

Prevalence of Dental Caries, Gingival Health and Oral Hygiene of 11-12 Years Old Rural Bedouin* School Children in Jordan

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Abstract Objective: This paper provides an assessment of children's oral health status amongst the Bedouin in Al- Mafraq Governorate of Jordan. **Methods:** An assessment of dental caries, gingival health and oral hygiene of 107 girls and boys students aged 11-12 years was conducted using decayed, missing, filled teeth (DMFT) and community periodontal (CPI) Indices according to the WHO diagnostic criteria and clinical methodology. **Results:** it was found that a high proportion of carious lesions were untreated' the mean DMFT was (3.60±39). The prevalence of gingival bleeding was high - over 80% of children were affected by a poor level of oral hygiene. **Conclusion:** The study outcome on the oral health status acknowledges the necessity of preventive measures to improve the dental health of Bedouin school children in rural settings.

Keywords: Bedouin (*a member of people living in or near the desert), Oral health status

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1. Introduction

A cumulative body of research has recognised that children living in scattered remote areas experience a great burden of untreated dental conditions and inadequate dental care.

Interrelated socio-demographic barriers such as geographical seclusion, poverty, cultural influences and lack of preventive dental schemes have resulted in higher incidences of oral diseases [1,2].

The literature showed contrasting results when reporting on dental caries prevalence among rural children, the mean number of decayed teeth, and the missing and filled teeth (DMF) index varied considerably from very low in Ghana [3] to moderately high when measured among other countries such as Tanzanian and Iranian [4,5]. However, and most importantly, the majority of outcomes showed a high mean of decayed component (D) of the DMFT [6,7]. Studies carried out on children and young people in rural areas of Jordan and some Mediterranean countries such as Syria, Libya and Tunisia all showed similar results. Dental decay was relatively frequent with a sizeable number of untreated cases, poor oral hygiene and higher incidence of gingival diseases [8,9,10,11].

Over the past fifty years Bedouins across of the Middle East have begun a transitional phase to settle in small villages and encampments. Traditionally, they live in arid

and semi arid areas and their livelihoods are based mainly on wage labour, agriculture and herding.

There have been relatively few studies on the trend of oral health among the Bedouin, however Wyne [12] reported on the pattern of caries, oral hygiene and orthodontic status of Bedouin children in Saudi Arabia. The results showed that caries rate was low, both in terms of prevalence and severity. In 2007, a study of early childhood caries among a Bedouin community residing in the eastern outskirts of Jerusalem showed that more than 20% of children had active dental decay [13].

In Jordan, epidemiological data on Jordanian Bedouin is very scarce, hence the present study aimed to describe the epidemiological profile of dental caries, gingival health and oral hygiene among a group of 11-12 year old children from Bedouin villages and encampments in the north eastern Badia of Jordan.

2. Setting and Methods

Permission from the Bedouin rural health project was obtained from both the primary health care directorate of the Ministry of Health in Jordan, which provided access to the comprehensive health centres of North-Eastern Badia, and the Ministry of Education, which enabled us to have access to boys' and girls' schools in the region. Informed consent was requested from schools via the principals and parental consent was obtained prior to the children's participation through children taking letters home.

The school-based oral health assessment took place in Al-Mafraq Governorate, a remote rural area, in two primary schools, (one for boys and one for girls) serving Bedouin villages in the area.

Oral examinations of 53 girls and 54 boys' school children aged 11-12 years was carried out at the respective schools within a classroom. Each child was seated on a portable chair and examined under natural light. The clinical examination was performed by one examiner using mouth mirrors, standard dental and periodontal props. The diagnostic criteria selected for the assessment of dental decay used followed the 1987 WHO oral health surveys basic Methods [14].

Oral hygiene status was recorded to indicate the presence or absence of visible soft dental plaque for each of the six sextants in the mouth. The community periodontal index (CPI) was performed for the assessment of periodontal health. Three indicators were used: healthy (code 0); bleeding (code 1); and calculus (code 2). The

statistical package for social science (SPSS) version 16 was used to produce descriptive statistics. Statistical analyses were carried out using Chi- χ^2 -test.

3. Results

Table 1 demonstrates the dental caries trends among the study group. Only 12% of the children were completely free of dental caries (9.3% boys and 2.8% girls).

The mean decayed teeth, missing and filled teeth (DMFT) of the total sample were 3.60 ± 2.30 . The decay (D) component value was (3.15 ± 2.18) and formed the main element of the DMFT index, while the mean of both missing (M) and filled (F) teeth was insignificant. A statistically significant ($P < 0.01$) gender variation was reported; boys experienced a higher mean DMFT and Decay (D) component value (4.39 ± 2.48 , 3.87 ± 2.18) than the girls (2.79 ± 2.03 , 2.42 ± 1.94).

