

Dental caries among schoolchildren: report of a health education campaign in Jeddah, Saudi Arabia

M.B.S. Gandeh¹ and W.A. Milaat²

تسوس الأسنان بين تلاميذ المدارس: تقرير عن حملة للتثقيف الصحي في جدة، المملكة العربية السعودية

محمد بكر صالح قاندية ووليد عبد الله ملعاط

خلاصة: تصف هذه المقالة حملة للتثقيف حول صحة الأسنان، وتقدم تقريراً حول وبائيات تسوس الأسنان ومعدلات انتشاره بين تلاميذ وتلميذات المدارس الابتدائية في جدة. فخلال فترة دامت عامين، تمت زيارة سائر المدارس الابتدائية المسوية في جدة وعددها 296 مدرسة، من قِبَل أطباء أسنان يجرون حملة للتثقيف الصحي. وتم تحري 82 250 تلميذاً في السنوات الدراسية الأولى والرابعة. وتبين أن معدل تسوس الأسنان المكتشف كان 83%. وكانت المعدلات أعلى بدرجة يعتد بها إحصائياً بين الإناث وبين تلاميذ السنة الدراسية الأولى. كما أن تدني المستوى الاجتماعي كان مصحوباً بمعدلات لتسوس الأسنان أعلى بدرجة يعتد بها إحصائياً. وتشدد هذه الدراسة على أهمية برامج التثقيف الصحي، وفائدة المسوحات الصحية المدرسية التي تستهدف هذه الفئة من صغار السن.

ABSTRACT The study describes a dental health education campaign and reports the epidemiology and prevalence rates of dental caries among male and female primary-school children in Jeddah. Over a 2-year period, all 296 public primary schools in Jeddah were visited by dentists conducting a health education campaign. A total of 82 250 children in the first and fourth grades were screened. The rate of detected dental caries was 83%, with significantly higher rates detected among females and first-grade children. Lower social class was significantly associated with higher rates of dental caries. The study emphasizes the importance of health education programmes and the value of school health surveys for targeting this young group.

La carie dentaire chez les écoliers: rapport d'une campagne d'éducation sanitaire à Djeddah (Arabie saoudite)

RESUME L'étude décrit une campagne d'éducation en santé dentaire et rend compte de l'épidémiologie et des taux de prévalence de la carie dentaire chez les écoliers – garçons et filles – du primaire à Djeddah. Sur une période de deux ans, l'ensemble des 296 écoles primaires publiques de Djeddah ont reçu la visite de dentistes qui réalisaient une campagne d'éducation sanitaire. Un dépistage a été réalisé sur un total de 82 250 enfants de la première et de la quatrième classe. Le taux de caries dentaires détectées était de 83% avec un taux de détection considérablement plus élevé chez les filles et les enfants de la première classe. La classe sociale inférieure était associée de manière significative avec des taux élevés de caries dentaires. L'étude souligne l'importance des programmes d'éducation sanitaire et la valeur des enquêtes de santé scolaire pour cibler ce groupe de jeunes.

¹Primary Health Care Department, Ministry of Health, Jeddah, Saudi Arabia.

²Community Medicine Department, Medical College, King Abdul Aziz University, Jeddah, Saudi Arabia.

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Introduction

Dental caries is a major public health problem among schoolchildren in Saudi Arabia. They are the main cause of tooth mortality, presentation of dental emergencies and tooth extraction in this group. The many causes of dental caries include poor dietary habits, poor oral hygiene and lack of dental care [1-4]. Methods to combat this problem include dissemination of dental health messages, promotion of good personal dental care and regular dental check-ups. Recognizing the importance of these strategies, in 1996 the Jeddah Primary Health Care (PHC) Directorate launched an annual health education campaign in primary schools to increase awareness among children. This paper describes the work-up and implementation of the health education and screening activities of the campaign, reports the prevalence rates of dental caries among male and female primary-school children over 2 consecutive years and outlines some of the epidemiological factors associated with dental caries.

Methods

All 296 public primary schools in Jeddah were registered for visitations by 18 dentists over 4-week periods during 1996 and 1997. A preparatory visit by each dentist to his or her assigned schools was carried out to ensure the participation of the school staff, prepare the health education setting and organize the dental screening. All children were targeted for the health education activities conducted by the dentists and their assistants in classrooms and school theatres. These activities included: teaching children about plaque detection using the coloured tablet technique provided by Unilever, explaining the right method of

toothbrushing using the jaw model, distributing free toothbrushes and toothpaste, broaching dental health education messages through scientific and cultural school activities and distributing health education pamphlets and flyers.

Screening to determine the prevalence of clinically identifiable dental caries was limited to children in the first grade (6-7 years of age) at the time of the eruption of the first permanent molar teeth, and fourth grade (10-11 years of age) at the time of the ending of mixed dentition. Screening was carried out by simple dental examination in the classroom setting using the World Health Organization diagnostic criteria for oral health surveys [5]. The decayed, missing and filled (DMF) index was not used, as it was not expected to find missing and filled teeth in large numbers among these age groups [6]. Dental caries detected were either treated in the mobile clinic or referred to designated dental clinics at nearby primary health care centres. Unscreened children in other grades were asked to consult the nearest dental clinic for screening.

