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How pre-school children learn to brush their teeth in Sharjah, United Arab Emirates

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Objective. The objective of this cross-sectional study was to assess tooth brushing habits of pre-school children and to determine the role and amount of supervision given to them by their parents.

Method. One hundred pre-school children below 6 years were selected from Maternal and Child Health Center, Sharjah (United Arab Emirates, UAE). A standard piloted questionnaire was used to collect socio-demographic details and information on oral hygiene practise.

Results. Tooth brushing was stared at a mean age of 16 months. Thirty-seven per cent of the pre-schoolers used a toothbrush for cleaning their teeth and the brushing habits were mainly (70%) introduced by mothers. The majority (80%) of children's tooth brushing at the age of 3 years and above was supervised by mothers. Younger children were frequently supervised in tooth brushing than older children ($P < 0.05$)

Conclusions. In summary, pre-school children of Sharjah (UAE) were introduced to tooth brushing at a mean age of 16 months. Mothers played a pivotal role in introducing and teaching the child how to brush. There was no positive correlation between the brushing behaviour of the mothers and their children. In most cases, the children's brushing was supervised by their mother when they were above 25 months of age. In children less than 12 months of age tooth brushing was not started at all.

Introduction

Maintaining good oral health is important among pre-school children of United Arab Emirates (UAE) as prevalence of dental caries is found to be high in children[1,2]. Tooth brushing is a simple and effective way to remove plaque, thereby preventing dental caries and periodontal disease. There is little information in UAE on the practise of tooth brushing and when and how parents become aware that their child's mouth needs care and attention.

The habit of tooth brushing is introduced by the parent especially the mother in pre-school children[3]. This pattern of behaviour, which is learnt during early years of life, is deeply ingrained in the child's mind and it is expected that this leads to an adaptation of good oral hygiene in their later life[3].

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The ability to learn and to establish regular tooth brushing are two different things; it is believed that guidance on brushing should be given to the children on a continuous basis until appropriate tooth brushing habits have taken root in the children's daily lives[4]. Children under the age of 5 are able to brush their teeth only partially and there is a need for parent or guardian to give a finishing touch to their child's tooth brushing at least up to the age of 5 years or more[4].

It is indeed meaningful to analyse the factors which could influence the way in which pre-school children learn tooth brushing. Hence, this study was undertaken to investigate

1. How and when oral cleaning was introduced to pre-school children and what were the methods used
2. To determine who was responsible for this introduction and supervision given to children
3. To compare the brushing frequency between pre-schoolers and their mothers

Table 1. Descriptive statistics and socio-demographic indicators of the study sample.

Variable	Frequency (%)	
Ethnicity (*n* = 100)		
UAE (Arab)	35	
Other Arab	35	
Indian & other Asians	30	
Education	Fathers (%)	Mothers (%)
No education	2	8
Primary school	8	11
Secondary school	20	15
High school	27	30
College education	43	36
Occupation		
Professional	17	
Administrative	68	5
Unemployed	2	89 (house wife)

Table 2. Number of pre-school children in different age categories.

Variable age range (months)	Number of children (*n* = 100)
0–12	13
13–24	30
25–36	24
37–48	21
>48	12

Material and methods

A cross-sectional study was conducted in one hundred pre-school children with a mean age (month) of 29.40 (SD 15). The distribution of the sample in relation to ethnicity, parental education and occupation are shown in Table 1. Distribution of pre- school children in different age groups is shown in Table 2. Both male and female children were examined but gender differences were not distinguished in this study. The reference population included pre-school children in UAE, Sharjah, whereas the sample was sourced from children attending Maternal and Child Health Center, Sharjah for routine preventive measures. Maternal and Child Health Center, Sharjah city, which received pregnant mothers for their routine maternity follow-up and children less than 6 years for post-natal services, including checking infant growth, immunization, fighting hereditary diseases, and encouraging breast feeding. This is the only Health Centre in Sharjah city and it serves the needs of mothers and their children. A simple random sampling method was used for sample selection. All children attending Maternal and Child Health Center, Sharjah were given a number and then selected using a random digit table. Permission was obtained from the Ministry of Health UAE to conduct the study. Mothers were informed and a written consent was obtained prior to the study.

When mothers brought their children to Maternal and Child Health Center, Sharjah, they were questioned about children's socio-demographic background and tooth brushing habits including traditional methods. A standard piloted questionnaire[5] in Arabic and in some cases in English was used by calibrated researchers to record the information. The data analysis included descriptive statistics. Associations between the tooth brushing with other variables were performed using a chi-square test. The data was analyzed using SPSS version 12 (Chicago, IL, USA) and level of significance was set at $P < 0.05$.

