

Oral health status among secondary school students in Mosul City Centre/Iraq

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ABSTRACT

Aims: To evaluate the oral hygiene and gingival health among secondary school students and to find if there was any variation between age and sex groups in Mosul City Centre. **Material and Methods:** A sample of 630 students aged 16–18 years old (278 males, 352 females) were examined using plaque index score and gingival index. The clinical examinations were carried out in the school using plane mouth mirrors, WHO periodontal probes to detect the dental plaque and gingival health. **Results:** Showed that the mean plaque score for the total sample was 0.96, the plaque index increased with age. Females reported less mean plaque scores than males with statistically significant difference between them. The mean gingival score was 0.56 for the total sample and it increased with age. There was a significant difference between males and females. The study revealed that 35.9% of the total sample did not brush their teeth. Therefore the objective of dental health education to those subjects is to brush their teeth regularly and to improve the effectiveness of oral hygiene practice. **Conclusion:** Periodontal disease is indirectly related to the exposure of bacterial plaque for long time which calls for coordinated planning of preventive strategies and urgent priorities.

Key Words: Oral cleanliness, plaque index, gingival index, secondary school students.

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INTRODUCTION

Periodontal disease is a generalized term for a range of the pathological condition affecting the supporting and investing structure of the teeth⁽¹⁾, which caused by dental plaque, which reforms constantly after cleaning and is affected by diet. Bacterial plaque produces a number of substances which may penetrate the gingiva and causes inflammation.⁽²⁾ Most children have gingivitis of varying severity, while periodontitis affected a sizeable minority of teenagers and most adults so it is important to prevent the onset of the disease or at least to slow its rate of progression in order that more people can retain their natural dentitions.^(3,4)

The hormonal changes associated with puberty may be responsible for the peak⁽⁵⁾, which is recognized in this age group, the temporary decline in prevalence and severity after puberty may reflect an increase in social awareness and resulting improved oral hygiene. So the most effective means of promoting oral health are these health care practices performed by people

themselves with tooth brushing being sited as "the most appropriate and hygiene habit".^(6,7)

Preventive strategies, treatment of periodontal disease, and supportive care regimens may all be supplemented in certain circumstances by chemical methods of plaque control although chemical antiplaque agents not be regarded as a convenient replacement for the more traditional mechanical means of eliminating dental plaque.⁽⁸⁾

The aims of the study were to evaluate the oral hygiene and gingival health among secondary school students and to find if there was any variation between age and sex groups in Mosul City Centre.

MATERIAL AND METHODS

The samples of the study were composed of 630 secondary school students (278 males, 352 females) selected randomly from four secondary schools (2 for boys, 2 for girls) in Mosul City Center. The samples were divided into 3 age groups namely 16, 17 and 18 years old, which

represent the first, second and the last year of secondary schooling.

Each student was asked about frequency of tooth brushing by direct contact whether infrequent, once, twice or more. Each student was sit in upright position in front of the examiner.

The clinical examinations were carried out in the schools using adequate day light, plane mouth mirrors, WHO periodontal probes to detect the dental plaque and gingival health.⁽⁹⁾

The indices used for assessment of gingival and periodontal condition were as follow:

1– Plaque index by Silness and Le⁽¹⁰⁾ to evaluate the oral hygiene of the students are:

Score 0: No plaque in gingival area.

Score 1: A film of plaque adherent to the gingival margin and the adjacent area of the tooth. The plaque may only be recognized by running a probe across the tooth surface.

Score 2: A moderate accumulation of soft deposit within the gingival pocket on the tooth and gingival margin. This can be recognized with the naked eye.

Score 3: A heavy accumulation of plaque within gingival pocket or on the tooth and

gingival margin.

2– Gingival index by Le and Silness⁽¹¹⁾ to evaluate the gingival health of the students.

Score 0: Normal gingiva.

Score 1: *Mild inflammation:* This includes slight change in colour, slight oedema, no bleeding on probing.

Score 2: *Moderate inflammation:* Redness, oedema, bleeding of the gum on probing.

Score 3: *Severe inflammation:* Marked redness, oedema ulceration and there is a tendency for spontaneous bleeding.

The statistical analysis of the data included the mean and standard error for plaque and gingival indices using one way analysis of variance (ANOVA) and Duncan's Multiple Range Test. Comparing between total males and females was done using F-ratio test. Differences were tested for their significance for plaque index and gingival index at $p \leq 0.0001$ level.

RESULTS

There were 630 secondary school students comprising 44.1% males and 55.9% females. The population samples were divided into three age groups (Table 1).

Table (1): Number and percentage of individuals distributed according to sex and age groups

Age Group (years)	Male		Female		Total	
	No.	%	No.	%	No.	%
16	86	30.94	175	49.72	261	41.43
17	96	34.53	87	24.72	183	29.05
18	96	34.53	90	25.56	186	29.52
Total	278	100	352	100	630	100

No: Numbers of samples

Table (2) showed the number and percentage of students according to the frequency of tooth brushing. The study indicated that about 35.9% of the sample did not brush their teeth. The females reported less frequently brush their teeth (35.8%) than males (45.2%) once or twice and more daily. Also the older age groups (17 and 18 years) in males reported more frequently brushed their teeth than younger age groups (16 years old) while in females the

frequency of tooth brushing increased for students who brushes their teeth infrequently.

