

The effect of tooth brushing frequency on plaque, gingival indices in Thamar Governorate (primary, intermediate, secondary schools) in Republic of Yemen

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Abstract:

An oral health Survey was conducted in Thamar Governorate schools (primary, intermediate, secondary schools). Certain aspects of oral health were investigated. The sample included 1758 students aged from 6-18 years old of both sexes (843 males, 915 females). The study has shown that 44.03% of the students did not brush their teeth, however, brushing

Standards did not seem to be satisfactory, this was judged by the high plaque & gingival index mean for the sample and for different groups with in the sample.

Key words:

Tooth brushing, plaque, gingival Indices, oral hygiene.

Introduction:

The study was conducted in Thamar Governorate in the Republic of Yemen during the period between November 2001-January 2002 .It aimed at:

- 1-providing a picture of certain aspects of oral health among 6-18 years old Students' schools.
- 2-studying the effect of tooth brushing frequency on plaque and gingival indices.
- 3-providing base line data which could be used in future studies and for planning dental health services in the

Republic of Yemen specially this was the first study conducted on school children which represents the base of community.

Young children copy the tooth brushing of their parents & teachers. In adolescents, tooth brushing is an integral part of personal hygiene and grooming behavior⁽¹⁾. Tooth brushing behavior is not primarily health directed in most people it is health related (to be more attractive)^(2,3).

Oral health care professionals recommend brushing teeth once or more times a day to control plaque.

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Materials and Methods:

The sample consisted of 1758 students aged from 6-18 years old of both sexes (843 males, 915 females) randomly selected.

The clinical examinations were carried out in the schools using adequate day light, plane mouth mirror and WHO periodontal probe to detect dental plaque and gingival health⁽⁴⁾.

Questionnaires have been distributed to all of the students before any oral examination was done. Several questions have been used to assess tooth-brushing frequency. Code no.1 was given for those who never clean their teeth. Code no. 2 was given for those who clean their teeth infrequently. Code no.3 was given for those who clean their teeth once a day. Code no. 4 was given for those who clean their teeth twice or more daily.

The indices used for assessment of gingival and periodontal conditions were

- 1-Plaque index (PI) by Silness and Loe (1964) to evaluate the oral hygiene (O.H.) of the students⁽⁵⁾,
- 2- Gingival index (GI) by Silness and Loe (1963) to evaluate the gingival health of the students⁽⁶⁾.

The statistical analysis of the data included the mean and standard error for plaque and gingival indices using Chi square test, Duncan multiple range test. Differences were tested for their significance for plaque and gingival indices using F-test at (0.01) level.

Results:

The mean plaque index and gingival index for the students by sex is shown in Table (1).

Table (1): Shows plaque index (pl), Gingival index mean for the students by sex.

Sex	No.	PI	GI
		Mean \pm Std err.	Mean \pm Std err.
Male	843	0.97 \pm 1.28	0.5 \pm 1.32
Female	915	0.81 \pm 1.23	0.47 \pm 1.18
Total	1758	0.89 \pm 9.01*	0.52 \pm 8.93**

* d.f. =1757, F =79.35, $p < .001$

**d.f. = 1757, F = 37.7, $p < .001$

The effect of tooth brushing frequency by sex and age on the mean

plaque and gingival scores is shown in Table (2).

Table (2): Shows the effect of tooth brushing frequency by sex and age for (6, 9, 12) years old on plaque and gingival indices (Mean & Std. Error).

	TbF.	Age 6		Age 9		Age 12	
		M	F	M	F	M	F
PI	1	0.75±0.05 a	0.54±0.07 a	1.02±0.07 a	0.96±0.05 a	0.94±0.06 a	0.73±0.04 a
	2	0.70±0.08 a	0.69±0.07 a	0.86±0.10 a	0.86±0.06 a	0.72±0.08 a	0.74±0.09 a
	3	0.74±0.14 a	0.63±0.13 a	0.97±0.08 a	0.94±0.08 a	0.87±0.08 a	0.82± 16 a
	4	0.50±0.26 a	0.53±0.15 a	0.98±0.08 a	0.91±0.15 a	0.94±0.08 a	0.82±0.18 a
GI	1	0.33±0.05 a	0.21±0.67 a	0.63±0.07 a	0.41±0.05 a	0.65±0.06 a	0.35±0.05 a
	2	0.41±0.08 a	0.41±0.07 ab	0.48±0.10 a	0.46±0.07 a	0.42±0.09 a	0.40±0.09 a
	3	0.40±0.15 a	0.50±0.13 b	0.70±0.08 ab	0.68±0.08 a	0.70±0.08 a	0.48±0.17 a
	4	0.22±0.26 a	0.52±0.15 b	1.0±0.08 b	0.51±0.15 a	1.07±0.09 b	0.36±0.19 a

*TbF=Tooth brushing frequency.

The effect of tooth brushing frequency by sex and age on the mean

plaque and gingival scores is shown in Table (3).

Table (3): Shows the effect of tooth brushing frequency by sex and age for (13, 14,15) years old on plaque and gingival indices (Mean & Std. Error).

