

Plaque, gingival condition and brushing behaviour among school children aged (11) and (12) years in Qadha Sinjar, Ninevah, Iraq

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ABSTRACT

The aim of the study was to estimate the prevalence and severity of gingivitis and oral hygiene condition in school children aged (11) and (12) years in peri-urban area (Qadha Sinjar).

A sample of (388) school children aged (11) and (12) years (184 boys and 204 girls) were examined using plaque index score by Silness and Løe, and gingival index by Løe and Silness. The severity of gingival inflammation and the frequency of tooth brushing were recorded. The results show that the mean plaque score for the total sample was (1.06); the girls reported less significant mean plaque score than boys. The mean gingival score was (1.45) for the total sample; also the girls reported less significant mean gingival score than boys. Three quarters of children have moderate gingivitis.

The study revealed that (63.7%) of the total sample did not brush their teeth or brush infrequently. Therefore, oral health education for school children is an essential activity for promoting, establishing and maintaining optimal oral health and preventing oral diseases.

Key Words: Brushing behaviour, oral hygiene, oral diseases.

الخلاصة

إن الهدف من هذه الدراسة هو لمعرفة نظافة الفم ومدى الإصابة بالتهاب اللثة وشدها لطلاب المدارس بعمر (11) و (12) سنة في قضاء سنجار. جرت الدراسة على عينة مكونة من (388) من طلاب المدارس بعمر (11) و (12) سنة (184) طالب و (204) طالبة) تم فحصهم باستعمال دليل اللويحات الجرثومية ودليل التهاب اللثة بالإضافة إلى قياس شدة التهاب اللثة وكذلك معرفة عدد مرات تنظيف الأسنان لكل طالب. تبين من النتائج أن معدل اللويحات الجرثومية كان (1,06) لمجموعة العينة وأن المعدل عند الطالبات أقل من الطلاب بدلالة إحصائية. أما معدل التهاب اللثة فكان (1,45) لمجموعة العينة وكذلك كان المعدل للطالبات أقل من الطلاب بدلالة إحصائية. وكان لثلاثة أرباع العينة التهاب لثة من النوع المتوسط.

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ومن خلال النتائج ظهر أن (٦٣,٧%) من مجموعة العينة لا ينظفون أسنانهم أو ينظفونها أحياناً. ولذلك يعتبر التنظيف الصحي الفموي لطلاب المدارس من الخطوات الفعالة للمحافظة على صحة الفم والوقاية من أمراض الفم والأسنان.

INTRODUCTION

Dental caries and periodontal disease have been accepted as the most widespread diseases of mankind⁽¹⁻⁴⁾, and both diseases described to be plaque related diseases^(5,6).

As it is generally agreed that oral hygiene is the most important factor for the health of periodontal tissue, the most appropriate oral hygiene habit is by their regular and proper technique of tooth brushing and use other aids^(7,8).

Periodontal disease usually begins at childhood as gingivitis and increases in prevalence and severity to the early "teen" years, and it may lead to the development of periodontitis which associated with pocket formation and bone resorption in adult population^(6,9).

The prevalence of periodontal disease in developing countries is high⁽¹⁰⁻¹²⁾ including Iraqi population^(13,14) and appears at an early age^(15,16).

In Iraq, many studies reported the prevalence of periodontal disease in urban areas (capital and other Governorates)⁽¹⁷⁻¹⁹⁾ and in rural areas (villages)⁽¹³⁻¹⁶⁾, but studies devoted to identify the oral health problem in large towns (Qadha, peri-urban) have been quite few⁽²⁰⁾.

So, the purpose of this study was to estimate the prevalence and severity of gingivitis and oral hygiene condition in school children aged (11) and (12) years in Qadha Sinjar.

MATERIALS AND METHODS

Target populations of the study were primary school children aged (11) and (12) years old in Qadha Sinjar, Ninevah Governorate.

The clinical examinations were carried out in the classroom under natural daylight using plane mouth mirror, and WHO periodontal probe was used to detect the dental plaque and gingival health.

The indices used for assessment of dental condition were as follow:

- ① Plaque Index by Silness and Loe⁽²¹⁾ to evaluate the oral hygiene of the children.
- ② Gingival Index by Loe and Silness⁽²²⁾ to evaluate the gingival health of the children.

