Mothers' understanding of dental-caries related feeding practices and children's use of dental care in Ajman

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Aim and objectives: To investigate mothers' understanding of dental-caries-related feeding practices and children's use of dental care in Ajman. **Design:** Six focus groups were selected, each comprising 5-10 mothers from urban or rural areas and different nationalities. Questions were formulated using information obtained from a previous questionnaire survey using a funnel approach. The information from transcripts was analysed using standard qualitative manual thematic coding. **Results:** 42 mothers participated. While eager to improve children's oral health, the mothers held slightly unfavourable attitudes towards the diet of their young children, suspecting that their children's diet could be improved in order to be 'healthier', but also citing pressing social and cultural constraints which made that difficult to achieve. However, at the same time as wishing for a healthier diet, certain beliefs about oral health existed among the mothers, which worked against what a dental professional would consider to be desirable nutritional guidelines and oral health behaviours. The use of dental services was hampered by barriers such as cost, long waiting time and anxiety. Primary teeth were not highly valued by poorer mothers. **Conclusion:** The mothers' knowledge of dental caries and the cariogenic effects of some foods were at odds with contemporary understanding. There appears to be an urgent need for oral health programmes targeted at the treatment and underlying causes of dental caries.

Key words: Caries, diet, qualitative study, UAE

INTRODUCTION

The Emirate of Ajman is part of a larger collection of Emirates known collectively as the United Arab Emirates (UAE). The Emirate of Ajman is situated on the coast of the Arabian Gulf, extending over a distance of 16 km (259 square km) between the Emirates of Umm Al-Qiwain and Sharjah. The most recent population estimate was 189,000 (Ministry of Health, 2001). Ajman has been transformed into an Emirate with modern facilities and amenities, and is well connected with the rest of the UAE by modern highway and road networks. However, the traditional way of life has been largely preserved, forming with the modern living environment, a pleasant blend of the old and the new and the simple and the sophisticated. The economy of the Emirate has been self-supporting, being driven by the three sectors of commerce, construction and industry. Although only a few studies have documented the oral health of young children in the United Arab Emirates (Al-Mughery *et al*., 1991; Al-Hossani and Rugg-Gunn, 1998; Hashim *et al*., 2006), there is increasing recognition that early childhood caries is a significant problem in the area. Dental caries experience in young children in the Emirate of Ajman is high; a recent study reported a mean 4.9 dmft at the age of 5 years (Hashim *et al*., 2006), most of which comprised untreated decay, and only 25% of the population was caries-free. During that study, parents completed a questionnaire on their children's dietary habits and use of dental care. Strong associations between caries experience and poor dietary habits and symptom-driven use of dentistry were observed. Snacking three or more times per day was associated with a dmft score that was almost one-third higher than that for children who snacked only once daily. One-third of children had a low overall snack consumption (41% moderate and 25% high). There was a consistent dmft gradient across those categories. Most children were not routine users of dental care (Hashim *et al*., 2009).

Cross-sectional studies do not provide much insight into the mechanisms behind such associations; however, qualitative research has the potential to enhance understanding of how they come about. Qualitative studies have proved to be a useful source of information for understanding and interpreting quantitative research findings (Stewart and Shamdasani, 1990; Pope and Mays, 1995). While still a fledgling area of study, focus group methodology is starting to be used in dental research, with a small but a diverse range of topics being investigated (Riedy *et al*., 2001; Fitzgerald *et al*., 2003; Kelly *et al*., 2005; Gussy *et al*., 2006; Hilton *et al*., 2007; Hed-

man *et al*., 2009; Le *et al*., 2009; Mofidi *et al*., 2009; Huebner and Riedy, 2010).

Although the literature reveals considerable use of focus groups with English-speaking samples in developed countries, there is little on their use in non-English-speaking communities or in developing countries. Only a few focus group studies have been carried out to understand Arab health issues (Kulwick, 1996; Borkan *et al*., 2000; Bener *et al*., 2002), and none of that research has examined child oral health. The poor oral health observed in Arab countries not only demands research into its determinants, but that also work must include the full repertoire of research approaches and methods in order to fully understand the mechanisms involved and how best to improve the situation.

The aim of the current study was to collect additional information on the dietary habits of (and dental service utilisation by) young children in Ajman. Determining the mothers' knowledge of and attitudes to dental caries prevention was a fundamental element of this information acquisition, because any preventive strategy recommendations arising from this study would have to be compatible with the study participants' knowledge and attitudes.

MATERIAL AND METHODS

The qualitative study approach was used, and the study was officially approved by both the UAE Ministry of Health and the Ethics Committee of the University of Otago. Permission was sought from the participants, and written consent was obtained from those who agreed to be included in the study.

