SS El-Qaderi
D Quteish Ta'ani

Dental plaque, caries prevalence and gingival conditions of 14–15-year-old schoolchildren in Jerash District, Jordan

Authors' affiliations:
Saleh S. El-Qaderi, Department of Public Health and Family Medicine, Faculty of Medicine, Jordan University of Science and Technology, Irbid, Jordan
D. Quteish Ta'ani, Department of Preventive Dentistry, Faculty of Dentistry, Jordan University of Science and Technology, Irbid, Jordan

Correspondence to:
Dr Saleh El-Qaderi
Department of Public Health and Family Medicine
Faculty of Medicine
Jordan University of Science and Technology
PO Box 3030
Irbid 22110
Jordan
Tel.: +962 2 6352 352
Fax: +962 7095009
E-mail: sqaderi@just.edu.jo

Dates:
Accepted 24 February 2006

To cite this article:
Int J Dent Hygiene **4**, 2006; 150–153
El-Qaderi SS, Quteish Ta'ani D.
Dental plaque, caries prevalence and gingival conditions of 14–15-year-old schoolchildren in Jerash District, Jordan

Abstract: The aim of this cross-sectional study was to evaluate oral hygiene, gingival condition and dental caries prevalence in 14–15-year-old school children in Jerash District, Northern Jordan. Twenty schools (10 male and 10 female schools) with 1362 children of eighth and ninth grades were randomly selected and incorporated in this study. All participants had dental examinations for oral hygiene, gingival condition and dental caries experience using the Silness and Löe Plaque Index (PI), Löe and Silness Gingival Index (GI), and decayed (D), missing (M) and filled (F) teeth (DMFT) and surface (DMFS) codes respectively. The results showed that males had significant lower plaque but significantly higher gingival scores than females ($P < 0.001$). About 24% of children were caries-free. The proportions of children with one, two or three decayed teeth were between 10% and 18%. Slight non-significant variations between males and females were observed in regard to DMFT/S and their components ($P < 0.05$). It is concluded that significant gender variations were noted in PI and GI scores but not in DMFT/S or their components. However, the values of these clinical scores were lower than those results previously reported in northern Jordan.

Key words: dental caries; gingival status; Jordan; oral hygiene; Schoolchildren

Introduction

Only few studies have been published in the literature with regard to the prevalence and distribution of dental caries and

Table 1. **Means (M) and standard deviations (SD) of Plaque Index and Gingival Index scores among males and females of the study population (n = 1362)**

Variables	All subjects	Male	Female	*P*-value
Plaque Index (M ± SD)	1.46 ± 10.69	1.57 ± 10.73	1.73 ± 10.65	0.000
Gingival Index (M ± SD	1.56 ± 11.01	1.72 ± 11.17	1.44 ± 10.83	0.000

periodontal disease in Jordanian children and adolescents. None of these studies were related to Jerash District (1). All these previous studies were conducted in northern Jordan and have shown that dental caries experience, as measured by decayed, missing and filled teeth (DMFT) index, was found to be between 4.5 and 5 for the 13–16-year-old groups (2–4). These values are relatively high as compared with the declining DMFT values in most industrialized developed countries (5–9). Furthermore, assessment of the prevalence and severity of periodontal disease in 2039, 15- to 16-year-old Jordanian adolescents showed that gingival rather than periodontal disease is more common (3). Recently, the trends in oral hygiene, gingival condition and caries prevalence in 13–14-year-old northern Jordanian school children were studied (4). It was concluded that oral hygiene, gingival condition and dental caries had improved since 1993.

The aim of the present study was to evaluate oral hygiene, gingival condition and dental caries among school children in Jerash District, Jordan.

Materials and methods

The list of all public schools that included the eighth and ninth grades (14–15-year-olds) was obtained from the Department of Statistics and Planning at the General Directorate of Education in Jerash District. A total of 93 public schools (52 male and 41 female schools) formed the sampling frame. Of these 20 schools (10 male and 10 female schools) were randomly selected and incorporated in this cross-sectional study. Thus, 1362 school children were included in this study.