Children were divided into two distinct social classes (low and high) according to the known socioeconomic status of the geographical districts in which the schools are located. Rates of dental caries were calculated for each school grade, sex and social class to test possible significant differences among them using the χ_2 statistical significance test.

Results

Of the 296 Jeddah schools, 259 and 264 primary schools were visited during 1996 and 1997 respectively. Of the estimated total of more than 240 000 students, the number of children screened in the first and fourth grades was 82 250 (50.3% screened

Table 1 Distribution of children by sex and dental caries in Jeddah primary schools, 1996-7

Sex	Presence of dental caries				Total	χ_2	P-value
	Yes		No				
	No.	%	No.	%			
Male	31 494	80.3	7 712	19.7	39 206	321.2	< 0.0001
Female	36 770	85.4	6 274	14.6	43 044		
Total	68 264	83.0	13 986	17.0	82 250		

Table 2 Distribution of children by sex, school grade and dental caries in Jeddah primary schools, 1996-7

Sex and grade	Presence of dental caries				Total	χ_2	P-value
	Yes		No				
	No.	%	No.	%			
<i>Male</i>							
First grade	15 764	81.5	3 583	18.5	19 347	32.9	< 0.0001
Fourth grade	15 730	79.2	4 129	20.8	19 859		
<i>Female</i>							
First grade	17 035	85.4	2 914	14.6	19 949	0.027	> 0.05
Fourth grade	19 735	85.5	3 360	14.5	23 095		

Table 3 Distribution of children by sex, social class and presence of dental caries in Jeddah primary schools, 1996-7

Sex and social class	Presence of dental caries				Total	χ_2	P-value
	Yes		No				
	No.	%	No.	%			
<i>Male</i>							
High	9 711	76.8	2 932	23.2	12 643	142.9	< 0.0001
Low	21 419	82.2	4 714	17.8	26 133		
<i>Female</i>							
High	13 097	77.8	3 728	22.2	16 825	1042.7	< 0.0001
Low	21 522	89.5	2 518	10.5	24 040		

The totals in this table are not equal to the others because of missing data

in 1996 and 49.7% screened in 1997). The general prevalence rate of positively detected cases of any level of dental caries

was 83% among children in both the first and fourth grades for the 2 years. Table 1 compares the specific prevalence among

male and female children. Table 2 details the number of male and female children screened and the prevalence of positively detected cases of any level of dental caries among them by grade. It can be seen from both tables that female children showed higher rates in both grades. Rates of dental caries showed significant differences according to social class (Table 3). Low social classes had a significantly higher rate in both sexes ($P < 0.0001$).

Discussion

Determining the prevalence of dental caries is a necessary step for health care planners to identify resources needed for dental services in the community and to provide preventive and curative services to combat dental health problems. Field surveys in this cross-sectional design are important tools to describe the status of dental problems in the community, but they cannot be used to isolate specific relationships between various parameters studied and the cumulative effect of dental caries [7]. Nevertheless, the impact of these surveys is quite significant and their use is justifiable in mass dental screening, diagnosis and referral of individual cases and dissemination of the proper dental care practices among the population.

The 83% rate of dental caries documented for primary-school children is high and it is an endemic problem of high prevalence among both sexes. Similar studies in Saudi Arabia have noted high rates of dental caries and other related tooth mortality in the range of 44% and 68% among both primary-school children and the young population in general [1,7]. One of the main underlying causes suspected is dietary patterns among schoolchildren [8]. Poor dental care practic-

es and a service shortage to these groups are other factors documented in Saudi Arabia [9,10]. Studies from other developing countries report similarly high rates. A recent study in Panama calculated a very low rate (6.8%) of 12-year-old schoolchildren who were caries-free [11]. Another study from Brazil showed the prevalence of dental caries in 5- and 6-year-old children to be 57% and 89% in two areas with early and late histories of fluoridation of water respectively [12]. Al-Khateeb found low fluoridation of water was a significant cause of higher rates of caries in Jeddah schools compared with Mecca and Rabagh schools [6].

The rate of dental caries was found to be higher among female children in both age groups and different social classes. This gender difference has not been documented in previous studies in Saudi Arabia, but has been noted in American studies and in a recent survey in the Islamic Republic of Iran [13,14]. Greater exposure of males than females in Saudi Arabia to health services is a possible explanation for this difference [15]. Another explanation could be interobserver variation among male and female dentists who visited the schools, as visits to each school were limited to dentists of the same sex as the students.

Social class difference showed an important association with the prevalence of dental caries in Jeddah. Many studies have documented the effects of social class, including higher levels of family education, higher awareness of dental health matters and greater use of dental health services [6,13,16].

Conclusion

This survey study documents an alarmingly high rate of dental caries among schoolchil-

dren in Jeddah, with greater prevalence among younger children, females and those of lower social class. Although results from the study should be interpreted with caution as simple survey diagnostic methods were used, the findings can form a basis for planning dental health programmes for this age group. Such school surveys can measure the effects of dental health education campaigns in reducing dental mortality and enhancing preventive measures in dental care, including sound oral hygiene and diet modification in these young and easily targeted schoolchildren.

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