Convenience sampling was used because representativeness of the population was not a prime consideration, as the emphasis of the research was on understanding particular features of the population, rather than making inferences about it as a whole (Mays and Pope, 1995). The sampling aimed to obtain a diverse group of mothers of 5-year-old children from different nationalities and educational backgrounds in the Ajman area. Six groups were selected, each containing 5-10 participants from urban and rural areas of Ajman, aged between 30 and 40 years, with the data collected from November 2003 up until May 2004. Mothers were targeted for this study because it is typically the maternal parent in Arab society who assumes responsibility for young children. Moreover, mixed-gender groups would be unproductive in conservative Islamic cultures, both in terms of the gender mix of the participants in the groups and in relation to the gender of the researcher and the participants.

The six groups selected for the study included participants from five different nationalities; two groups were Emirati, while the others were of Palestinian, Yemeni, Sudanese and Egyptian origin. These groups constitute the most common Arab nationalities living in the UAE. The selected population groups were further categorised by their education level: those who had completed secondary school, college, or university were categorised as highly educated, while those who had completed only primary school or lower represented the less formally educated mothers. This particular classification draws on the researchers' background knowledge of education levels and demographic stratification in the UAE. It has also been effectively used for similar oral health studies in the UAE and neighboring countries (Al-Hossani and Rugg-Gunn, 1998; Al-Malik *et al*., 2001). Three higher-educated groups and three less-educated groups were identified and selected in order to get a broad indication of the mothers' differing attitudes and beliefs, and how these attitudes related to educational attainment level (Mattila *et al*., 2000; Steadman and Rutter, 2004). The number of mothers invited to take part and the number who actually participated in the study is shown in *Table 1* according to their nationality and educational level.

Primary schools in Ajman and the paediatric clinic of the Dental Faculty were the main sites of recruitment. The moderator (with the help of the note-taker) contacted all mothers by telephone or in person. The general topics of interest and the importance of the mother's participation and opinions were carefully explained. Mothers were asked about their nationality and level of educational achievement prior to being invited to participate. All were informed about the practicalities of focus group research and the tape-recording of sessions. Efforts were made to select participants who had easy access to the location of the focus group sessions and 25% over-recruitment was implemented in order to ensure a sufficient number of participants while allowing for non-attendance (Powell and Single, 1996; Morgan, 1997). No participant was included in more than one group (Newsome and Wright, 2000; Leask *et al*., 2001).

Child dental health problems had previously been identified in the earlier oral health survey stage (Hashim *et al*., 2006); characteristics and behaviours found to be associated with dental caries experience among the pre-school children were used as topics of discussion and organised according to the outcome of that preliminary analysis. Questions of greatest importance were placed at the beginning of the guide, while those of lesser significance were placed near the end. This allowed a greater opportunity for exploring the most important topics under discussion. The outcome of this process constituted the interview guide. The less structured questions preceded those with more structure, because those with more structure would have tended to establish direction for responses and resulted in a narrowing of the discussion. Efforts were made to cover all topics under investigation, and leading questions were avoided by a careful review of question areas. Questions were phrased in simple language that respondents could understand and which did not place them in embarrassing or defensive situations.

The main researcher (a female Arab dentist aged in her mid-thirties, with qualifications and experience in preventive dentistry and health promotion) played the role of moderator. Another female (a preventive dentistry specialist) was chosen as assistant moderator or note-taker. As previously noted, cultural restrictions precluded the presence of males in the sessions. Other personal characteristics (such as age and language) were also considered in the recruitment of moderators; the ages of both moderator and note-taker were close to those of participants (30-40 years), and all spoke the

same language (Arabic). Being a female Arab, the moderator was also able to understand and enter deeply into the cultural world of the participants.

The decision was made for all focus groups to be conducted by both the moderator and the note-taker, and for written notes to be taken by the note-taker rather than by the moderator. The note-taker did not participate directly in the activities or conversation of the group, and focused instead on recording responses. Similarly, all sessions were conducted by the same moderator, because it is desirable for all groups to have the same moderator (Dahlin Ivanoff *et al*., 1996) who can play an active role in guiding the discussion and stimulating each participant to talk freely.