Table 1. Caries experience of 11-12 years old Bedouin school children by gender

	Male			Female			P value	Total		
	N	Mean	SD	N	Mean	SD		N	Mean	SD
Decay (DT)	209	3.87	2.181	128	2.42	1.946	$p < .01$	337	3.15	2.184
Missing (MT)	18	.33	.752	6	.11	.375	$p > .05$	24	.22	.604
Filled (FT)	10	.19	.479	14	.26	.763	$p > .05$	24	.22	.634
DMFT	237	4.39	2.483	148	2.79	2.032	$p < .01$	385	3.60	2.398

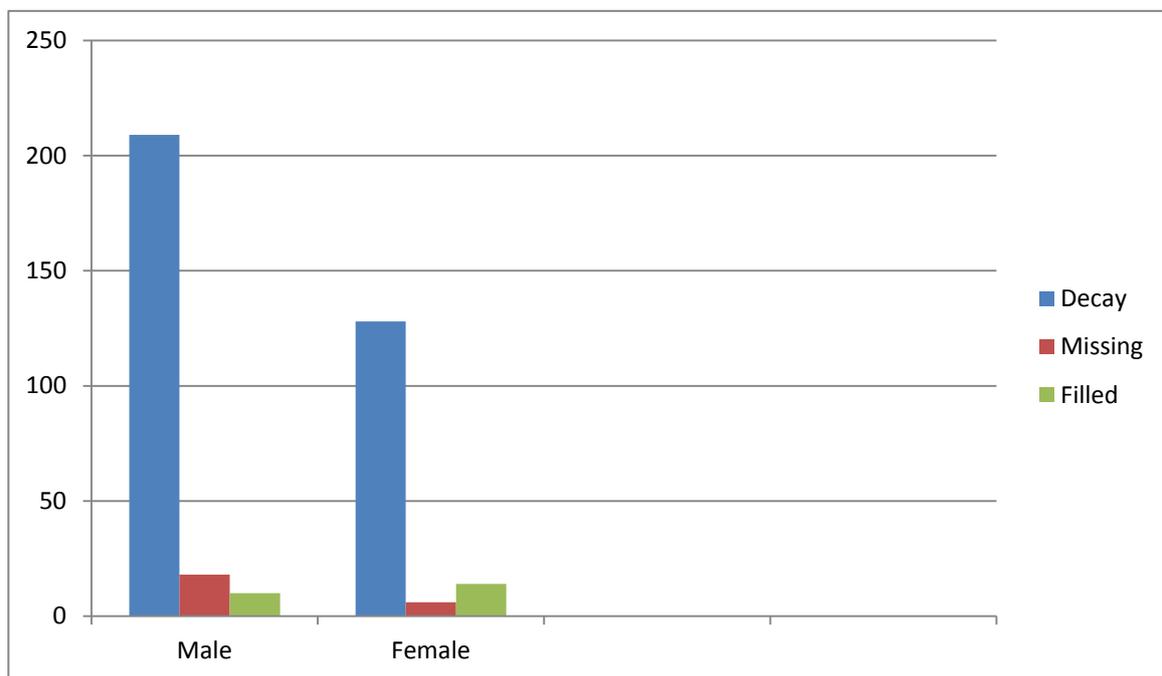


Figure 1

In the recorded gingival health scoring, more than two thirds of the children (70.1%) presented with noticeable gingival bleeding (code 1), compared to one fifth (19.6%) with healthy gingivae (code 0). The means sextants of gingival bleeding in all children (2.9) were more than that of calculus (code 1). The Chi- χ^2 -test revealed that the two means were statistically different ($P < 0.01$).

Furthermore, females were less affected by gingival bleeding (31.8%) than males (38.3%). The mean number of sextants for gingival bleeding for boys was 3.5 and significantly greater than that for girls (2.6). A very small percentage of children were presented with visible calculus (10.3%) and the mean of sextants with calculus in girls (0.07) was notably lower than that for boys (0.13) ($P < 0.01$).

