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Periodontal treatment need of the 6th-grade Jordanian pupils

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Summary. *Aim.* The purpose of this study was to assess the periodontal treatment needs of 6th-grade Jordanian pupils aged 12 years old.

Methods. Forty-eight classes teaching 6th-grade pupils were randomly selected from the six education zones in Irbid region, Jordan. The data were collected during interviews and clinical examinations using the Community Periodontal Index of Treatment Needs (CPITN) criteria.

Results. The findings revealed that 27·5% of the examined pupils had healthy periodontium, 22·9% showed gingival bleeding on probing but no calculus, and 31·4% had calculus deposits. Pockets in the 4–5 mm range were found in 17·6% and those in the > 6 mm range in 0·6% of the pupils. Healthy periodontium was found in 2·9 sextants, whereas 2·7 sextants showed gingival bleeding and calculus. Periodontal pockets were demonstrated in less than 0·4 sextants. Periodontal therapy was not required for 27·5% of the pupils. The rest of the pupils (72·5%), however, needed oral hygiene improvement, and of these 50% required professional calculus removal.

Conclusion. This study indicated that about 73% of the sample needed oral hygiene instructions and motivation, 50% needed professional scaling, and 0·6% needed periodontal therapy. The data of this study establish a baseline data, which may help in planning dental services and initiating further research.

Introduction

Periodontal diseases are among the most common frequent diseases affecting children and adolescents [1]. Early diagnosis and treatment of periodontal diseases in children and adolescents are very important, because incipient periodontal diseases in children may develop to advanced periodontal diseases in adults and because prevention and treatment of periodontal disease are simple and very effective [1].

The classification systems of periodontal disease have changed periodically over time. The Consensus Report of the 1989 World Workshop in Clinical Periodontics [2] classified periodontal disease into adult periodontitis, early onset periodontitis, periodontitis associated with systemic disease, necrotizing ulcerative periodontitis, and refractory periodontitis. In 1994, the First European Workshop on Periodontology [3] simplified the 1989 classification of periodontal disease into three categories (early onset, adult, and necrotizing periodontitis). In 1999, a new classification of periodontal diseases was presented at the International Workshop on Periodontics [4]. In this classification, periodontal disease is classified into gingival diseases, chronic periodontitis, aggressive periodontitis, periodontitis as a manifestation of systemic diseases, necrotizing periodontal diseases, abscesses of the periodontium, periodontitis associated with endodontic lesions, and developmental or acquired deformities and conditions.

Periodontal health status and treatment needs are important issues for every developing and industrialized society worldwide. Descriptive studies are required to collect baseline data to increase the public awareness of the extent and severity of the periodontal disease. The data can also lay the foundation for promoting periodontal health, and consequently improving the quality of oral health and life through the organized efforts of the society.

The community periodontal index of treatment needs (CPITN) was introduced in 1978 as an epidemiological

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Table 1. Details of the studies that used WHO CPITN in the 12-year-old children.

Authors	Country	No.	Age	Healthy	Bleeding	Calculus	4–5 mm pockets	> 6 mm pockets
Riordan *et al*. [12]	Australia, west	100	12	28	20	52	0	0
Hargreaves *et al*. [13]	Canada	3117	13	42·5	53·3	4·3	0·2	0·03
Vignarajah [14]	Caribbean Island	246	12	26	28	48	0	0
Orozco *et al*. [15]	Colombia	116		0·9	18·1	51·7	18·1	11·2
Plancak & Aurer-Kozelj [16]	Croatia	280	12	3·2	57·3	31·7	7·8	0
Gracia-Godoy *et al*. [17]	Dominican Republic	51	12–13	4–14	2–10	66–73	6–8	0
Nordblad *et al*. [18]	Finland	100	12	2	74	23	1	0
Peterson & Razanamihaja [19]	Madagascar	1992	12	3·2	9	87·8	0	0
Haiket *et al*. [20]	Morocco	238	7–15	0	68·9	31·1	0	0
Smith & Lang [21]	Nicaragua	15	12–17	0	0	33·3	60	6·7
Peterson [22]	Niger	400	12	0	0	99·8	0·3	0
Guile *et al*. [23]	Saudi Arabia	2321	12	32	52	16	0	0
Mumghamba *et al*. [24]	Tanzania	142	10–14	4·2	15·5	80·3	0	0
Songpaisan & Davies [25]	Thailand	58	12	4·1	6·1	89·6	0·2	0
Mengel *et al*. [26]	Yemen	248	12–14	10·5	16·9	63·3	8·9	0·4
This study	Jordan	1388	12	27·5	22·9	31·4	17·6	0·6

tool for screening gingival and periodontal diseases [5]. It is a well-tried, time-saving, and simple procedure, which can be used in large epidemiological studies and routine dental practice [6,7].

Several studies on the assessment of prevalence and treatment needs of periodontal diseases have been reported for different populations (Table 1). Their results indicated dissimilarities and rapid changes in the pattern of periodontal disease across the world [8].