A small focus group discussion consisting of six participants was arranged for the pre-testing of discussion topics. This provided the researchers with an important opportunity to determine whether the wording of questions was appropriate, and whether the questions elicited sufficient discussion (Stewart and Shamdasani, 1990). Lessons learned from this pre-testing session included ensuring proper seating arrangements to maximise interaction between participants, and preparing appropriate tape-recording facilities that maximised the quality of the recorded data. Other points which were clarified during the pre-testing session included the most appropriate timing for probing reluctant participants, and suitable ways of encouraging them to share their views. No changes were made to the questions themselves, as they were judged to be adequate by the moderator and note-taker; this was supported by participant feedback which indicated that the wording of the questions was appropriate, unambiguous and relevant.

In all sessions, group participants were seated in a circular arrangement in a manner that provided maximum opportunity for eye contact for both moderator and participants. Refreshments (such as juice, coffee and dates) were provided in all sessions, as providing guests with food or drink is an important part of Arab hospitality. A trusting and friendly atmosphere was encouraged from the beginning of every session by a warm welcome from the moderator and the note-taker, followed by an explanation of the topics of interest. Participants were then asked to introduce themselves, and the group members introduced themselves very briefly. To ensure some protection of participant privacy, first names or nicknames only were used in these introductions.

The moderator began the session with topics related to the most important questions, followed by less important questions in the style outlined above. The moderator encouraged participant discussion by clarifying any uncertainties and interjected during the discussion when necessary to keep the flow of the session as smooth as possible. Care was taken not to guide the participants to any particular response; rather, honest responses were encouraged. During the discussions, all members of the groups were encouraged to participate; those who were reluctant were drawn into the discussion. Follow-up and probing questions were asked when necessary, in order to extract more information. Sessions lasted between 50 and70 minutes. The focus group discussions were held in the meeting room of the Dental Faculty or the meeting rooms of selected schools. The locations of the sessions were selected with participants' convenience in mind, and for being easily identifiable and accessible to the mothers. All sessions were held in the evening, as it was important to choose a time that did not interfere with the five daily prayers.

Initial analysis of the contents of the recorded sessions involved repeated careful listening to the tapes. While this approach was very repetitious, it also provided the researcher with a 'feel for the data' and a clear indication of the meaning of the participants' comments and explanations. The focus-group tapes were then transcribed to avoid the risk of selective and superficial analysis. The discussions on each tape were transcribed verbatim in Arabic. Each of the six transcripts was supplemented by the additional observational data that were obtained from recording the non-verbal communication during the sessions. As the focus group sessions were conducted in Arabic, all segments were subsequently translated into English with the help of a professional linguist in order to make the interpretations as accurate as possible. The translated transcripts were then back-translated into Arabic to further ensure the accuracy of translation. The researcher endeavoured to record the views, experiences and ideas of the participants as faithfully as possible, but, as with all qualitative research, it must be acknowledged that the researcher plays a fundamental role in the framing of the research data. While there is certainly potential for subjectivity and bias in qualitative research, the concept of validity that underlies these concerns is a contested one (Oakley, 2000). We contend that the further analysis provided by two experienced qualitative researchers (RPF and CTS) at the University of Otago enhanced the methodological rigour and validity of this research.

The 'manual thematic coding method' of analysis was used for this study (Morse and Richards, 2002; Green and Thorogood, 2004). This is the most common analytic technique for focus group data, as it is a reasonably fast and cost-efficient method. Colour-coded brackets were used to differentiate topics within the text. The amount of material coded for any one topic depended on the importance of that topic to the overall research questions. The colour-coded and numbered topics in each session were identified, cut, sorted, and arranged according to the interview guide, and assembled in categories to form an organised collection of information. This cutting and sorting process was carried out using a word processing program. Repeated responses were taken into consideration, as they constituted the shared ideas of the participants. Answers which did not relate specifically to the issues being examined were excluded after careful consideration. Interpretation of the findings was based on the meaning of the general data collected in the sessions (Krueger, 1987). In this study, the primary researcher processed the data by continually revising code categories, and creating memos to document code definitions as well as relationships between various codes. Constant comparisons were carried out within the data to detect divergent views

among the participants. A summary of the key higher and lower order coded categories is presented in *Table 2*. The oral-health-promoting behaviour of women in these focus groups can be understood as a dynamic set of practices which were buoyed by positive health-promoting forces such as mothers' wishes for good health, love of children and desire for better oral health for their children, but which were also more forcefully impacted upon (in a seesaw-like effect) by a variety of contradicting background cultural views. These included distinctive cultural perceptions of the role of dentists, views on childhood development and dentition, the meanings of food and styles of caregiving, and they had the cumulative effect of weighing down the focus group mothers' efforts to promote better oral health.

