

Status of dental caries among 4-9 year-old children attending dental clinic in a military hospital in Tabuk, KSA

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هدفت هذه الدراسة إلى إيجاد معدل النخر والحشو والخلع لأسنان الأطفال بعمر من ٤ إلى ٩ سنوات من المترددين على عيادات الأسنان ببرنامج مستشفيات القوات المسلحة بتبوك بالمملكة العربية السعودية. وهدفت الدراسة كذلك لتعريف العوامل المرتبطة بعدد الأسنان المصابة. وقد شارك في الدراسة ٣٤٤ طفل مع آبائهم من المترددين على عيادة الأسنان. كما شارك أربعة استشاريين في طب أسنان الأطفال وقد تم تدريبهم للتأكد من استخدامهم معايير متماثلة لفحص الأسنان. كما تم استخدام طريقة منظمة الصحة العلمية لفحص نخر الأسنان. أجاب الآباء على استبيان عن صحة فم الأطفال وعادات زيارة طبيب الأسنان وتنظيف الأسنان بالإضافة لبعض الأسئلة عن الخصائص الاجتماعية للأسرة. وقد وجدنا أن معدل النخر والحشو والخلع هو ٦,٦ ورغم ارتفاع هذا المعدل إلا أنه كان مشابهاً لما وجد في دراسات شبيهة بدول الخليج. كما وجدنا أن نظافة الأسنان و عدد أفراد الأسرة ومستوى تعليم الأم كانت من العوامل المؤثرة إحصائياً على هذا المرض. كما اتضح أن ٩٢,٣٪ من الأطفال حضروا للعيادة بدون موعد سابق، وأن غالبيتهم يحضرون بسبب آلام الأسنان أو التسوس أو التورم أو تحرك الأسنان مما يسبب ضغطاً على خدمات الطوارئ بالعيادة ويؤثر سلباً على قدرة الأطباء على تقديم علاج شامل للأطفال لمعالجة التسوس. وللغضاء على هذه الظاهرة فإن علينا أن نخطط ونعد لبرامج طب الأسنان الوقائي.

This study aimed at assessing the prevalence and determinants of dmft in a sample of 4-9 year-old children attending military hospital in Tabuk Saudi Arabia. Three hundred forty-four children and their respective parents were selected. Four consultant pediatric dentists trained to ensure reliability in the diagnosis using the World Health Organization criteria for diagnosis of caries carried out the examination. Parents completed a questionnaire on dental history, patterns of attendance, oral hygiene practice and demographic data. The dmft (6.6) for the children was high, but consistent with other studies in the Gulf Community. Oral hygiene, family size and mother's education were significantly associated with the disease. The majority of patients (92.3%) attended the dental clinic without prior appointment and the major complaints were pain, swelling, dental decay or mobility. This placed constant pressure on emergency dental services at the expense of resources needed for comprehensive dental services to address the high untreated caries in the population. To break this cycle, planners of dental services should maintain focus and develop significant strategy for preventive dental services to improve the future quality of oral health and life in the region.

INTRODUCTION

Many studies¹⁻¹⁵ undertaken in countries on the Arabian Peninsula have reported a very high level of decayed, missing and filled primary teeth (dmft) commonly associated with relatively high and frequent consumption of sweets.^{8, 10, 11, 15} Dental caries account for a repeated cycle of pain, loss of sleep, missed schoolwork and emergency dental care, which takes its toll on families and communities.^{16,17,18} Furthermore dental treatment tends to be more complicated, expensive and time-consuming.^{10,11,19}

For many parents, the primary dentition is perceived to have little or no value and that early childhood caries are a normal childhood-disease that afflicts the most children. Premature loss of primary teeth is often accepted as part of growing up,^{16,20} and this attitude may be carried on into adulthood making the loss of permanent teeth and being edentulous at old age a normal process of ageing.^{16,21} Unfortunately, a great number of patients define oral health by the presence or absence of pain, thus attending the hospital only during painful episodes, leading to over-utilization of emergency services and taxing of human resources.^{16,22,23}

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The aims of this study were: (1) to examine the prevalence of dmft among 4-9 year-old children attending the military hospital in Tabuk, Saudi Arabia and (2) to assess the social and behavioral characteristics of the children and their parents. Finally, we examined the findings from other studies of dmft in the Arabian Peninsula to determine the trend in children dental caries in this region and its implications for oral health policy.

METHOD

A convenient sample of 344 children aged between 4-9 years, who attended dental treatment during normal working hours at the North West Armed Forces Hospitals (NWAFFH) in Tabuk, Saudi Arabia, and their respective parents participated in the study during the year 2003. Since the NWAFFH is mainly a treatment facility, the research work had to be distributed among four pediatric dentist consultants. They were trained and calibrated for inter-examiner reliability prior to the commencement of the study to ensure uniform recording of dmft. They used the World Health Organization criteria for diagnosis of caries (World Health Organization Manual for Dental Surveys).²⁴ Ten percent of the patients were reexamined by one consultant (G.O.) to ensure reliability in the diagnosis of caries. Kappa analysis was done to assess reliability.

