

COMPARISON OF CARIES IN 6-7 YEAR OLD SAUDI GIRLS ATTENDING PUBLIC AND ARMED FORCES SCHOOLS IN RIYADH, SAUDI ARABIA

Dr. Magda Mansour,* BDS, MSc
Dr. Shahid Anwar,t BDS, MSc, DDPH RCS, FRACDS
Dr. Cynthia Pine,* BDS, PhD, FDSRCS

الهدف من الدراسة هو اكتشاف ومقارنة نسبة التسوس بين الأطفال الذين تتراوح أعمارهم بين الست والسبع سنوات في مدارس البنات والاتي يراجعن المستشفيات العامة أو العسكرية بالرياض، وتوفير قاعدة بيانات أساسية لاستخدامها مستقبلاً لتطوير صحة الفم والأسنان في مدارس البنات بالمملكة.

تم اختيار ثلاث مدارس عامة وثلاث مدارس تنتمي لوزارة الدفاع والطيران اختياراً عشوائياً وتم فحص ١٠٠ طفل من المدرسة، وتبين أن متوسط الأسنان النخرة والمفقودة والمحشوة للبنات في المدارس العامة كان ٦ (بمعدل انحراف ٣,٧) أما بالنسبة لمدارس وزارة الدفاع فكان المتوسط ٨,١ (بمعدل انحراف ٤,١). ونسبة الأسنان الغير نخرة كانت ٧,١% للذكور في المدارس العامة و ٣% للمدارس الثانية بالترتيب وكان هناك اختلافاً إحصائياً واضحاً بين المتوسط الحسابي للأسنان المفقودة والمحشوة والمنخورة والذي كان ($P < 0.01$) تقريباً أما المتوسط الحسابي للأطفال الغير مصابين بالنخر فكان ($P < 0.05$) تقريباً في كل من النوعين المختارين.

يتضح من ذلك الحاجة إلى الارتقاء بصحة الفم والعناية بالأطفال بين الست والسبع سنوات بمدارس الإناث بالمملكة.

The purpose of this study was to determine and compare the prevalence of caries among 6-7 year old Saudi school girls attending the public and Armed Forces schools in Riyadh and to provide baseline data for future interventions in the development of oral health care. Three public and three Armed Forces schools were randomly selected and 100 children from each type of school were examined. Mean dmft for girls attending public schools was 6.0 (SD ± 3.7) and was 8.1 (SD ± 4.1) for Armed Forces schools while caries-free dentitions were 7.1% and 3.0%, respectively. There was a statistically significant difference between the means for dmft ($P < 0.01$) and those for caries-free children ($P < 0.05$), among the two types of schools examined. Clearly, there is a real need for oral health promotion and care for the Saudi school girls 6-7 years of age.

Introduction

Socio-economic status has been associated with caries in numerous studies.^{1,2} Silverstone pointed out the effect of social status on the diet, oral hygiene practices, dental services uptake of both individuals and communities.³ These factors were found to have an effect on the dmft level. Various indices have been used in survey work to measure the effect of social class on caries. These indices seek to measure the socio-economic status of individuals. The most common one used are: occupation of father or head of the family,^{4,5} the Registrar General's Classification,⁶ and number of rooms and toilets in the house.⁷

Received 08 December 1998; Revised 06 April 1999;
Accepted 01 May 1999

*Senior Registrar, Dentistry Department, Riyadh Armed Forces Hospital, P.O. Box 1394, Riyadh 1143, KSA

In developing countries, it is very difficult to designate a particular social class to a household. No single system for classification has yet been developed and tested, and which is also true for Saudi Arabia. However, many more have been devised and used according to the types of people and places being surveyed. Examples are ACORN (A Classification of Residential Neighborhood), a system based on census statistics.⁸ In Guatemala, the type of footwear used by subjects was the basis for classification.⁹

Anwar and Downer¹⁰ used different types of schools as a basis for differentiating between the children and comparing their oral health status. It has also been pointed out that the type of school has a direct effect on caries risk

Consultant, Dentistry Department, Riyadh Armed Forces Hospital, D-165, P.O. Box 7897, Riyadh 11159

*Head, Dental Public Health, Dental School, University of Dundee, Park Place, Dundee DD1 4HR, UK

Address reprint requests to :

Dr. Magda Mansour

status.¹¹ In Saudi Arabia, the schools for the Saudis are segregated by gender. This study only focused on Saudi girls studying in different types of schools. Earlier studies in the Kingdom have concentrated only on either pre-schoolers,¹² or on the population of children 12 years and older.¹³ In both of these age groups, the prevalence of deciduous caries or the end result of the carious lesions in deciduous dentition cannot be evaluated.¹⁴ Such information is necessary to plan provision for dental care and the level of oral health education and promotion required.