In Jordan, no epidemiological studies were reported on periodontal status and treatment needs of 12-year-old school pupils. A noteworthy attempt was made to address the severity of periodontal disease in adolescents [9].

The aim of the study was to obtain detailed information on the periodontal treatment needs of 6th-grade pupils aged 12 years and provide baseline data, which may help in future planning of the dental services and initiate further research.

Methods

Irbid education region, Irbid, Jordan, was chosen to embrace this study. This region is divided into six education zones according to their geographical locations. An official permission and a list of all schools teaching 6th-grade pupils were obtained from the Education Directorate. The sample frame consisted of 288 classes distributed throughout the education region. Four classes for boys and the same for girls were randomly selected from each education zone, producing a total number of 48 classes. An official letter was sent to the principal of each school of the selected classes, and then they were contacted by telephone to arrange a time for dental examination. The pupils were informed about the time of examination by their teachers, and consents were requested from their guardians. The pupils in the selected classes were briefed about the purposes and the procedures of this research and were invited to participate in the dental examination. Pupils who refused participation and those who were absent at the day of examination were tracked, and their proportions were assessed. This study was approved by the Jordan University of Science and Technology (JUST) ethics committee through the Deanship of Scientific Research at JUST.

Oral examinations were conducted using a mouth mirror, a dental explorer, and a CPITN periodontal probe under concentrated artificial light. Participants were examined in their classrooms sitting on conventional chairs with back and head support. No radiographs were taken; the teeth were not dried and calculus was not removed. The periodontal assessments were carried out according to the World Health Organization (WHO) criteria for the CPITN [10].

Only one tooth with highest CPITN scores was recorded for each sextant. The data were recorded into five categories according to CPITN scores as follows: score 0 = healthy; score 1 = bleeding on gentle probing; score 2 = calculus; score 3 = shallow pockets of 4 or 5 mm, and score 4 = deep pockets

Table 2. Number and percentage of pupils (extent) among different CPITN scores by gender.

Periodontal condition		Male		Female		Total	
Score	Condition	No.	%	No.	%	No.	%
0	Healthy	86	16·1	296	34·7	382	27·5
1	Bleeding	176	33·0	142	16·6	318	22·9
2	Calculus	172	32·2	264	30·9	436	31·4
3	Pocket 4–5 mm	96	18·0	148	17·3	244	17·6
4	Pocket 6 mm or more	4	0·7	4	0·5	8	0·6

of 6 mm or more. The pupils then were categorized into one of four treatment groups linked to the CPITN index [6] on the basis of the most severe condition found. The four treatment categories were as follows: TN 0 = no treatment is required, TN 1 = improved personal oral hygiene is required, TN 2 = professional scaling is required, and TN 3 = complex periodontal treatment is required.

Calibration of both examiners was undertaken in dental clinics of JUST. A pilot sample involving 50 subjects were examined by both examiners during a period of 2 weeks prior to the investigation, Another 50 subjects were examined midway through examination. Intraclass correlation coefficient for overall CPITN scores was 0·95 prior to the examination, and 0·97 midway through the examination.

The data were processed according to the WHO recommendation [11] and analysed using the SPSS 9·0 program.

Results

Of the 48 classes examined, an initial sample was 1433 pupils. The number of pupils who dropped out from classes (absent) was 29 (22 boys and 7 girls) with a range of one to three pupils in each class. A total number of 1404 pupils were available for dental examination. Of those, 16 pupils (10 boys and 6 girls) refused the examination. A final sample of 1388 pupils were examined, of which 534 (38·5%) were males and 854 (61·5%) were females. Their mean age was 12·35 years with a range between 11 and 14 years.

The extent of periodontal condition of the pupils using CPITN scores by gender is presented in Table 2. The data showed that 27·5% of the pupils had healthy periodontium with no bleeding (score 0), 22·9% showed gingival bleeding on probing but no calculus (score 1), and 31·4% had calculus. The pockets of the 4–5 mm in depth (score 3) were present in 244 (17·6%) pupils, whereas those exhibited deep pockets with more than with 6 mm in depth (score 4) were only 8 (0·6%) pupils. No overlapping between two or more categories was recorded.

Table 3. The mean number of affected sextant (severity) among different CPITN scores by gender.

Periodontal condition				
Score	Condition	Male	Female	Total
0	Healthy	1·9	3·5	2·9
1	Bleeding	2·5	0·9	1·6
2	Calculus	1·2	1·2	1·2
3	Pocket 4–5 mm	0·3	0·4	0·4
4	Pocket 6 mm or more	< 0·01	< 0·01	0·01

Table 4. Distribution of pupils by CPITN treatment needs categories*.

Code	Description	Male	Female	Total
0	No treatment	16·1%	34·7%	27·5%
I	Improved oral hygiene	83·9%	65·3%	72·5%
II	Scaling	50·9%	48·7%	49·6%
III	Complex treatment	0·7%	0·5%	0·6%

*Treatment need categories were based on CPITN categorization [6].