Results

The mean age of the pre-school children was 29.40 (SD 15) months with median of 28 and ranged 6–72 month, whereas the mean age of the fathers was 35 years and mothers 29 years. The results showed that in terms of parents' education, 36% of the mothers and 43% of the fathers had college education, whereas looking at their occupation, 85% of the fathers were professional or associated professional but majority of the mothers, 89%, were housewives (Table 1). The mother reported in this study, the first tooth erupted in the oral cavity was at a mean age (months) of 7.70 (SD 2.1) as reported by the mother through questionnaire. Preschool children started to brush their teeth at a mean age (months) of 16.2 (SD 7.3) but used toothpaste only at a mean age (months) of 19.7 (SD 7.7). Supervision for brushing was stopped at a mean age (months) of 39 (SD 7.7). Positive association was observed between the age at which tooth brushing was started and the age of starting toothpaste in pre-school children ($P < 0.001$).

The majority of mothers (48%) brushed twice a day, whereas in children, the majority

Table 3. Brushing frequency using a tooth brush and a traditional method ''meswak'' by pre-school children and their mothers.

Variable	Pre-school children frequency (%) (*n* = 100)	Mothers frequency (%) (*n* = 100)
Brushing frequency		
Once	39	27
Twice	24	48
Three times	12	23
Never	1	0
Sometime	24	2
Traditional method	4	13

Table 4. Mouth cleaning methods in pre-school children.

Variable	Frequency (%) (*n* = 100)
Toothbrush	37
Gauze moist with water	21
Fingers	13
Traditional method	4
Non	25

brushed once a day, and quarter of the children were brushing when they remembered/sometimes (Table 3). The results of this study showed no statistically significant association between brushing frequencies of mothers and children ($P = 0.534$). Thirty-seven per cent of the pre-school children used a tooth brush to clean their teeth (Table 4). According to the questionnaire, both mothers (13%) and children (4%) used a traditional method 'meswak' for tooth brushing which is twigs from the plant *'salvadora persica'*. Most of the mothers (93%) did not receive any advice from health professionals on when to start and how to brush their children's teeth.

Results concerning the involvement of mothers in introducing the pre-school children to tooth brushing revealed that in children less than 2 years of age, mothers were not involved in 50% of the cases. It was observed that 50% of children below 24 months and all children less than 12 months age were not brushing at all. The introduction to tooth brushing was carried out by the mothers in 70% of children over 13 months of age, whereas fathers played only a minor (3%) role.

Twenty-seven per cent of pre-school children age ranged 13–72 months had received no instructions on tooth brushing. About 50% of pre-school children age 0–24 months were supervised. This figure increased to around 80% for 3 year age group. The association between brushing supervision and pre-school children's age was significant ($P = 0.03$). On analysis of the item 'who does the brushing' in pre-school children, the results suggested that in age groups 0–12 and 13–24, 'no-one' was the most common response, which was followed by mothers to be the second. Yet, for oldest age groups (25–36, 37–48 and >48), mothers and child were the most popular, which showed significant ($P < 0.001$) association with brushing supervision.

Discussion

In this study, we interviewed 100 mothers of pre-school children with a mean age of 29.40 months. It was decided to recruit our sample from Maternal and Child Health Center, Sharjah, as it represented children in the age group that we were interested to study. In relation to the ethnicity of our sample 35% were UAE nationals, whereas majorities (65%) were foreigners.

In this study, tooth brushing was started in pre-school children at the age of 12–18 months (mean age being 16.2 months), whereas toothpaste was introduced later at a mean age of 19.7 months. This indicates that mothers started to brush their children's teeth much later than they had noticed the eruption of the first tooth in the oral cavity at 7.7 (SD 2.1) months (mean age). Majority (more than 50%) of pre-school children started to use toothpaste only at 24 months. The reason for this could be due to consent of ingestion of fluoride toothpaste by pre-school children[6] and advised accordingly by health authorities in UAE.

Comparing tooth brushing frequency of mothers to their pre-school children there is a lack of correlation between the brushing behaviours of mothers and their pre-school children in this study. This is not in line with previous studies which indicated parents' oral behaviour had a direct influence on the

number of decayed teeth in their children[7]. Although the results of this study showed lack of significant correlation between brushing frequency of mothers to their pre-school children, it should be noted from Table 3 that the total of 98% of the mothers brushed either once, twice, or thrice a day. This good oral hygiene practise in their mothers has resulted in 75% of pre-school children to brush their teeth. The lack of dental health education to pre-school children and their mothers could be the reason for a big proportion of children brushing their teeth only once a day and a quarter brushing their teeth infrequently or not at all.