Table 2. Prevalence & Severity of periodontal Health of 11-12 Bedouin children by gender

Sex		Community periodontal index			Mean No. of Sextants/ child according to CPI		
		Healthy Code 0	Bleeding Code 1	Calculus Code 2	Healthy	Bleeding	Calculus
Female	Count	15	34	4	3.5	2.6	0.07
	% of Total	14.0%	31.8%	3.7%			
Male	Count	6	41	7	2.4	3.5	0.13
	% of Total	5.6%	38.3%	6.5%			
Total	Count	21	75	11	2.9	3.1	0.1
	% of Total	19.6%	70.1%	10.3%			

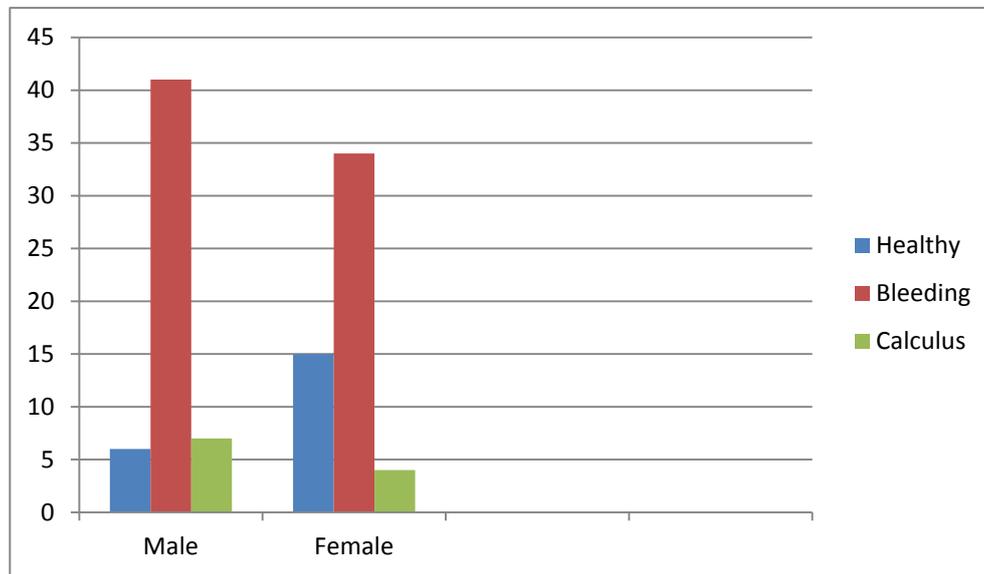


Figure 2

Table 3 shows that the frequency distribution of the presence and absence of visible plaque accumulation; 87.9% of the children had visible soft debris, a mean of four sextants per child were affected. There was a

significant difference in oral hygiene between girls and boys; the boys had poorer oral health condition (46.7%) with mean sextants of 4.3, compared to 41.1% with 3.1 mean number of sextants for girls.

Table 3. Oral Hygiene Status of 11-12 Years Old Bedouin Children by Gender

Sex		Dental Plaque		Mean No. of Sextants /child
		No Visible Plaque	With Visible Plaque	
Female	Count	9	44	3.1
	% of Total	8.4%	41.1%	
Male	Count	4	50	4.3
	% of Total	3.7%	46.7%	
Total	Count	13	94	3.7
	% of Total	12.1%	87.9%	

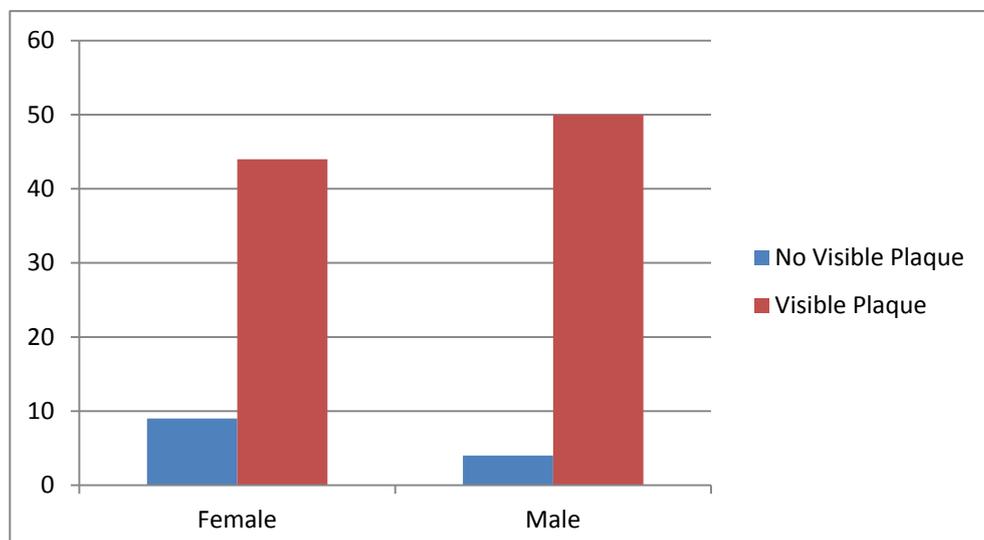


Figure 3

4. Discussion

The results obtained show a high level of dental caries among the study group; more than 80% were affected, which agreed with the caries rate reported by other studies conducted on rural school children of some regional and developing countries such as in UAE and India. [15,16].

