission in female participants (P = 0.031) and Capital residents (P = 0.000). While, no significant associations were found between the knowledge of bacterial transmission with the parent's nationality or age. There were no significant differences detected between the knowledge of the recommended timing of daily sugary attacks nor the negative effect of prolonged and frequent bottle feeding on dental health with the parent's different sociodemographic characteristics. A significant better practice was observed in Capital residents with regard to the introduction of hot food to the child (P = 0.000). However, no significant better practice differences were found between the introduction of hot food to the child with the parent's gender, nationality, and age. Also, no significant better practice differences were observed with regard to the use of baby bottle at bed time with the parent's different socio-demographic characteristics.

Oral health and disease related knowledge and practices

Knowledge

About 75% of the study subjects identified the meaning

	Brushing after each meal (half to 1 hour) %	Timing of daily tooth brushing (Morning and before bed) %	Frequency of daily tooth brushing (Twice daily)%	Socio-demographic characteristics
Gender	Male	18.6%	18.2%	5.5%
	Female	22.0%	24.5%	5.5%
	value	0.175	0.369	0.228
Area	Capital	6.8%	8.5%	0.4%
	Hawalli	6.3%	7.2%	1.7%
	Ahmadi	11.4%	11%	4.2%
	Farwaniya	6.3%	5.9%	2.5%
	Jahra	5.9%	6.4%	0.4%
	Mubarak AK	3.8%	3.8%	1.7%
	P value	0.242	0.240	0.116
Nation	Kuwaiti	31.0%	31.8%	8.5%
	Non-Kuwaiti	9.7%	11.0%	2.5%
	P value	0.402	0.106	0.727
Age	20-30	4.7%	5.1%	2.5%
	31-40	12.7%	13.6%	4.2%
	41-50	14.0%	14.0%	3.0%
	51-60	8.5%	8.5%	0.85%
	>=60	0.85%	1.7%	0.4%
	P value	0.034	0.534	0.635

TABLE 3 Socio-demographic characteristics of the parents and oral hygiene habit dependent variables.

and cause of gum bleeding. The awareness that the first dental visit should be no later than 12 months of age was present in only 11.4% of the caregivers. However, majority of the participants (39.4%) will schedule their children's first dental visit only if the child complains of toothache (Table 2c).

Practices

Around one third of the study population (37.7%) knew that brushing and flossing help to prevent gingivitis, while the rest of the participants either did not know or reported wrong answers. Parental role in daily oral care was reported to be mainly related to watch and direct the child (61.9%). On the other hand, about one third of the parents (31.8%) only give advices on the importance of tooth brushing (Table 2c). Table 5 demonstrates the association of different socio-demographic characteristics of the parents with oral health and disease dependent variables. A significant higher knowledge detected regarding the meaning of bleeding gum in Capital residents (P = 0.001). While, no significant associations were found between the knowledge of the meaning of bleeding gum with the parent's gender, nationality, or age. Also, a significant better knowledge was detected among female participants (P = 0.001) in relation to the aetiology of gum bleeding. There were no significant differences observed between the knowledge of the aetiology of bleeding gum with the parent's area of residence, nationality, and age. No significant better practice differences were observed with regard to the use of tooth brush and floss in the protection against bleeding gum nor the parental role in their children's daily oral care with the parent's different

TABLE 4 Socio-demographic characteristics of the parents and diet and feeding pattern dependent variables.

	KNOWLEDGE			PRACTICES	
	Timing of sugar attack (Immediately after each meal) %	Negative effect of prolonged and frequent bottle feeding %	Bacterial transmission (Yes) %	Baby insists on baby bottle at bed time (Plain water) %	Introduction of hot food for 1st time (Wait until food gets cooler) %
Gender Male	5.9%	25.0%	11.4%	15.2%	15.2%
Female	8.4%	36.4%	17.3%	23.3%	22.0%
value	0.689	0.077	0.031	0.317	0.862
Area Capital	2.9%	1.2%	6.8%	6.3%	8.0%
Hawalli	1.6%	5.5%	2.9%	4.6%	3.3%
Ahmadi	2.9%	1.4%	5.9%	11.4%	6.7%
Farwaniya	1.6%	1.3%	4.2%	8.5%	7.0%
Jahra	3.3%	1.0%	5.5%	5.0%	6.7%
Mubarak A-K	1.6%	6.7%	3.4%	2.5%	4.2%
P value	0.282	0.205	0.000	0.071	0.000
Nation Kuwaiti	9.3%	45.7%	21.2%	26.2%	2.5%
Non-Kuwaiti	5.0%	17.0%	7.6%	12.3%	1.4%
P value	0.090	0.080	0.090	0.497	0.112
Age 20-30	2.5%	9.3%	4.6%	5.9%	6.7%
31-40	6.3%	22.8%	11.86%	15.2%	15.2%
41-50	3.4%	16.1%	7.2%	10.5%	8.0%
51-60	2.1%	11.4%	4.2%	5.9%	5.9%
>=60	0.0%	1.6%	.84%	.84%	1.2%
P value	0.913	0.546	0.905	0.923	0.813

sociodemographic characteristics.