The use of traditional method such as meswak chewing stick continues to be an important tool for oral hygiene in many Afro-Asian communities. Children using this traditional method of tooth brushing have learnt this practise from their mothers who themselves used this method. Indicating that children imitated the use of traditional method of tooth bushing from their mothers, this pattern of behaviour has been previously reported in literature[8]. The traditional method used for tooth brushing reported in this study could be due to the influence of culture and religious practises in this part of the world.

In this report, introduction to tooth brushing in pre-school children was mainly by the mothers. The results of this study support findings of Blinkhorn[9], which emphasized on the role of the mother in introducing the child to tooth brushing. It is interesting to note the way in which tooth brushing was introduced amongst these children was mainly by tooth brush (37%) and 4% by traditional methods.

Tooth brushing in pre-school children was supervised by mothers and this percentage increased with the child's age, but a small proportion of children were not brushing their teeth at all in this study. In reference to brushing supervision, other studies have also reported similar findings[10]. Although analyzing the reasons given by parents for not supervising tooth brushing, were the child knew how to brush, large family size and in few cases child wanted to brush their teeth by themselves. It is interesting to observe that tooth brushing, which was exclusively carried out by the child were few, whereas in most cases brushing was shared by mother and the child. This finding is not in correlation with previous report[11] where 40% of pre-school children refused parents help for brushing.

Conclusions

In summary, pre-school children of Sharjah (UAE) were introduced to mouth cleaning by toothbrush at a mean age of 16 months. Mothers played a pivotal role in introducing and teaching the child how to brush. There was no positive correlation between the brushing behaviour of the mothers and among pre-schoolers. When pre-schooler was above 25 months of age tooth brushing was carried out by the mother and the child.

What this paper adds

- Mothers play a pivotal role in introducing and teaching their pre-school children to brush their teeth.
- Mothers of pre-schoolers in Sharjah (UAE) were responsible for future development of a good oral hygiene practises in their children.
- Preschool children were introduced to toothbrush only at the age 16 months.
- Tooth paste was used only for children >24 months of age.

Why this paper is important to paediatric dentists

- This paper emphasizes on the importance of providing parental guidance to introduce oral hygiene with eruption of the first tooth, as mothers in Sharjah (UAE) were not aware when they should commence tooth brushing in their pre-schoolers.
- Importance of oral health education and promotion to mothers by health personnel during routine health check-ups and dental visits of pre-school children.
- Importance of promoting earlier start of use of fluoride tooth paste to prevent dental caries in UAE.

References

1 Hashim R, Thomson WM, Ayers KM, Lewsey JD, Awad M. Dental caries experience and use of dental services among pre-school children in Ajman, UAE. *Int J Paediatr Dent* 2006; **16**: 257–262.

2 Al-Hosani E, Rugg-Gunn A. Combination of low parental educational attainment and high parental income related to high caries experience in pre-school children in Abu Dhabi. *Community Dent Oral Epidemiol* 1998; **26**: 31–36.

3 Mohebbi SZ, Virtanen JI, Murtomaa H, Vahid-Golpayegani M, Vehkalahti MM. Mothers as facilitators of oral hygiene in early childhood. *Int J Paediatr Dent* 2008; **18**: 48–55.
4 Finlayson TL, Siefert K, Ismail AI, Sohn W. Maternal self-efficacy and 1-5 year-old children's brushing habits. *Community Dent Oral Epidemiol* 2007; **35**: 272–281.
5 Davenport ES, Litenas C, Barbayiannis P, Williams CE. The effects of diet, breast-feeding and weaning on caries risk for pre-term and low birth weight children. *Int J Paediatr Dent* 2004; **14**: 251–259.
6 Simard Pl, Naccache H, La Chapelle D, Brodevr JM. Ingestion of fluoride form dentifrices by children aged 12 to 24 months. *Clin Pediatr (Phila)* 1991; **30**: 614–617.
7 Okada M, Kawamura M, Kaihara Y *et al.* Influence of parents' oral health behaviour on oral health status of their school children: an exploratory study employing a causal modeling technique. *Int J Paediatr Dent* 2002; **12**: 101–108.
8 Chen MS. Children's preventive dental behaviour in relation to their mothers' socioeconomic status, health beliefs and dental behaviour. *ASDC J Dent Child* 1986; **53**: 105–109.
9 Blinkhorn AS. Factors influencing the transmission of the toothbrushing routine by mother to their pre-school children. *J Dent* 1980; **8**: 307–311.
10 Zeedyk MS, Longbottom C, Pitts NB. Tooth-brushing practice of parents and toddlers: study of home-based videotaped session. *Caries Res* 2005; **39**: 27–33.
11 Blinkhorn AS, Wainwright-stringer YM, Holloway PJ. Dental health knowledge and attitude of regular attending mothers of high-risk, pre-school children. *Int Dent J* 2001; **51**: 435–438.