A questionnaire was administered to parents, which included questions on past dental history, patterns of attendance (regular visits to dentist or emergency visits), oral hygiene practices (tooth brushing), socioeconomic and demographic information related to both parents and children (e.g., parents' education, jobs, income, area of residence, family size). When necessary, assistance was offered to parents to complete the

questionnaire. Coded numbers were assigned to patients in compliance with the NWAFFH Medical Research Committee Guidelines on patient's privacy. Only persons directly involved in the research project had access to the questionnaires and the computer data. Information related to dental status and demographic data was aggregated and analyzed using SPSS software program and student t-test was used to examine factors significantly associated with increased dmft.

A literature search was conducted to identify similar studies in the Gulf countries and to examine trends in the dmft in this region.

RESULTS

Inter-examiner reliability in the diagnosis of dental caries was high (kappa = 0.85). The mean age of the children was 5.57 years (standard deviation = 1.87), range 4-9 years. Distribution by gender was 50.07% males and 49.93% females. The mean dmft value was 6.6. The "d" component was very high (5.35) as shown in Table 1.

Table 1. DMFT among 4-9 year-old children attending dental department at NWAFFH in Tabuk, Saudi Arabia (n=344)

	Mean	Std deviation	Max	Min
dmft	6.6	4.17	20	0
d (% of total dmft)	5.35(81.06%)			
m (% of total dmft)	0.64 (9.7%)			
f (% of total dmft)	0.61 (9.24%)			

Only 7.7% of children had previous appointment given by the dentist, 55.3% had a walk in appointment given to them the previous day. Thirty seven percent of the children were seen as emergency patients for severe and sudden dental problem, and they could only receive emergency services. The majority of the patients (57%) were attending for the first

Table 2. Main chief complaint and reason for dental visit as reported by parents (n=344)

Chief complaint	Percentage
Dental caries	24.6%
Tooth mobility	2.3%
Dental pain	55%
Swelling	11%
Others	7.1%

time, 20.8% for the second and 19.4% for the third or more time.

Table 2 shows most common chief complaints or reason for attending dental clinic: dental pain (55%) and caries (24.6%). Only 18 % of patients had a history of a previous comprehensive dental examination. In relation to oral hygiene practices, the majority of patients (46%) claimed to brush once daily, 35% said they brushed more than one time and approximately 19% never brushed at all.

Relatively large families were common, 52% of the children having four or more siblings. Most mothers (53.4%) had only received education at primary school or lower level, 19.2% had intermediate schooling, while only 26.4% had a high school or a higher education diploma. Very few mothers (11.5%) had employment outside the home, and 25 % of families had live-in domestic help.

The dental attendance patterns for parents were similar to those of their offspring, most (42%) having visited a dentist for emergency only and 29% had never visited a dentist. When asked the reasons preventing them from visiting the dentist most parents (87%) cited difficulty in getting an appointment to see a dentist, 9% mentioned lack of time, 3% for perception of oral health not important and only 1% said fear of dentist was the reason for not visiting a dentist.

Factors which showed significant association with increased dmft scores were lack of tooth brushing, number of siblings more than 4 and the level of mother's education at intermediate school or less (Table 3). Other factors, including

Table 3. Factors significantly associated with increase in dmft

Factor	Mean	Difference in mean	Significance	Std error of difference of mean
Child brush teeth	No	7.43	P<0.01	0.45
	Yes	6.01		
Number of siblings	More than 4	7.07	P<0.05	0.44
	4 or less	6.02		
Mother education	Intermediate or less	6.86	P<0.05	0.50
	Secondary education or more	5.81		

employment of live-in domestic help, mother employment, and type of visit to the dentist (regular visits or emergencies) were not significantly association with the dmft score.

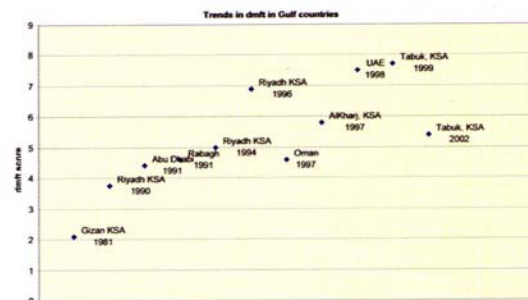


Fig. 1. Graph showing trends in dmft in the gulf countries between 1981 till 2002