Overall mean knowledge and practice scores

The overall mean knowledge score was 3.61 ±1.64 (range, 0-9), while the overall mean practice score was 1.57 ± 0.90 (range, 0-4).

Discussion

Maternal knowledge and attitudes are correlated to their children's health [Abiola Adeniyi et al., 2009]. Caregiver's oral health related knowledge positively affects their children's oral health [Ashkanani and Al-Sane, 2013]. Parents of caries-free children have more positive attitudes when compared with those with caries [Skaret et al., 2008]. Therefore, the assessment of parental oral health related knowledge and practices is crucial to highlight potential deficient areas, since developing a successful oral health promotion strategy in any community depends on understanding its distinctive needs.

Oral hygiene habits

Tooth brushing is an inexpensive, effective, and easy plaque control method [Ashley, 2001]. The American Academy of Pediatric Dentistry [2008] current recommendation includes twice daily tooth brushing habit, at bedtime and at one other time during the day. In this study, less than half (40.7%) of the parents stated brushing their children teeth twice daily. This is consistent with the findings from previous studies [Rajab et al., 2002; Chhabra and Chhabra, 2012] who found that most of parents were unaware of the recommended frequency of daily tooth brushing habit. While, higher percentages were observed in earlier surveys of preschool children in Kuwait and Ireland [Ashkanani and Al-Sane, 2013; ElKarmi et al., 2015]. Reasons for this difference in the reported percentages might be explained by the fact that the earlier surveys adopted different screening procedures, inclusion criteria, and age groups under investigation. Additionally, only 42.8% of the children got their teeth brushed in the morning and at bedtime. Data from previous studies showed that erosive tooth wear increases if tooth brushing takes place immediately after consuming erosive food or beverage [Shellis and Addy, 2014; Lussi et al., 2004]. Therefore, it has been suggested that tooth brushing should be delayed for 30 min to 1 hr after food consumption [Ganss et al., 2007]. However, majority of parents (55.9%) in this study will brush their children's teeth immediately after a cariogenic attack.

Diet and feeding patterns

The American Academy of Pediatric Dentistry [2008] has recommended that the consumption of cariogenic food and beverages should be limited to the meal times to reduce the risk of dental caries. Nearly 80% of the participants in this study fed their children with cariogenic snacks between meals. Similar findings were reported by ElKarmi et al. [2015], while a lower percentage was observed in a previous study by Ashkanani and Al-Sane [2013]. Contrary to Chhabra and Chhabra [2012], Nagarajappa et

TABLE 5 Socio-demographic characteristics of the parents and oral health and disease dependent variables.

	KNOWLEDGE			PRACTICES	
	Timing of sugar attack (Immediately after each meal) %	Negative effect of prolonged and frequent bottle feeding %	Bacterial transmission (Yes) %	Baby insists on baby bottle at bed time (Plain water) %	Introduction of hot food for the first time (Wait until gets cooler) %
Gender Male	31.0%	32.2%	5.9%	17.0%	28.4%
Female	43.6%	45.0%	5.5%	20.7%	33.5%
value	0.315	0.001	0.780	0.995	0.090
Area Capital	17.7%	12.7%	2.1%	8.8%	11.4%
Hawalli	10.2%	10.1%	2.1%	4.2 %	6.3%
Ahmadi	14.0%	16.9%	2.5%	8.0%	14.4%
Farwaniya	15.2%	15.2%	3.3%	5.0%	11.9%
Jahra	8.8%	11.0%	0%	6.3%	11.4%
Mubarak A-K	8.4%	7.2%	0 .84%	5.0%	6.4%
P value	0.282	0.205	0.000	0.071	0.000
Nation Kuwaiti	53.4%	54.7%	6.8%	27.1%	42.8%
Non-Kuwaiti	21.2%	22.5%	4.7%	10.6%	19.1%
P value	0.817	0.442	0.743	0.604	0.841
Age 20-30	13.1%	13.5%	1.6%	5.0%	14.0%
31-40	28.4%	30.0%	6.3%	15.6%	27 .0%
41-50	20.7%	19.0%	2.1%	11.0%	15.0%
51-60	11.4%	13.1%	1.3%	5.5%	8.5%
>=60	0 .84%	1.3%	0%	0.42%	1.7%
P value	0.383	0.746	0.566	0.841	0.429