Prior to the survey, calibration of both examiners who participated in the study was undertaken by means of a pilot study including two schools (one for male and the other for female) and 72 children were examined during a 1-week period. The method of examination and scoring was standardized in the Periodontology Clinic, Faculty of Dentistry, Jordan University of Science and Technology until an interexaminer- and intra-examiner reliability of 88% was achieved.

The children were examined for oral hygiene status, gingival conditions and dental caries while seated on a chair beside the classroom's windows utilizing day light and room artificial light. Oral hygiene was evaluated by examining the dental plaque present on the inner and outer aspects of the six index teeth, using the criteria of the Plaque Index of Silness and Löe (10). Gingival condition was determined for the same teeth using the criteria of the Gingival Index of Löe and Silness (11).

Dental caries was diagnosed by visual examination using a probe and dental mirror utilizing the criteria recommended by the World Health Organization (12). Dental caries was documented using the tooth and surface description codes (DMFT and DMFS indices) for the entire dentition present. Missing anterior teeth were counted as four surfaces, and missing posterior teeth were counted as five surfaces.

Statistical analysis

Frequency distribution and other descriptive statistics including means and standard derivations were calculated for these indices. Differences in mean scores were tested using Student's *t*-test. *P*-values of ≤0.05 were regarded as statistically significant.

Results

The total number of participants in this study was 1362. Of these, 592 (43.5%) were males and 770 (56.5%) were females.

The results of the mean plaque and gingival scores for both males and females are given in Table 1. Results showed that males tended to have significantly lower Plaque Index but significantly higher gingival scores than females (*P*-value <0.000 for both scores).

The frequency distribution of decayed (DT), missing (MT) or filled teeth (FT) among the sample population is shown in

Table 2. **Frequency distribution of decayed (DT), missing (MT) or filled teeth (FT) among the study population (n = 1362)**

Number of decayed, missing or filled teeth	DT, *n* (%)	MT, *n* (%)	FT, *n* (%)
0	330 (24.2)	1121 (82.3)	1140 (83.7)
1	147 (10.8)	164 (12.0)	117 (8.6)
2	243 (17.8)	56 (4.1)	43 (3.2)
3	226 (16.6)	8 (0.6)	24 (1.8)
4	200 (14.7)	9 (0.79)	16 (1.2)
5	92 (6.8)	2 (0.1)	12 (0.9)
6	59 (4.3)	1 (0.1)	4 (0.3)
7	37 (2.7)	1 (0.1)	2 (0.1)
>8	28 (2.1)	1 (0.1)	4 (0.3)

Table 3. **Means and standard deviations of decayed (D), missing (M) and filled (F) teeth (DMFT) and surfaces (DMFS) of both sexes of the sample population ($n = 1362$)**

	Teeth				Surfaces			
Sex	D	M	F	DMFT	D	M	F	DMFS
Male	2.55	0.26	0.18	2.99 ± 2.49*	3.08	1.27	0.24	4.59 ± 5.01†
Female	2.49	0.27	0.48	3.23 ± 2.40*	2.97	1.28	0.61	4.86 ± 4.59†
Total	2.51 ± 2.11	0.27 ± 0.71	0.35 ± 1.06	3.13 ± 2.45	3.02 ± 2.64	1.28 ± 3.37	0.45 ± 1.34	4.74 ± 4.78

*t-test (not significant, $P = 0.072$).
†t-test (not significant, $P = 0.31$).

Table 2. About 24% of the sample population were caries-free. However, approximately 16–18% of these school children had either MT or FT. The proportion of school children with one or two decayed teeth was between 10% and 17%, while that with three decayed teeth was 16.6%. These proportions decrease gradually with increased number of decayed teeth (Table 2).

The caries data found by the clinical examination of the surveyed school children are presented in Table 3. Slight non-significant variations were observed in the D-component and DMFT and DMFS of boys compared to girls. DMFT/S scores were slightly higher among females than among males but the difference was not statistically significant ($P = 0.072$ and 0.31 for DMFT and DMFS respectively). However, the M-components of teeth and surfaces were similar in males and females, while the F-components were higher, with no statistical significance, in females than males for both teeth and surfaces.

Discussion

Only few studies have described the oral hygiene, gingival status and dental caries in Jordanian children (1–4, 13); none of these studies were related to children living in Jerash District.