Table 1. The characteristics of mothers who contributed in the focus group sessions

Group	Nationality	Education level	Number of mothers: Who were invited	Who participated
1	Local (Emirati)	Higher	12	10
2	Palestinians	Lower	10	8
3	Yemenis	Lower	9	5
4	Sudanese	Lower	9	5
5	Egyptians	Higher	9	6
6	Local (Emirati)	Higher	10	8

Table 2. Summary of key conceptual categories obtained from thematic analysis of focus groups

NEGATIVE THEMES UNDERMINING ORAL HEALTH

Mothers' Views of Dental Professionals
- As providers of a technical service
- Painful
- Too busy to talk
- Too expensive in private practice (More relevant to Palestinian and Yemeni Focus Groups)

Cultural Views on Child Development and Biology
- Primary teeth = 'spare' teeth
- Secondary teeth more decay-resistant
- Practising oral health requires children to be capable of reason

Cultural Meanings of Food
- Nutritious food = calorie-dense food
- Sweet foods that are not sticky = nutritious food (i.e. coca cola)
- Frequent snacking is 'good' for children
- Giving snacks expresses love

Social Organising of Family Life (Relevant to Ajmani and Egyptian focus groups only)
- Nannies as primary care givers avoid promoting oral health

POSITIVE THEMES PROMOTING ORAL HEALTH BELIEFS

- Mothers' wish for good oral health outcomes for their children
- Mothers' love for their children
- Mothers' wish for better oral health knowledge

RESULTS

In keeping with the qualitative research approach, the following analysis is presented in a discursive format. Some direct quotes will be given as examples, in order to show the interaction between group participants and to illustrate the findings. The quotes were obtained from the transcript of each focus group after each translation.

In general, the mothers in these focus groups held slightly unfavourable attitudes towards the diet of their young children, suspecting that their children's diet could be improved in order to be 'healthier', but also citing pressing social and cultural constraints which made the amelioration of their children's diets difficult to achieve. However, at the same time as wishing for a healthier diet, certain beliefs about oral health existed among the mothers which worked against what might be considered to be desirable nutritional guidelines and oral health behaviours from a dental professional's perspective. Even so, all groups of mothers were favourably disposed to improving their children's oral health. These opinions held true across the majority of members of all of the focus groups, with the local Emirati mothers being the most vocal in their wish for better oral health. Given the very high motivation of mothers in all groups to improve their children's health and to care for them in the best manner possible, it may appear somewhat paradoxical, then, to consider the very high prevalence of dental caries among the young children examined in the earlier quantitative study (Hashim et al., 2006), many of whom were drawn from the same population pool as the mothers in this study. It is, however, through the study of these health beliefs that the reasons behind the surprisingly poor oral health of children (who are well cared for by attentive and loving mothers) can be explained.

An associated traditional belief surrounding teeth which reinforced this lack of attention to oral health practices was that primary teeth were a 'spare set of teeth'; this was a comment made by the majority of mothers in all of the focus groups. The awareness that a second set of teeth would eventually erupt and replace the primary teeth was a widespread panacea for any concerns over the state of the primary dentition. The second set of teeth (in contrast) was understood by all the mothers to be much stronger and more resistant to decay. For many mothers, the added advantage of considering only the quality of their children's second set of teeth was that they erupted at an age when children were more amenable to reason and thus more responsive to requests to brush their teeth and so on. The only symptom of dental disease which mothers recognised as serious (and thus chose to act upon in relation to these primary teeth) was pain. If that occurred, all mothers were concerned to relieve it immediately through the professional services of a dentist. In such a scenario, the dentist was understood to supply only a 'mechanical' service. This view of the dentist's role as primarily being that of a technician was widespread through all the groups; again, this is an important consideration in any subsequent preventive interventions. A public information campaign to improve children's oral health would also need to raise public awareness of the purpose of preventive dentistry.

Cultural understandings of the meaning of children's food

Mothers in all six focus groups held what is considered in the professional (that is, preventive dentistry) sense to be inappropriate and (at times) quite harmful understandings of the basic nutritional value of the food their children were consuming. For example, most mothers understood the meaning of 'nutritional food' to be calorie-dense foodstuffs. Using this line of thinking, it then appeared to be entirely appropriate for many of the participants to give sweets to their children between meals. They explained this by noting that they believed that young children spend long hours in playing, get hungry, and therefore need to recover their energy by eating sweets. Knowing that children must eat nutritious food, and given their understanding of sweets as calorie-dense and hence 'nutritious', the participants observed no dissonance between the encouragement of such behaviour and a wish for better oral health outcomes. Here are some typical responses on this topic; however, all mothers from all of the focus groups held these general opinions:

Sweets between meals give the child energy.
[Emirati mother – translated from Arabic]