	TbF	Age 13		Age 14		Age 15	
		M	F	M	F	M	F
PI	1	1.01±0.05 a	0.64±0.04 a	1.05±0.04 b	0.80±0.09 a	1.16±0.04 a	0.87±0.1 a
	2	0.82±0.06 a	0.76±0.06 a	0.97±0.07 b	0.91±0.05 a	1.05±0.10 a	0.88±0.06 a
	3	0.93±0.07 a	0.74±0.06 a	0.85±0.11 ab	0.76±0.07 a	0.94±0.11 a	0.59±0.11 a
	4	0.88±0.13 a	0.61±0.09 a	0.67±0.09 a	0.69±0.09 a	0.89±0.08 a	0.74±0.13 a
GI	1	0.58±0.05 a	0.28±0.03 a	0.60±0.05 b	0.56±0.11 ab	0.60±0.04 a	0.55±0.10 a
	2	0.48±0.08 a	0.40±0.04 ab	0.48±0.05 ab	0.46±0.04 a	0.62±0.09 a	0.50±0.05 a
	3	0.53±0.10 a	0.49±0.07 b	0.34±0.07 a	0.80±0.11 b	0.33±0.03 a	0.55±0.12 a
	4	0.57±0.11 a	0.40±0.08 ab	0.32±0.08 a	0.54±0.04 ab	0.61±0.10 a	0.6±0.15 a

The effect of tooth brushing frequency by sex and age on plaque and

gingival indices is shown in Table (4).

Table (4): Shows the effect of tooth brushing frequency by sex and age for (16, 17, 18) years old on plaque and gingival indices (Mean & Std. Error).

	TbF	Age 16		Age 17		Age 18	
		M	F	M	F	M	F
PI	1	1.07±0.07 a	1.0±0.05 a	1.2±0.05 a	0.62±0.06 a	1.2±0.05 a	1.0±0.08 a
	2	1.0±0.07 a	0.94±0.06 a	1.0±0.06 a	0.8±0.05 a	0.9±0.06 a	1.0±0.04 a
	3	1.02±0.07 a	0.9±0.07 a	1.0±0.08 a	0.6±0.08 a	1.0±0.08 a	1.0±0.07 a
	4	1.0±0.17 a	0.9±0.05 a	1.0±0.03 a	0.6±0.09 a	1.0±0.03 a	1.0±0.12 a
GI	1	0.6±0.05 a	0.54±0.04 a	0.70±0.05 a	0.21±0.04 a	0.70±0.05 b	0.67±0.09 a
	2	0.6±0.05 a	0.52±0.06 a	0.6±0.06 ab	0.5±0.06 ab	0.6±0.06 ab	0.58±0.05 a
	3	0.7±0.10 a	0.51±0.06 a	0.3±0.05 ab	0.53±0.08 b	0.53±0.05 ab	0.72±0.07 a
	4	0.4±0.17 a	0.44±0.05 a	0.30±0.11 a	0.4±0.04 b	0.3±0.11 a	0.71±0.19 a

The effect of tooth brushing frequency by sex and age as total on

plaque and gingival indices is shown in Table(5).

Table (5): Shows the effect of tooth brushing frequency by sex and age as total on plaque and gingival indices (Mean & Std. Error). The result indicates that the mean (PI) and (GI) score is higher significantly in males than females.

	Sex	Mean	No.	Std. Error of Mean
PI	M	0.97	843	± 1.28
	F	0.81	915	± 1.23
	Total	0.89	1758	± 9.10
GI	M	0.58	843	± 1.32
	F	0.47	915	± 1.18
	Total	0.52	1758	± 8.93

$$\text{Chi}^2 = 36.26$$

Discussion:

Table (1) shows that plaque, gingival indices for the students by sex, it shows that males had a significantly higher plaque and gingival indices mean than females at ($p < 0.001$) level this result is in agreement with the finding of many other investigators⁽⁷⁻¹¹⁾ this may be attributed to the better tooth brushing behavior among females⁽¹²⁻¹⁵⁾.

Table (2, 3, 4) shows the effect of tooth brushing frequency on plaque and gingival indices means by sex for ages from (6-18) years old, in general frequency of tooth brushing has no effect on plaque and gingival indices, this stated that effectiveness of brushing is more important than frequency, this is in agreement with many studies^(16, 17).

According to the frequency of tooth brushing the males show higher PI and GI than females with no statistical

significant difference except for (6, 19, 12, 17) years for those who brush their teeth twice or more with significant difference at 0.05 level using Duncan multiple range test, also there is significant difference for those who brush their teeth once for (6, 13, 14) years old, females brush their teeth more effectively than males because they care more for their appearance than males, this is in agreement with many findings⁽⁷⁻¹¹⁾, while there is no statistical significant difference in sex between those who brush their teeth in frequently.

Concerning age the mean PI & GI increases by increasing age, this is in agreement with many studies carried out in Baghdad and Mosul in Iraq^(14, 15).

Table (5) shows the mean plaque and gingival indices by sex, results has shown that prevalence of plaque and gingival inflammation

reflects high degree of negligence of proper O.H measures among males.

The study had demonstrated that 44.03% of students did not seem to brush their teeth, approximately half of the sample didn't brush their teeth correctly & the other half didn't brush effectively which is in accordance with the study of Wade in which Iraqi school children claimed to brush their teeth daily^(10, 13), this study is in contrast with the findings of other parts of the World for example 98% of west German adolescents brush their teeth daily, In Northern Ireland, for instance 91% of adults stated that they brushed their teeth once a day^(18,20).

Freeman et al⁽¹⁹⁾ stated that females brush daily more regularly, more frequently than males, this finding is in agreement with many studies in developing and developed countries^(9-11,21-23).

This suggests that people's ability to control plaque effectively is impaired and there is a need to improve the effectiveness of tooth brushing and interdental cleaning. Patients do not need to change their health behaviors but rather modify their existing practices⁽¹⁹⁾ and that tooth brushing frequency increases with education, occupation and income level^(12, 24-28).

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