The restorative component (F) formed less than 13%, while the decayed (D) formed the highest proportion of the DMFT index, as has been shown to be the case in other studies [7,17]. It also marked a significant change in the pattern of eating habits of the Bedouin. A great number of reports have revealed a strong and positive association between high sugar intake, change in lifestyle and a significant increase in dental caries, especially among immigrants and new settlers [18,19]. The intensity of dental decay among the Bedouin children can be ascribed to their settlement near the neighbouring areas of urban cities and the influx of confectionary in terms of quantity and variety, both at school and home [20,21].

A comparison of the mean DMFT among boys and girls showed a statistically significant difference ($P < 0.01$) between the two. According to cultural attitudes, and specifically in rural communities, boys seem to enjoy more social freedom and less restriction of their movements so they are more likely to purchase confectionaries and fizzy drinks at the local shops than their girls, as they are sent to do errands which makes them more susceptible to high levels of caries [22].

Furthermore, the mean caries observed DMFT (3.6 ± 4.1) was comparable to schoolchildren from Jordanian urban areas which were reported as 3.3 ± 4.17 [7]. The results confirm the view that Bedouin children coming from low income families are shown to have a caries rate very similar to urban children from higher income households. The outcomes were in agreement with Taani and Mej [18,23] who found no major differences in DMFT scores between children from families with different socio-economic spectrum.

It appears that the similarities in dental caries scores demonstrate no major difference in dental caries between Bedouin and Non-Bedouin School children and this clearly reflects the increased consumption of processed carbohydrates and sugar between both groups [24].

Throughout Jordan, there is an ease of access to markets and small shops selling not only fruit and vegetables but also sweets, biscuits and carbonated drinks which are sold near schools at breaktimes.

Moreover, in Jordan, school-based oral health promotion programs have not been widely established. There are short oral health education sessions carried out when dentists visit schools for annual screening examinations, which seem to have a limited impact on children's behaviours [25].

Gingival bleeding and the factor leading to it (soft plaque) were widespread; this was the most persistent observation among the study group. Healthy gingival was found in only 19.6% of the total sample; this concurs with the findings of other investigators [26,27].

The mean sextants score per child for the total sample as ranged from simple to intense gingivitis, with no indication of destructive diseases. Unilateral function was observed among some children due to untreated painful

decayed teeth giving rise to many cases of severe gingivitis and poor oral hygiene.

Concerning the soft deposits, the present study revealed poor oral hygiene; three out of six sextants were affected, which suggests that only a few of the children perform efficient oral health practices. Dental calculus was reported in 10.3% of the Bedouin children with significant differences detected between genders, as the mean number of sextants in boys was double that amongst the girls.

Gender difference was statistically significant with boys having a poorer level of oral hygiene and gingival health. Some researchers attribute this variation to the fact that girls are more aware and motivated concerning their personal hygiene and they start cleaning their teeth more conscientiously, more than likely to aesthetic reasons. Conversely, boys in this age group seem to oppose the acceptance of maintaining oral hygiene related attitudes [28].

The results also substantiate the association of income-related inequality and its effect on the level of gingival diseases and oral health. Socio-economic situation was shown to have a strong influence on oral hygiene practices [29]. Parents from low social low classes tend to lack information on what is appropriate and adequate to support the oral hygiene practice of their offspring [30]; added to this is the un-affordability of acquiring means most of the time.

Despite the major impact of urbanization on the Bedouin dietary habits, a number of factors emerge to explain the poor dental health among children.

Firstly, the nature of continuous movement of Bedouin tribes and financial constraints preventing access to private dental health care within the community. Bedouin do not prioritise oral health and only seek dental treatment when pain arises.

Secondly, failure of the adoption of healthy diet guidance to provide healthier choices within the school environment. Finally, ineffective school oral health promotion programs with unavailability of systemic fluoride.

5. Conclusion

On the basis of the findings, the majority of Bedouin children needed dental attention and dental health education for practicing proper oral hygiene. A multi-level and inter-disciplinary approach for oral health promotion that is based within schools, clinics and the home, needs to be explored if a significant transformation in individual behaviour is to be achieved. There is a need to develop preventive school-based oral health programmes, as well as activities to improve parental knowledge on the importance of oral hygiene practices.

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