All types of foods are good, and all have nutritional values; sugar should not be an exception, because it provides a lot of energy to the children.
[Emirati mother – translated from Arabic]

Children must eat nutritious meals, and sweets are nutritious types of food (background noise of all members in the group agreeing on this point).
[Emirati mother – translated from Arabic]

Although some mothers did not share the more dominant understanding in all the focus groups of sweets as 'good nutrition', those individuals tended to rank and categorise certain snacks in terms of their possible harm, using a criterion to differentiate between 'good' and 'bad' snack foods which was still incompatible with a preventive dentistry perspective. For example, such a ranking held that white chocolate was superior to brown chocolate as it had 'no sugar', and that Coca-Cola was similarly low in sugar because it was in a liquid form and did 'not stick on the teeth'. A differentiation was also made between cheap and expensive sweets, and the cheap sweets alone were thought to be bad for oral health (according to the Sudanese and Yemeni groups). The reason for this was their 'sticky' nature. This is a fascinating finding and starts to unravel the thinking which lies behind the apparent contradictions between the mothers' wish for good oral health for their children and a tendency to engage in behaviours that are widely demonstrated to be damaging to oral health. Stickiness seems to be a general indicator of a 'bad' food for oral health, and helps to explain what was initially a confusing finding from the focus groups with

respect to the manner in which mothers used contradictory meanings of 'sweet' (sometimes implying it was wholesome food and, at other times, implying that it was detrimental to oral health). The data from the Sudanese and Yemeni groups, however, suggest that what mothers are actually talking about in these discussions are two subcategories of meanings of the word 'sweet'. In one meaning, 'sweet' is understood to be referring to things which are sweet and non-sticky. These are understood to be 'good' foods when compared to the term 'sweet' in which the word signified both sweet and sticky, which was understood to be a 'bad' type of food. On further reflection on the meaning of these focus group discussions, it appears that these basic subcategories of sweetness are so pervasive that they assume that the unvoiced 'stickiness' or 'non-stickiness' aspect of the category of sweetness being discussed is well understood by the listener through the latter's knowledge of the food being described.

Verification of this local classificatory system would require full-scale qualitative research on the cultural significance of food in Emirati society which is obviously outside the scope of this study. One must consider, for example, the effect of translation on the meaning and significance of these words. However, at the very least, this is a fruitful area for further study. A particularly interesting factor to consider would be the significance (or otherwise) of the way in which 'sugar' is understood to be quite different to the 'sweetness' of food (that is, the example of Coca Cola being sweet but with 'no sugar').

Another area of potential explanatory interest in the cultural knowledge of food consumption lies in elucidating the social mores which govern mealtime and non-mealtime eating behaviour. Some mothers believed that children tend to eat a lot of snacks because they do not eat proper meals with their families. It was felt that children who usually ate their meals with their parents had more opportunity to clean their teeth after each meal, because they might follow their parents' behaviours.

Children do not usually finish their main meals, so they try to compensate by eating between meals.
[Palestinian mother – translated from Arabic]
I have to force my children to eat a proper meal with us, because if I don't do that they will keep eating snacks.
[Sudanese mother – translated from Arabic]

Children don't like to eat with their parents unless they are forced to do so, especially by the father, and when the father is not at home, children usually refuse to eat the homemade food.
[Emirati mother – translated from Arabic]

The cultural significance of allowing children to snack as a sign of indulgent and 'good' parenting presented dilemmas for modern mothers on how to manage their children's diet. For example, some mothers blamed themselves for keeping a lot of snacks available at home, thus indirectly encouraging their children in frequent eating of these, while other mothers felt that, by doing so, they were doing the right thing for their children.

If sweets are not available at home, the child's consumption will be less.
[Emirati mother – translated from Arabic]

If we do not keep chocolate and sweets in the kitchen cupboard our children's dental and oral health will be much better.
[Sudanese mother – translated from Arabic]

I don't encourage minimising sweets consumption for children because they have to satisfy their need and desire.
[Sudanese mother – translated from Arabic]

Care and love towards children is also customarily expressed through the giving of sweet food, such as in the following examples:

The only family time we spend with our children is the weekend, so we take them out and buy them lots of sweets; this is the way to show how much we love them.
[Sudanese mother– translated from Arabic]

Similarly, the act of providing such food for children then becomes a pleasure in itself. For example:

I usually love to buy chocolate and sweets for my children. I know it is not good for their teeth, thus, I hide it to minimize the amount they consume, and I give them a portion once a day only
[Egyptian mother – translated from Arabic]
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Maternal control over children's diets

The social organisation of Emirati life means that mothers in many families usually have at least one maid or nanny to assist them in looking after their children. Many mothers in such well-to-do families are professional women, and the nannies provide the day-to-day care of children while the mothers are at work. The Emirate mothers in these focus groups were no exception, and they commented freely on the difficulties of ensuring that children followed what the mothers understood to be sound oral health procedures (such as tooth brushing) while being cared for by a nanny. Several reasons were offered for less-than-optimal tooth brushing by children. For example, some mothers pointed out that the nannies themselves were not always well educated and so did not understand the significance of tooth brushing for oral health. Another frequently cited reason was the desire by the nanny to placate the children and avoid any confrontations which could impact negatively on how their employer viewed their ability to manage the children. Frequently, this meant allowing children to 'skip' brushing.