Table (3 and 4) showed the plaque index scores according to sex and age groups. The mean plaque for the total sample was 0.97 and males reported higher mean than females in all age groups and the total males also higher than total females with statistical significant difference at $p \leq 0.0001$.

The study showed that the mean plaque increased with age with significant difference

between 16 and 17, 16 and 18 years old.

Table (2): Frequency and percentage distribution of individuals according to tooth brushing by sex and age groups

Sex	Frequency of tooth brushing	Age Group (years)							
		16		17		18		Total	
		No.	%	No.	%	No.	%	No.	%
Male	Never	45	52.3	40	41.6	40	41.6	125	45.0
	Infrequent	23	26.7	30	31.3	30	31.3	83	29.9
	Once	15	17.5	24	25.0	24	25.0	63	22.7
	Twice or more	3	3.5	2	2.1	2	2.1	7	22.5
Female	Never	69	39.4	15	17.2	17	18.9	101	28.7
	Infrequent	47	26.9	31	35.6	47	52.2	125	35.5
	Once	27	15.4	20	23.1	17	18.9	64	18.2
	Twice or more	32	18.3	21	24.1	9	10.0	62	17.6
Total	Never	114	43.7	55	30.1	57	30.7	226	35.9
	Infrequent	70	26.8	61	33.3	77	41.4	208	33.0
	Once	42	16.1	44	24.0	41	22.0	127	20.2
	Twice or more	35	13.4	23	12.6	11	5.9	69	10.9

Table (3): Analysis of Variance of plaque index (PI) according to sex and age groups

Source	df	Sum of square	Mean square	F-value	P-value
Between groups	2	5.534	2.767		
Within groups	349	42.526	122	22.706	.000
Total	351	48.059			

df: degree of freedom.

Table (4) Duncan Multiple Range Test of plaque index (PI) according to sex and age groups

Age groups (years)	Mean \pm SE		
	Male	Female	Total
16	1.03 \pm 0.04a	0.94 \pm 0.028b	0.97 \pm 0.024b
17	1.04 \pm 0.04a	0.67 \pm 0.04a	0.86 \pm 0.03a
18	1.04 \pm 0.04a	1.0 \pm 0.03b	1.02 \pm 0.02b
Total	1.04 \pm 0.36*	0.89 \pm 0.02*	0.96 \pm 0.02

Means with the same letters are statistically not significant at ($p > 0.05$)

Table (5 and 6) showed the mean gingival score index according to sex and age groups. The mean for the total sample was

0.54. Males reported higher mean gingival score than females; this difference was found to be significant at $p \leq 0.0001$.

Table (5): Analysis of Variance and Duncan Multiple Range Test of gingival index according to sex and age groups

Source	df	Sum of square	Mean square	F-value	P-value
Between groups	2	1.975	0.987		
Within groups	349	43.429	124	7.935	.000
Total	351	45.404			

df: degree of freedom.

Table (6): Duncan Multiple Range Test of gingival index according to sex and age groups

Age groups (years)	Mean \pm SE		
	Male	Female	Total
16	0.60 \pm 0.03a	0.52 \pm 0.03a	0.54 \pm 0.02a
17	0.61 \pm 0.03a	0.44 \pm 0.04a	0.53 \pm 0.03a
18	0.61 \pm 0.03a	0.64 \pm 0.04b	0.63 \pm 0.03b
Total	0.60 \pm 0.02*	0.53 \pm 0.02*	0.56 \pm 0.01

Means with the same letters are statistically not significant at ($p > 0.05$)

DISCUSSION

Tooth brushing data indicated that about 35.9% of the sample did not brush their teeth. The percentage of subjects brushed their teeth is less than other studies carried out in developed countries⁽¹²⁻¹⁶⁾ and it was higher than studies carried out in Iraq⁽¹⁷⁻²¹⁾ but less than other study carried out in Iraq⁽²²⁾ (50%) and in Yemen⁽²³⁾ (45.1%). These differences could be attributed to differences in person's habitual behavior, dental health education, occupation and income level.

In this study females reported less frequently brush their teeth (35.8%) than males (45.2%) especially in younger age groups. This is not in accordance with many studies carried out in developing and developed countries.⁽¹⁴⁻²⁶⁾ The mean plaque score for the total sample was 0.94. There was a significant difference between 16 and 17, 17 and 18 years old but not all age groups. This may be attributed to the fact that the amount of plaque is influenced by person's oral hygiene and by various plaque retention factors. This is not in accordance with many studies carried out in developed and developing countries.⁽²⁷⁻³⁰⁾

Females reported less mean plaque score than males with statistical significant difference between them because the frequency with which teeth are brush does not necessarily imply effective plaque removal.

al. This is in accordance with many studies in developed and developing countries.⁽²⁷⁻³¹⁾

The mean gingival score was 0.56 for the total sample and it increased with age because tooth brushing is associated with grouping and personal hygiene or due to other causes like hormonal changes due to puberty, or due to less attitude to visit dental clinic and even for those brushes their teeth, they brush in incorrect way, as a high plaque was reported. This is in accordance with many studies^(5,21,32,33). This study showed that the gingival health in females was better than males with statistical significant difference because females brush their teeth more effectively than males because they care much about their looking; i.e., gingival health was worse in males. This confirms the finding of other studies carried out in the developing and developed countries.⁽³⁴⁻⁴⁰⁾

CONCLUSION

Gingival and periodontal diseases are indirectly caused by accumulation of plaque biofilm for long time which calls for integrated and coordinated planning of preventive programs especially for developing countries.

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