In earlier studies in 13–14-year-old northern Jordanian children it was reported that Plaque Index scores were 1.82 and 1.63 during 1993 and 1999 respectively (4). These plaque scores were higher than that reported in this study (1.46). Furthermore, gingival scores reported in these school children in 1993 and 1999 were 1.89 and 1.67 respectively, which are once again higher than gingival scores observed in this study (1.56).

The gender differences found among school children with regard to plaque and gingival scores may be related to the pattern of personal oral hygiene, hormonal changes occurring during puberty and grooming effect at this age. However, there is an obvious relation in the present study between dental plaque and gingivitis, and that is consistent with the general view in the literature that gingivitis is related to the presence of plaque deposits. About one-quarter of schoolchildren were caries-free while 16–8% of them had missing or filled teeth with a DMFT of 3.13 ± 2.45 (Table 3).

Previous studies (2, 3) have shown that the DMFT scores in 13–15-year-old school children was between 4 and 5. More recent study revealed a lower DMFT scores (3.26) among 12–15-year-old northern Jordanian school children (4). Thus, the present study showed a slightly lower DMFT scores among school children in Jerash District. Such tendency for fewer (lower) caries experience might be due to improved oral hygiene habits and widespread use of fluoridated toothpaste. Nonetheless, both gingivitis and dental caries in these school children were still high compared to that found in developed countries (14).

In many developing countries, the prevalence of dental caries and periodontal disease are increasing, thereby constituting a public health problem (15). To control such diseases, good oral and dental health should be achieved at both public and personal levels. The development of public health policies, which include comprehensive oral health promotion programme at the national and community levels is essential. At the same time, the participation of individual subjects in developing personal skills in relation to oral hygiene practices and to improve diet and nutrition is crucial.

In conclusion, the results of this study showed that males had significantly higher plaque and gingival scores than females with no significant variations in DMFT scores. However, all these scores were lower than those reported in previous studies related to Jordanian school children.

References

1 Quteish Taani D. The periodontal status of Jordanian adolescents measured by CPITN. *Int Dent J* 1995; **45:** 382–385.
2 Quteish Taani D. Dental health of 13–14 years-old Jordanian school children and its relationship to socioeconomic status. *Int J Paediatr Dent* 1996; **6:** 183–186.
3 Quteish Taani D. Caries prevalence and periodontal treatment needs in public and private school pupils in Jordan. *Int Dent J* 1997; **47:** 100–104.

4 Quteish Taani D. Trends in oral hygiene, gingival status and dental caries experience in 13–14-year-old Jordanian school children between 1993 and 1999. *Int Dent J* 2001; **51:** 277–281.
5 Heloe LA, Haugejorden O. The rise and fall of dental caries: some global aspects of dental caries epidemiology. *Community Dent Oral Epidemiol* 1981; **9:** 244–299.
6 Glass RL. First international conference on the declining prevalence of dental caries. *J Dent Res* 1982; **6:** 1301–1388.
7 Leverett DH. Fluoride and the changing prevalence of dental caries. *Science* 1982; **217:** 26–30.
8 Mandell ID. Changing patterns of dental caries. *Quintessence Int* 1985; **1:** 81–87.
9 Cahen PM, Obry Musset AM, Grange D, Frank RM. Caries prevalence in 6–15 years–old French children based on the 1987 and 1991 national Surveys. *J Dent Res* 1993; **72:** 1581–1587.
10 Silness J, Loe H. Periodontal disease in pregnancy. II. Correlation between oral hygiene and periodontal condition. *Acta Odontol Scand* 1964; **22:** 121–135.
11 Loe H, Silness J. Periodontal disease in pregnancy. Prevalence and severity. *Acta Odontol Scand* 1963; **21:** 533–551.
12 World Health Organization. *Oral Health Survey, Basic Methods*, 3rd edn. Geneva: WHO, 1987.
13 Taani D. Relationship of socioeconomic background to oral hygiene, gingival status, and dental caries in children. *Quintessence Int* 2002; **33:** 195–198.
14 Marthaler TM, O'Mullane D, Vrbic G. Caries status in Europe and predictions of future trends. *Caries Res* 1990; **24:** 381–396.
15 Sheiham A. Changing trends in dental caries. *Int J Epidemiol* 1984; **13:** 142–147.