With regard to any alteration in child feeding, mothers said that there would probably be some differences, although not necessarily threatening dental health, depending on who fed the child. They thought that it was very difficult to control children's diets while they were away, because they usu-

ally left their children with their maid. As a result, they rarely knew what types of foods were given to their children.

The housemaid gives my children whatever they want to eat especially if I'm at work as they keep crying if she does not give them what they want.
[Emirati mother – translated from Arabic]

Housemaids usually obey the child's demands and do whatever they ask, so as to avoid trouble.
[Sudanese mother – translated from Arabic]

Housemaids do not pay any attention to what the children are eating.
[Egyptian mother – translated from Arabic]

It was apparent that the most frequently mentioned response was to do with the lack of control over children's diets. Some mothers said that groceries and large supermarkets were open during the day and until late at night, so that children could go with anyone to these shops and buy their favourite sweets. Therefore, they preferred to provide sweets for their children at home and give these whenever necessary.

Dental service use and child oral health

Before any improvements to the health care system can be seriously considered, it would be prudent to first obtain an adequate understanding of people's oral health behaviour and their attitudes to dental care. Extremely few mothers attended a dentist for regular check-ups for their children, and most attended only when a specific problem arose. The reasons given for the low attendance included long waiting times to see a dentist, anxiety, cost, no perceived need, and low satisfaction with previous dental treatment.

Long waiting times (especially in government hospitals to get an appointment for dental treatment and to be seen by the dentist) emerged as one of the most important factors that prevented mothers from taking their children to see the dentist. Mothers attributed this problem to the lack of dental staff, and short working hours for the government clinics.

All of the Emirati mothers complained about the dentist starting work on their mouths from the first instance that they were seated in the chair, providing little explanation of what was going to happen, and no discussions of any other options available. In short, the result was an increasing use of private dentists rather than the government-sponsored clinic. The private clinic offered more pleasing surroundings, no waiting, and better explanation of the treatment protocol, and so it was a far less anxiety-provoking experience. The lack of positive experiences of the dentist, allied with widespread understanding of the 'worthless' nature of primary teeth, meant that most mothers preferred to spare their children any negative experiences of the dentist and so did not take them at all.

We have to pay attention to the 'second set' of teeth, which will last for life.
[Emirati mother – translated from Arabic]

I take my child to the dentist when he has pain only.
[Emirati mother – translated from Arabic]

For mothers from the other focus groups, the cost was the major prohibiting factor. While for the Egyptian mothers this was onerous but not prohibitive, the cost was a major barrier to accessing dental care for the Yemeni, Palestinian and Sudanese mothers, who often had at least four or five children, and their emergency-driven attendance reflected this.

The reason for not taking our children to the dental clinic is mainly because dental treatment is very expensive.
[Yemeni mother – translated from Arabic]

If the periodical check-up was for free, we would take our children more frequently to the dental clinic.
[Palestinian mother – translated from Arabic]

Anxiety was considered to be another important factor that made mothers unwilling to take their children to the dentist, although one Palestinian mother noted that she always took her children with her to the dentist to observe how painful and unpleasant the treatment was so that they would remember to avoid this by brushing their teeth. They felt that visiting the dental clinic is not a pleasant experience, and therefore they tried to avoid it, although it was believed that modern dental treatment is better than twenty years ago.

When my kids see me in a lot of pain at the dental clinic, they refuse to visit that clinic again for their treatment.
[Palestinian mother – translated from Arabic]

When I visit the dental clinic, I do not take my children with me because they start to panic.
[Yemeni mother – translated from Arabic]

The way a dentist behaves (in term of his or her interpersonal relationships with the mother) lies at the very heart of dental service utilisation. It colours the patient's view of the overall care provided (Schouten *et al*., 2003). Patients are rarely satisfied with dentists whom they perceive to be uncaring, rude, or disrespectful. The mothers do not appear to be asking for anything extraordinary, merely to be treated enthusiastically, respectfully, and, above all, with care. Most agreed that they would like to have more explanation from their dentist, and they felt that dentists working in government hospitals have no time for explanation because they have lots of patients to look after.