Materials and Methods

Three public schools, out of 30, and 3 armed forces schools out of 9 were randomly selected from the list of schools provided by the concerned departments. The ages of the subjects ranged from 6-7.5 years. Because of constraints in time and logistics, the authors decided to examine 100 female children from each type of school.

A list of students of Saudi descent was obtained from each selected school. The class teacher was asked to select every third girl on the list from each section, until 100 children were obtained from each type of school. The head mistresses of the schools were asked to ensure the presence of the selected child on the day of the examination. Written consent from the individual parent was not deemed necessary by the authorities as the clinical examination was only visual and no radiographs were conducted.

The instrument used for examination included a sickle-shaped explorer and the data was recorded on examination forms. The clinical examination was carried out with the help of a scribe. Students were seated on a straight-backed chair facing sunlight in the school premises. Dental caries was assessed using the WHO methodology,¹⁵ under standardized conditions. Ten percent (10%) of the subjects were re-examined and an intra-examiner reproducibility of Kappa = 0.85 was achieved.

Data was entered in a personal computer and the SPSS program was used for statistical analysis of the data. T-test was used to determine the presence of any statistically significant

difference between the two types of schools and a p-value of 0.05 or less was considered significant.

Results

Ninety-nine Saudi girls were examined in the public schools. Their mean dmft was 6.0 (SD \pm 3.7), the dt was the greatest component at 4.8 (SD \pm 3.6) and 7.1% were caries-free. In comparison, mean dmft and the dt factor of the girls from the Armed Forces schools were 8.1 (SD \pm 4.1) and 6.3 (SD \pm 4.2), respectively; 3.0% were caries-free (Table 1).

Table 1. Caries experience in the school children.

Teeth	Public Schools n=99		Armed Forces School n=101		Statistical significance
	Mean	S.D	Mean	S.D	
dmft	6.0	3.7	8.1	4.1	P < 0.01
dt	4.8	3.6	6.3	4.2	
mt	0.5	1.0	0.7	1.2	
ft	0.7	1.3	1.0	1.7	
% dmft = 0	7.1		3.0		P < 0.05

Table 1 shows that there was a statistically significant difference between the mean dmft (PO.01) and the caries-free children (PO.05) in the two types of schools examined.

Discussion

Many epidemiological reports from the Riyadh region¹⁹ in Saudi Arabia show an increase in the prevalence of dental caries.^{16,17,18} Earlier studies compared the dmft between the Saudi boys and girls and no statistically significant difference in caries prevalence was reported. Others found a higher caries prevalence in boys.¹⁷ Al Sekait found more caries in girls in his study.¹⁶

The present study focused on the caries status in girls and compared the differences between the public and Armed Forces schools. Although the combined dmft of 7.08 is in line with the previous studies for Riyadh region¹⁹ and for Abu Dhabi,²⁰ the present figures are definitely higher

than those reported in other studies in Saudi Arabia.^{11,21} The percentage of caries-free children has declined in comparison with the previous studies in Saudi Arabia^{21,22} and in the Middle East.¹⁴

The statistically significant difference between the caries levels in the public and Armed Forces schools is also noteworthy. Further studies are required to look into the causes for this difference. This study compared the Armed Forces schools with public schools. No such comparison has been reported in Saudi Arabia. A study to investigate the dmfts of the families of USAF was carried out, however.²³

The statistical figures reported in the present study may be treated with caution as the number of subjects was not very high although the sample was representative and showed a trend. It also implied that Saudi girls at six years of age are far from the Oral Health goal of being 50% caries-free by the year 2000 as established by WHO and FDI.²⁴

This high prevalence of caries has significant health care implications. Further and larger studies should be undertaken in order to look into the reasons for the gap between the target and the present state; estimate the future needs for dental health services and facilitate planning for distribution of resources for dental care.

The present epidemiological study aimed at providing a baseline for future analysis of change in dental health and disease in Saudi school girls in general and Armed Forces schools in particular. It also showed the need for regular and coordinated surveys to assess changes in caries level and to take appropriate steps for prevention.