DISCUSSION

In this study we examined a sample of 4-9 year-old children who attended our dental clinics for dmft score. Although this sample does not represent the whole population of Tabuk, but the mean dmft was consistent with that reported in other studies of dmft in the Gulf Countries.^{1,2,4,5,7,9-14} These findings could be partly attributed to the similarities in culture, increasing affluence and the effect of modernization. The frequent consumption of sweets appears to begin at an early age and continues throughout

the elementary and secondary school years.¹⁰ In the current study the majority of parents confirmed that their children indulged in sweets frequently. In a previous study in Tabuk, 68.5 % of grades 1 and 6 children consumed sweets twice or more each day.¹⁰ Another study² found that children as young as 17 months with no oral hygiene practices had commenced eating cariogenic snacks. In the current study, 46 % of children claimed to brush their teeth only once a day and 19% never brushed their teeth at all. The low frequency of tooth brushing is similar to findings in a previous study which had a sample representative of children of Tabuk.¹⁰ The current study showed a significant association between low brushing frequency and increased dmft values.

The influence of large families may be critical in the prevention of dental caries, because the number of siblings in a family had a significant association with the increase in dmft score in this study. This is in accordance with the observation, that children from larger families were less likely to receive adequate care or home supervision.¹⁶ The mother's education level and caries prevalence in the current study were inversely proportional and agreed with two other studies in Saudi Arabia, suggesting that oral health promotion strategies should be geared towards new and expectant mothers.^{11,25}

Most children (92.3%) attending the NWAFFH dental clinic were seen without appointment. As a result, a high proportion of pediatric dental services have essentially been in the form of emergency care¹⁸ thus placing a heavy load on emergency services and making little impact on reducing the levels of untreated decayed teeth. The untreated decay component of the dmft has been reported to be as high as 81%. This situation has created the dilemma of having to deliver comprehensive dental

treatment to a small percentage of the population, while limiting the majority of patients to emergency services only. Also, compounding the ever increasing dental decay and demand for services is the declining dentist/population ratio.

The majority (55%) of children in this study came in with pain and associated caries, swelling or mobility. These findings were consistent with a previous study¹⁸ in Tabuk citing a high prevalence of dental pain, which clearly affected the quality of children's lives in eating, sleeping, playing and school attendance.^{17,18} The latter study also reported that guardians were frequently forced to leave the workplace in order to accompany children to visit the dentist. The impact of dental pain is thus felt community-wide, especially in relation to work attendance and productivity.¹⁸

When the parents were inquired about their own dental habits, a significant number (42%) visited a dentist only on emergency basis, similar to the pattern observed for their children, claiming difficulty in obtaining an appointment as the main reason.

Results from other dmft studies in Arabian Peninsula showed a steady rise in dmft score in these countries over the years.^{1,2,4,5,7,9-14} This is shown in Figure 1. This implies a trend in dental caries. Many children from the gulf region may be exposed to urbanization, affluence, modernization and a completely new world that provides a lot of opportunities, excesses, indulgence and the associated hazards and risks. Young children of today should be educated and given the skills to take advantage of the opportunities and protect themselves from its perils. Food in one hand, and a toothbrush in the other! Dental education and caries prevention, in the long run, will prove to be the only feasible and viable solution to this young and upcoming generation.

To reduce the high levels of caries in this age group, emphasis has to be shifted from a restorative to a preventive oriented dental service. There should be an increased exposure to fluorides, and observed eruption of permanent molars with a view to the timely application of fissure sealants.¹⁰ The essential role of dental services in reducing dental caries in the future may rest in the non-invasive dental services, such as fluoridation, fissure sealants, non-cariogenic snacks and drinks in schools, and oral health education.^{10, 26}

At the time that the current study was undertaken, the NWAFFH Program had implemented an oral health program that was attempting to tackle the high dental caries problem in the community, mainly through parental education in well baby clinics, oral health education in schools and fissure sealant programs. Plans had been made for a Child Dental Health Centre in order to systematically undertake caries risk assessment for elementary school children with a view to applying appropriate strategies to the various risk groups. However, these oral health programs, though shown to be cost-effective in numerous other international communities,^{27,28} appear to have lacked local as well as national support, and therefore require a more definitive MODA strategy to provide more financial commitment to oral health prevention.

CONCLUSIONS

A high level of dental caries was found in the studied 4-9 year old group. Most of the pediatric dental services at the NWAFFH Program have been in the form of emergency care of pain relief, making little or no impact on reducing the levels of untreated dental decay, thus creating unmet needs for comprehensive dental care among this age group. The three

factors found associated with the increase in dmft index in children attending the NWAFFH dental clinic were the number of siblings in a family, the low frequency of tooth brushing and the level of mothers' education. Parents had the same trends in dental habits as their offspring and most visited a dentist episodically, usually when in pain. With this big picture in mind, planners of dental services should develop new national strategies to support oral health education and caries prevention.

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