The severity of gingival inflammation assessed as follow:

Score Range	Severity of Gingivitis
0.1 – 1.0	Mild
1.1 – 2.0	Moderate
2.1 – 3.0	Severe

Six teeth were selected for scoring; these are (3), (9), (12), (19), (25) and (28). For surfaces of each tooth (buccal, mesial, distal and lingual) were assessed.

Additional information relevant to this study were recorded as age, sex and tooth brushing frequency.

The statistical analyses of the data include the mean and standard deviation for plaque and gingival indices. The differences in plaque score and gingival health between age group and sexes were tested statistically using t-test, chi square test was used to determine the differences in severity of gingivitis and the difference in frequency of tooth brushing between age and sexes.

RESULTS

There were (388) children comprising (47.4%) boys and (53.6%) girls. The population sample was divided into two age groups (table 1).

Table (1): The number and percentage of children distributed according to sex and age groups

Age	Males		Females		Total	
	No.	%	No.	%	No.	%
11	74	42.5	100	57.5	174	44.8
12	110	51.4	104	48.6	214	55.2
Total	184	47.4	204	53.6	388	100

Table (2) revealed the number and percentage of children according to the frequency of tooth brushing. The study showed that about (42.3%) of the total sample did not brush their teeth at all and (21.4%) brush their teeth infrequently. The age group (11) years old brush their teeth more frequently than the age group (12) years; while the females in the total sample reported better practicing tooth brushing than males.

Table (2): The number and percentage of children according to tooth brushing frequency by sex and age groups

Age	Sex	No.	Frequency of Brushing							
			No		Infrequent		Once		Twice or More	
			No.	%	No.	%	No.	%	No.	%
11	Males	74	23	31.1	21	28.3	15	20.3	15	20.3
	Females	100	38	38	32	32	17	17	13	13
	Total	174	61	35	53	30.5	32	18.4	28	16.1
12	Males	110	64	58.2	13	11.8	27	24.5	6	5.5
	Females	104	39	37.5	17	16.3	33	31.7	15	14.4
	Total	214	103	48.1	30	14	60	28	21	9.9
Total Males		184	87	47.3	34	18.5	42	22.8	21	11.9
Total Females		204	77	37.7	49	24.1	50	24.5	28	13.7
Total Sample		388	164	42.3	83	21.4	92	23.7	49	12.6

χ^2 test between total males and females:

$\chi^2 = 3.99$

d.f = 3

$p > 0.05$

The mean plaque index score and gingival health were shown in table (3). The mean plaque score for the total sample was (1.06); the girls reported less significant plaque score than boys in both age groups and for the total sample. Both age groups (11 and 12 years) reported similar mean plaque score.

The mean gingival score for the total sample was (1.45). Although the girls reported less significant gingival mean than boys for both age groups and for the total sample the age group (11) years recorded slightly less gingival mean than (12) years old.

Table (3): The mean and standard deviation of plaque and gingival indices According to sex and age groups

Age	Sex	PI	GI
		Mean \pm SD	Mean \pm SD
11	Males	1.14 \pm 0.422	1.53 \pm 0.531
	Females	1.04 \pm 0.405*	1.37 \pm 0.490*
	Total	1.08 \pm 0.411	1.43 \pm 0.509
12	Males	1.12 \pm 0.428	1.59 \pm 0.526
	Females	0.96 \pm 0.396**	1.34 \pm 0.498**
	Total	1.04 \pm 0.408	1.46 \pm 0.512
Total Males		1.13 \pm 0.425	1.56 \pm 0.529
Total Females		1.00 \pm 0.402**	1.35 \pm 0.492**
Total Sample		1.06 \pm 0.407	1.45 \pm 0.510

* Significant difference at (0.05) level ($p < 0.05$) between the sex.

** Highly significant difference at (0.01) level ($p < 0.01$) between the sex.

Table (4) showed the number and percentage of children according to the severity of gingival inflammation. The result revealed that only three children (0.8%) were healthy (score = 0), and (17%) of them had mild gingival inflammation, (73.5%) had moderate inflammation and (8.7%) had severe gingivitis. The girls reported better gingival health than boys with significant differences between them.