Mothers also felt that general dentists were less willing to see younger children, and were more likely to refer them to paediatric dentists. This finding may well reflect the difficulties encountered by dentists who are not specialists in paediatric dentistry when dealing with young children, and these cause some to refuse to treat such cases. In addition, they felt that the availability of specialised clinics would have a major impact on people's willingness to visit the dental clinic.

Children younger than 3 years usually cry when visiting any clinic, we don't see any point of taking them to the dentist because they always say this child is too young for treatment.
[Palestinian mother – translated from Arabic]

We have no idea about milk and salt fluoridation.
[Palestinian mother – translated from Arabic]

What is fluoride gel? We have not heard about it.
[Emirati mother – translated from Arabic]

The dental services would be more efficient if there are dental centres which offer all types of treatment by specialists.
[Emirati mother – translated from Arabic]

Thus, there are many barriers faced by local and non-local mothers in utilising dental health services. Given the widespread aversion to attending the dentist (in all the groups) because of the pain of dental procedures, it was disappointing to also note that none of the mothers had any detailed knowledge of the role of preventive dentistry in maintaining good oral health. The widespread use of the clinics only to treat pain exacerbated this tendency to ignore preventive dentistry. The dominant understanding of the dentist's role was the provision of 'pain relief' rather than preventive care.

DISCUSSION

The recent increased availability of sugar-containing products in the Emirate might have been responsible for increased consumption by young children, resulting in greater dental caries experience. Data from surveys carried out in Arab countries have shown a change in the dietary patterns of mothers and children, with a trend (following that seen elsewhere) towards the consumption of foods rich in fat, cholesterol, salt and sugar (Musaiger, 1996). These changes are likely to have had an effect on oral health. In the UAE, for example, traditional dietary habits and practices have continued, but food and drinks typical of westernised diets are now cheap and readily available, particularly in major cities. The impact of this relatively sudden transition from the traditional way of feeding and preparing children's meals to a new style of living and eating might be another reason for caries development in young children in the Emirates. Other factors that may influence dietary patterns in developing countries include subsidies for sugar production and use (Musaiger, 1996). Such a policy, coupled with rapid population growth in the UAE, probably ensures that sugar will remain a major source of inexpensive food energy for the Emirati population at large.

Most mothers held many misconceptions about diet (for example considering 'nutritious food' to be calorie-dense food), and, as such, they tended to offer sweets to their children to help recover their energy. Sweets were available in many families, but there was sometimes no parental control, suggesting that mothers (especially the low-educated) somehow accepted such behaviour as normal. A long-term prospective study conducted in Finland (Ruottinen *et al*., 2004) strongly suggested that the habit of consuming excessive daily sucrose starts early in childhood and increases the risk of caries in children. Children experiencing caries as infants or toddlers have a much greater probability of subsequent caries in both the primary and permanent dentition (Drury *et al*., 1999), and subsequently as adults (Thomson *et al*., 2004). A UK study by Roberts et al. (2003) showed that children as young as those in junior school (7-8 years old) reported that they had a considerable degree of influence on family purchasing practices with respect to cariogenic food and drink, and that their parents agreed with this finding. In the current study, most of the highly-educated mothers felt that they had no control of their children's diet when they were at work; their children were being cared for by a nanny, and the nannies tended to satisfy the children by allowing them to eat whatever they asked for. This could be because the nannies themselves were not always well educated, and did not understand the importance of minimising sugar intake. To date, unfortunately, no study has explored nannies' oral health attitudes and understanding in the UAE. This is a feature that should be considered by the Ministry of Health in designing and implementing any new oral health preventive program (and when planning dietary counselling for those who care) for children in the UAE.

Many factors influence individual food choice, which is why it is often difficult to try to get people to change what they eat. Physiological, psychological, social, behavioural and economic factors all influence food choice, and all must be considered when facilitating dietary change. The current study showed an interesting contrast to the European trend towards low-income groups having easy access only to foods which are high in sugar or fat. In line with contemporary public health and health promotion philosophy and practice (Watt *et al*., 2001; World Health Organisation, 1986), the emphasis has to be on the attainment of sustainable improvements in oral health through a multidisciplinary approach aimed at altering the underlying determinants of oral health among preschool children (Schou and Locker, 1997) through the development and implementation of appropriate policies to create an oral-health-promoting environment in preschool care settings. This approach has been advocated as an effective way forward for oral health promotion (Kay and Locker, 1996).