Table 3 shows the severity of periodontal condition by displaying the mean number of affected sextants with periodontal conditions by gender. An average of 2·9 of the examined sextants per person were healthy, whereas 2·7 sextants were affected with bleeding and calculus without periodontitis. Periodontal pockets were found in less than 0·38 sextants.

The distribution of the pupils, according to their periodontal treatment need categories (codes 0, I, II, and III) CPITN coding system is detailed in Table 4. It is apparent that 27·5% of the pupils required no periodontal treatment and 72·5% (22·9% with bleeding, 31·4% with calculus, 17·6% with shallow pockets, 0·6% with deep pockets) needed to improve their oral hygiene (code I). Approximately 50% of the pupils needed professional scaling (code II). Complex periodontal treatment (code III), however, was needed by only 0·6% of pupils. Boys demonstrated

more needs to improve their oral hygiene (code I) than girls (84% *vs* 73%).

Discussion

Approximately one-fourth of Jordanian pupils reside in Irbid governorate. A cluster random sample of 6th-grade pupils was drawn from the schools list, which comprises approximately 17% of classes. Thus, a representative sample of Jordanian school children was achieved.

Due to variations in the number of the 6th-grade pupils from one school to another and from one classroom to another, a cluster random sample considering each classroom as a sampling unit was used. Despite selecting equal number of classes for boys and classes for girls in attempt to select equal number boys and girls in our study sample, unexpectedly 61% of the sample was girls. The difference between the numbers of girls and the numbers of boys assessed was mainly because of having higher number of females in each classroom for girls examined compared to classrooms for boys. Additionally, more boys declined participation in our dental examination (32 boys *vs* 13 girls). Data analysis of this study, however, was described for both boys and girls separately.

The studies, which have employed the WHO CPITN system for examining periodontal health status in 6th-grade subjects, are presented in Table 1 [12–26]. The table sorted the results of the studies according to the country in which they were conducted. Great variations in the results of periodontal condition in different geographical location are evident, which could be attributed to regional differences, eating and drinking habits, and different attitudes towards dental health.

Nearly 28% and 23% of Jordanian pupils showed healthy periodontium (score 0) and gingival bleeding (score 1), respectively. Comparing these proportions combined (nearly healthy periodontium) for Jordanian pupils with others from other nations, indicates higher proportion of healthy periodontium in more industrialized and developed countries [13,14,16,18,20] compared to those from still developing counties [15,21,22,24,26]. Similarly, the presence of calculus was noticed in about 31% of Jordanian pupils. Jordanian pupils demonstrated higher percentage of calculus than those from more developed countries (Canada, Finland) [13,18] and lower calculus rate than those from some African nations [19,22] and those of less growth (Yemen) [24]. The difference in periodontal conditions could be explained by differences in diet, oral hygiene practices, and differences in the access to health care among people from developing and developed countries. Shallow and deep pockets were higher in Jordanian pupils compared with those from Colombia, Nicaragua, and Yemen [15,21,26]. This indicates susceptibility of higher proportion of pupils to periodontal disease associated with difficulties in accessing professional periodontal therapy.

The results of this study signal the great need for preventive program targeting school children aged 12–13 years, with special emphasis on oral hygiene. This program should include educational component of how to perform proper brushing and flossing techniques, as well as promotional component on how to motivate oral health through organized effort at school level.

On the other hand, professional scaling was needed by about 50% of the school children. The numbers of sextants which needed professional cleaning in this group of pupils totalled 2180 sextants (1646 sextants with calculus, 526 sextants with shallow pockets, and 8 sextants with deep pockets). This means, on average, that each pupil needed professional scaling of 1·57 sextants. From dental personnel prospective, if a professional personnel can provide scaling of about 18 sextants per hour, a calculated 48 240 sextants can be treated by each professional annually. In Jordan, there are 1 463 484 school children in all classes. This means, if the pupils need to be met, there should be 48 additional professional (hygienist) to just provide scaling.

What this paper adds

- This paper indicated that about 73% of Jordanian pupil needed oral hygiene instructions and motivation, 50% needed professional scaling, and 0.6% needed periodontal therapy.
- The results of this study establish baseline data, which could help in planning and evaluating oral health programs.
- If the pupils' gingival health need to be met, there should be 48 additional professional (hygienist) to just provide scaling.

Why this paper is important for paediatric dentists

- The results of this study signals that pediatric dentist should put more effort in preventive program targeting schoolchildren ages 12–13 years, with special emphasis on oral hygiene.
- It is recommended that dental health services should be more directed towards motivating pupils towards oral hygiene and providing them with oral hygiene instructions.

The results of this study establish baseline data, which could help in planning and evaluating oral health programs. It is recommended that dental health services should be more directed at motivating pupils towards oral hygiene and providing them with oral hygiene instructions. Regular dental screening should be performed on regular basis in order to evaluate these programs and to refer pupils with unhealthy periodontium for periodontal treatment.

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