Table (4): The number and percentage of children according to the severity of gingival inflammation by sex

Severity of Gingival Inflammation	Males		Females		Total	
	No.	%	No.	%	No.	%
Healthy	2	1.1	1	0.5	3	0.8
Mild	26	14.1	40	19.6	66	17
Moderate	138	75	147	72.1	285	73.5
Severe	18	9.8	16	7.8	34	8.7

 $\chi^2 = 204.53$

d.f = 3

 $p < 0.01$

DISCUSSION

There are several diseases which affect the gingiva and the bone supporting the teeth (periodontal tissues). Most of the individuals who have some natural teeth have chronic periodontal disease. This may be confined to the gingival or gingiva tissue (gingivitis) or may involve the deeper supporting tissue including the bone (periodontitis). Most children have gingivitis of ranging severity, while periodontitis affect a sizeable minority of teenagers and most adults. It is, therefore, important to prevent the onset of periodontitis or at least to slow its rate of progress in order that more people can retain their natural dentitions.

The tooth brushing frequency indicated that about (63.7%) of the total sample did not brush their teeth or brush infrequently, while quarter of them brush once daily and (12.6%) brush twice or more daily. The findings of this study showed that the girls reported slightly higher frequency of brushing their teeth once or more daily than boys. The percentage of children brushing their teeth is in accordance with other studies carried out in Iraq in peri-urban area^(20, 23), and higher than other studies carried out in rural areas^(19, 24, 25), while less than many studies carried out in urban areas^(23, 26, 27).

Concerning sex variation in relation to tooth brushing, the study revealed that girls reported better oral hygiene habits than boys because the girls are more interested in their appearance. However, the differences between them were not significant. This finding is in accordance with other studies^(8, 26, 28).

The mean plaque score for the total sample was (1.06); the mean was nearly equal in both age groups, while the girls reported less mean plaque than boys with statistically significant difference between them for age group (11) years ($p < 0.05$), for age group (12) years and for the total sample ($p < 0.01$).

The mean plaque score in this study reported to be less than the other studies used the same criteria and for the same age group in rural area^(19, 23) and in urban area^(19, 23, 27, 29). The reason may be due to variation between the examiners in different studies or due to the effect of fluoride in dental plaque formation because in this area (Qadha Sinjar) the concentration of fluoride in drinking water used is (2.05–2.22) ppm fluoride⁽³⁰⁾.

The result of study indicated that only (0.8%) of children are healthy; that mean almost the total sample of children had gingivitis. This was in agreement with other studies carried out in Iraq for rural areas^(31–33) and for urban areas^(19, 23, 34).

The mean gingival score was (1.45) for the total sample; the mean was similar in both age groups, while the girls reported less mean gingival score than boys with statistically significant difference between them for age group (11) years ($p < 0.05$), for (12) years and for total sample ($p < 0.01$). This was in accordance with other studies^(19, 35), while other study reported slightly less mean gingival score in girls than boys with no significant difference between them^(15, 18, 34). The better gingival health in girls than boys may be attributed to more concerning of the girls about their looking as well as they consistently more likely to brush frequently and tend to practice better oral hygiene^(28, 36).

The result of the study indicated that $\frac{3}{4}$ of the total sample have moderate gingivitis, while only (17%) of them have mild gingivitis. The girls reported better in severity of gingival inflammation than boys with significant differences between them. This finding is in accordance with other studies carried out in many peri-urban areas in different Governorates of Iraq⁽²⁰⁾ and it is better than a study carried out in rural area⁽³³⁾.

The mean gingival score for total sample was moderate and $\frac{3}{4}$ of the sample had moderate degree of gingivitis. This reflects the amount of dental plaque present in the sample and the frequency of tooth brushing. However, the effectiveness of their cleaning is frequently inadequate. This would be in keeping with the conclusion that frequency of brushing does not necessarily reflect thoroughness^(14, 37).

Therefore, the most efficient way to prevent periodontal disease is to control it in childhood and teenage life. It is especially important to take advantage of the school setting where it is possible to reach large number of school children with well planned preventive measure. This can be carried out by dental health education to those children to brush their teeth regularly and to improve the effectiveness of oral hygiene practices.

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