al. [2013], and Al-Zahrani et al. [2014] findings, majority of participants (61.4%) in this study sample were aware of the negative effect of prolonged and frequent bottle feeding on dental health. Despite the earlier finding, the study participants seem to lack the motivation needed to improve their practices in night time bottle feeding. Only 38.6% of the participants provide their children with plain water if they insist on having their baby bottle at bedtime. Similar poor practices were also observed in a previous report among Indian caregivers [Nagaraj and Pareek, 2012]. The vertical transmission of cariogenic bacteria from mother to child through saliva contact is well-documented [Douglass et al., 2008]. However, it was surprising to find that only 28.8% of caregivers knew about the transmission of cariogenic bacteria. The findings were similar to that reported by Chhabra and Chhabra [2012] and Nagarajappa et al. [2013]. Furthermore, 60% of caregivers practiced tasting or blowing on food before giving it to the child. Such practices were also predominant among caregivers residing in Australia [Gussy et al., 2008]. Yet, majority of parents in Udaipur did not practice similar habits [Nagarajappa et al., 2013]. Again, this difference can be attributed to different sample selection and method of screening.

Oral health and disease related knowledge and practices

It was encouraging to find that majority of caregivers identified the meaning and etiology of gingival bleeding. The findings of present study were in agreement with another work by Eigbobo and Onyeaso [2013], in which participants were aware of the role of bacteria in gingivitis. Furthermore, most parents in this study failed to recognise the role of tooth brushing in the prevention of gingivitis. In agreement with other studies [Nagaraj and Pareek, 2012; Al-Zahrani et al., 2014; Ashkanani and Al-Sane, 2013], lack of infant oral health-related knowledge, timing of first dental visit, was also evident in this study. This is possibly due to the fact that, in Kuwait, infant oral health-related promotion and prevention programmes rarely take place. It was satisfying to find that majority of participants (61.9%) were actively involved in their children oral hygiene. The results coincided with a previous survey of preschool children in Kuwait [Ashkanani and Al-Sane, 2013]. On the contrary, a negative parental role in children's oral hygiene was reported in previous studies by Chhabra and Chhabra [2012], and Rajab et al. [2002].

Socio-demographic characteristics associated with better knowledge and practices in the studied sample / Oral hyiene habits

A significant higher knowledge detected with regard to the recommended frequency of daily tooth brushing habit among older participants in the age group 41-50 years (P = 0.034). This can be related to the fact that older participants were most probably not first time parents and had already taken care of older children.

Diet and feeding patterns / Oral health and disease related knowledge and practices

A significant better knowledge detected among female subjects in areas like bacterial transmission (P = 0.031) and

aetiology of gingivitis (P = 0.001), a finding that can be due to the fact that mothers are more involved in day-to-day care of their children compared to fathers.

In addition, caregivers residing in Capital governorate showed a significant better knowledge in bacterial transmission (P = 0.000), meaning of bleeding gum (P = 0.001) and better practice with regard to the introduction of hot food to the child for the first time (P = 0.000). Such findings were expected since Kuwait School Oral Health Program was first implemented in Capital governorate. Such program aims at increasing the parental awareness regarding oral health preventive measures through organizing oral health education sessions and participating in community activities in public places.

Discussion

Limitations

This cross-sectional study is not free from limitations; it was conducted on a small convenience sample, which limits the generalisability of our findings to the entire Kuwaiti population. Finally, participants in this study were recruited from the five dental specialty centers of Kuwait and thus may have received information regarding oral health preventive measures from their dentists. If so, the study findings may overestimate the parental knowledge regarding their children's oral health.

Recommendations

The study results identified many areas of uncertainty and lack of knowledge of children oral health among parents in Kuwait. Thus, multidisciplinary approaches to improve children's oral health are needed. Oral health education programmes that aim to improve oral health practices among parents should be implemented early in life. Therefore, coordinated efforts by paediatricians, paediatric dentists, and other health care professionals are required. Training health care professionals, in contact with expectant mothers as well as mothers of infants, to perform infant oral health examinations is crucial to evaluate the patient's risk of developing oral diseases and optimise fluoride exposure. Also, information regarding infant oral health can be provided. For school-age children, preventive programmes in schools are required to increase parent's awareness regarding oral hygiene habits, diet and feeding practices, and to promote early preventive visits to the dentists.

Conclusion

Parents in Kuwait seemed to have weak knowledge and practices with regard to their children oral health. Many areas of uncertainty and lack of knowledge of children oral health have been identified. Most participants failed to recognise the recommended frequency and time of daily tooth brushing. Weak parental knowledge and practices, with regard to diet and feeding patterns and infant oral health, were also evident. However, participants had good knowledge, regarding the meaning and etiology of bleeding gum, and positive role in their children's daily oral hygiene. Therefore, efforts should be organised to address oral health-related issues in future oral health promotion programmes.

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