With regard to dental service use, some mothers thought that taking the child to the dentist was unnecessary, as 'primary teeth will fall out anyway'. This indicates that mothers had a negative perception of the primary dentition which is consistent with other studies (Maupome, 1998; Riedy *et al*., 2001). In a study of 41 women with children mostly under the age of four years (from various ethnic groups residing on the Island of Saipan, in the Commonwealth of the Northern Mariana Islands), participants were found to be ambivalent toward decayed primary teeth. Most did not like to see cavities in their children's teeth, but felt that the permanent teeth deserved more attention since they needed to last a lifetime (Riedy *et al*., 2001).

However, it has been shown that the oral habits of families

are formative (Paunio, 1994; Mattila *et al*., 2000). If parents do not (or cannot) attend to their own oral health and their dental care, this is likely to be the pattern for their children in the future (Evans *et al*., 1994; Shearer and Thomson, 2010). Parental experiences in receiving dental care (and their beliefs about the effectiveness of preventive dental services) will dictate the success of any preventive programme for young children. Interestingly, most of the mothers in this study were unaware of 'clinical prevention'. They believed that most dental visits had to be a painful experience. The basis of non-threatening dental care should be prevention, and this should form the cornerstone of any long-term care strategy for the dental care of children. Regular asymptomatic dental visits have a cumulative effect (Thomson *et al*., 2010) and may also act to prevent the development of dental anxiety. In this way, children learn to associate positive or neutral effects with asymptomatic dental visiting. For clinical prevention to work in practice, regular attendance by children is necessary; dentists should be adequately remunerated for undertaking this time-consuming work. Preventive interventions (such as the topical application of fluoride) are advocated for children with active caries (Fayle *et al*., 2001) and such non-invasive approaches should do much to build confidence in anxious children and their parents.

Maternal attitudes associated with the quality of the dental experience provided to the child have also been shown to be predictors of the intention to take preschool children to the dentist for a preventive visit (Hendricks *et al*., 1990). A previous focus group study of parents indicated that previous negative maternal dental experiences were influential in their decisions to not seek care. Problems included clinician-patient communication, a poor treatment environment, poor outcomes, and finances (Milgrom *et al*., 1995). Similar points were raised by the mothers who contributed to the current study.

In the focus groups, dentally fearful mothers were more likely not to have been visiting a dentist. These findings support earlier ones (Schuller *et al*., 2003; Thomson *et al*., 2009) that individuals with dental anxiety avoid dental treatment. This (in turn) will have consequences for their oral health. Most of the mothers in this study were afraid of dental visiting, as they were 'not sure' about what was going to happen during that visit. For many patients, not knowing what is going to happen is a major source of anxiety. Preparing patients by giving them information about what will happen is important. Concerns about pain are common, and often implicated in the aetiology of dental anxiety, so giving a realistic assessment of how something will feel helps the patient prepare. This point was raised by many mothers in the focus group sessions. These findings are basically consistent with previous studies, which have shown that the reduction of ambiguity about the situation reduces the anxiety that an individual would experience (Lovibond *et al*., 1990; Ng *et al*., 2004).

In the current study, the high cost of dentistry emerged as one of the most important factors preventing non-local mothers (who were not Emirati citizens) from visiting the dentist. Because private dental treatment requires out-of-pocket payment, people with better socio-economic standing usually use the dental service more often. This observation is consistent with Tudor Hart's 'inverse care law', whereby the availability of health care varies inversely with the need for it in the population served (Tudor Hart, 2000). In the UAE, dental services provided by the government sector are free of charge for all Emirati individuals, but low service utilisation has been observed among them. This indicates that there are barriers other than those of finance alone, and supports the international literature on the use of dental services. Mothers also felt that general dentists were less willing to see younger children, and were more likely to refer them to paediatric dentists. Similar problems were identified in Germany and the Czech Republic (Pine *et al*., 2004). Additional training in paediatric dental management and procedures is needed if the general dental practitioner is to have a role in enhancing access to care for very young children.

This project has demonstrated that caries among Ajmani preschool children is determined by a complex interplay of social, familial, community, and work policies. For the Emirate of Ajman, we suggest that work is needed to promote changes at all of these levels. As well as being an intervention point themselves, the mothers of Ajman have the potential to be a strongly motivating force towards improved oral health for their children. Oral health should not be presented as a supplementary issue that can wait until a child turns 3 years of age, but as one to be valued from birth; an active public health campaign aimed at increasing awareness of such contemporary oral health issues for women with young children is urgently required. Any approach must also recognise that the UAE is a country with a diverse mix of nationalities, religions, languages, and origins.

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