Acknowledgement

The authors extend their appreciation to Dr. Tahir Paul of the Riyadh Armed Forces Hospital for his help in the preparation of this paper.

References

1. Sgan-Cohen HD, Lipsky R and Behar R. Caries, diet, dental knowledge and socio-economic variables in a population 15-year-old Israeli school children. *Community Dent Oral Epidemiol* 1984;12:103-111.
2. Demers M, Brodeur J, Simard PL and Christian M. Caries predictor suitable for mass screening in children: a literature review. *Community Dent Health* 1990; 7:11-21.
3. Silverstone. *Dental Caries, etiology, pathology and prevention*. London, MacMillan 1981.
4. Evans RW, Beck DJ and Brown RH. Relationship between fluoridation and socio-economic status on dental caries experience in 5-year-old New Zealand children. *Community Dent Oral Epidemiol*; 12;5-9.
5. French AD, Carmichael CL, Furness JA and Rugg-Gunn AJ. The relationship between social class and dental health in 5-year old children in North and South of England. *Br Dent J*1984;156:83-86.
6. Carmichael CL, Rugg-Gunn AJ and Ferrel A.S. Relationship between fluoridation, social class and caries experience in 5-year-old children in Newcastle and Northumberland in 1987. *Br Dent J* 1989; 167:57-61.
7. Palmer JD and Pitter AFV. Difference in caries levels between 8-year olds in Bath, from different Socio-economic groups. *Community Dent Health* 1988;5(4):363-367.
8. Marketing analysis group. ACORN. A new approach to marketing analysis. (1983). C.A.C.I. Inc International, 59-62 High Holborn, London WC1N6DX.
9. McNulty JA and Fos PJ. The study of caries prevalence in children in a developing country. *J Dent Child* 1989;56(2):129-136.
10. Anwar S and Downer MC. Dental caries experience of school-going children in Lahore. *Pakistan Oral Dent J*1992; 12: 36-41.
11. Al-Khateeb TL, Darwish SK, Bastawi AE, and O'Mullane DM. Dental caries children residing in communities in Saudi Arabia with differing levels of natural fluorides in drinking water. *Community Dent Oral Epidemiol* 1990; 7,165-71.
12. Al-Mohammadi SM, Rugg-Gunn AJ and Butler TJ. Caries prevalence in boys aged 2-4 and 6 years according to socio-economic status in Riyadh, Saudi Arabia. *Community Dent Oral Epidemiol* 1997;25:184-6.
13. O'Sullivan DM and Tinanoff N. Social and biological factors contributing to caries of maxillary anterior teeth. *Paediatr Dent* 1993; 15(1): 41-44.
14. Murtomaa H, Al Za'abi F, Morris RE and Metsanitty M. Caries experience in a selected group of children in Kuwait. *Acta Odontol Scand* 1995; 53: 389-391.
15. World Health Organization, *Oral Health Surveys-Basic methods*. 3rd ed. Geneva: World Health Organization, 1987.

16. Al-Sekait MA and Al-Nassir AN. Dental caries prevalence in primary Saudi school children in Riyadh District. *Saudi Med J* 1988; 9:606-09.
17. Al-Shammery AR, Guile EE and Backly M. Prevalence of caries in primary school children in Saudi Arabia, *Community Dent Oral Epidemiol* 1990; 18(6):320-1.
18. Magbool G. Prevalence of Dental caries in school children in Al Khobar, Saudi Arabia. *J Dent Child* 1992;59(5):384-86.
19. Paul T and Maktabi A. Caries experience of 5-year-old children in Al-Kharj, Saudi Arabia. *Int J Paed Dent* 1997; 7; 43-4.
20. Al-Hosani E and 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; 31-6.
21. Al Mughery AS, Attwood D and Blinkhorn AS. Dental health of 5-year old children in Abu Dhabi, United Arab Emirates. *Community Dent Health* 1991;19:308-9.
22. Wyne A, Darwish S, Adenubi J and Khan N. Caries prevalence and pattern in Saudi pre-schoolers, Abstract No. 2739. *J Dent Res* 1996; 75.
23. Smythe SJ, Shulman ER and Patrissi G et al. Prevalence of dental caries in USAF family members age 3-15. *Paediatr Dent* 1990 May-Jun,-12:172-9.
24. FDI-WHO. Global goals for oral health in the year 2000. *Int Dent J* 1982; 32: 74-77.