

## Social Characteristics and Oral Self-care Practices Associated with Periodontal health status among a Sample of Yemeni Dental Students

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**Abstract: Objective:** To evaluate the relationship between the periodontal health status with some social characteristics and oral self-care practices among a sample of Yemeni dental students.

**Materials and Methods:** This cross-sectional study was conducted on undergraduate dental students at University of Thamar. Two hundreds (120 male and 80 female) volunteers (mean age:  $21.82 \pm 1.96$ ) who participated in the study completed the self-administered questionnaire. Subsequently a clinical examination for their gingival and periodontal conditions was performed. Crosstabs, Chi-squared test and Regression analysis were executed on the data.

**Results:** The findings of the study showed that female subjects were significantly more than males in oral self-care practicing ( $P < 0.05$ ). No significant relationship between the family income with all recorded scores was found ( $P > 0.05$ ). Likewise, the relationship between periodontal conditions with the study phase was insignificant. Unequally significant relationships between oral self-care practices with the clinical recorded scores were observed.

**Conclusion:** Dental students showed poor oral self-care practices which reflected on their periodontal health status. It is recommended that dental education and health care services should be improved to overcome these unsatisfactory results among the participants.

**Keywords:** Oral self-care; periodontal health status; dental students; Yemen.

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### I. Introduction

The Oral hygiene is the level of oral cleanliness of an individual. Assessment of oral hygiene is based on the accumulation of soft and hard deposits on teeth surfaces which are considered the etiological factors for periodontal diseases. Evaluation of individuals' oral hygiene reasonably reflects their gingival and periodontal health as the soft and hard deposits on the tooth are implicated in gingivitis, periodontitis, and halitosis [1-4].

Periodontal disease, including gingivitis and periodontitis, is one of the main oral pathologies that still broadly affect all populations throughout the lifespan. If this disease was left without any treatment, it can lead to tooth/teeth loss [4]. Progress of periodontal diseases depends predominantly on effective plaque control. Thus, optimum control of plaque is considered a significant factor in prevention of the periodontal disease as well as it is crucial part in the management of inflammatory periodontal diseases [5]. However, the optimum plaque control cannot be achieved without interactive motivation which includes educational and informative knowledge for the patient about the initiating cause/causes for inflammatory periodontal changes [5-7].

One of the main objectives of dental education is to train students who can motivate patients to adopt good oral hygiene. Therefore, dental students must acquire knowledge, beliefs, attitudes and practices which positively affect the oral health of their patients, families and colleagues from other disciplines [8]. Oral health professionals should motivate patients and give basic instructions to enable patients to maintain good oral health [9, 10]. Preventive knowledge and oral self-care behavior of dental students may play an important role in their practicing careers encouraging them to maintain good oral health for their patients [11]. Therefore, the dental students are expected to be a good model for oral health behavior in nation.

Yemen is a poor developing country located South-West of Arabian Peninsula to Kingdom of Saudi Arabia. For most people in Yemen, dental care does not have the same intuitive quality of life dimension as health care in general. Additionally, Yemen governorate has been handling the major health problems such as tuberculosis and malnutrition which have high mortality rates. As a result, oral health is not yet regarded as a high priority by Yemen governorate [12]. Therefore, a major emphasis on oral health is placed on curative rather than preventive services supplied by Yemeni governorate.

Even though some studies reported that the prevalence of periodontal disease among Yemeni population is still higher compared to other countries [13, 14], the nation-wide baseline data on oral health status and periodontal condition in Yemen is still not available. In addition, no publication data is obtainable about oral

health status among dental students in Yemen. Consequently, this study was aimed to assess the oral hygiene and periodontal health status among sample of Yemeni dental students.

## **II. Materials And Methods**

A cross-sectional study was conducted on undergraduate dental students at University of Tamar, Dhamar city, Yemen. The study subjects comprised of 200 students with mean age ( $21.82 \pm 1.96$ ) ranged from 18-30 years. To evaluate the differences and variations in response among dental students in the different study phases, 40 students were randomly recruited from each class. The study was approved by Research and Ethics Committee, Faculty of Dentistry, University of Tamar. All participants were informed about the purpose of the study and a written consent form was obtained.

The self-administered questionnaire designed for the purpose of this study was adapted from a previous study [14]. It was divided into two sections:

Section I: Sociodemographic variables regarding gender, age, study phase (1st – 5th class), and family income (low, moderate, and high).

Section II: Oral health practices regarding toothbrushing, frequency of toothbrushing, and using of interdental aids.

### **Clinical examination and indices:**

The clinical examination was carried out by the first author (specialist in periodontology). The data were collected while the student was seated in a dental chair with professional light.

Indices for gingival and periodontal status were investigated. The indices comprised of plaque index, gingival index, calculus index, bleeding index, periodontal pocket depth, loss of attachment and gingival recession.

Plaque and gingival scores were measured on a scale of (0-3) according to [15, 16], while the amount of calculus deposits was assessed by the Calculus Surface Index (CSI). The presence or absence of supra- and/or sub-gingival calculus was determined by visual or tactile examination using a mouth mirror and dental explorer [17]. Both plaque and gingival indices were measured by the use of a periodontal probe (Williams no.14) and a mouth mirror.

Periodontal pocket depth, gingival recession and loss of attachment were measured using a graduated periodontal probe marked up to 15mm. The pocket depth probing was recorded by measuring the distance from the gingival margin to the base of the clinical pocket, while the loss of attachment was obtained by calculating the distance from the cement-enamel junction (CEJ) to the bottom of the pocket. The gingival recession was recorded by calculating the distance from CEJ to the gingival margin. In some cases, in which the CEJ was covered by calculus, hidden by a restoration and/or possibly lost due to wear or carious lesions, gingival recession, therefore, was estimated on the basis of the adjacent teeth [18]. Three categories were established for the gingival recession; small recessions less than 3mm of root surface exposed, moderate recessions 3 to 4mm of root surface exposed and advanced recessions more than 4 mm of root surface exposed to the oral environment [19].

All returned forms were coded by a single operator and the data were checked and entered into a personal computer. Data were analyzed using Statistical Package for Social Science (SPSS) program (version 21; IBM Inc., Chicago. IL). Descriptive statistics in terms of central tendency measures, frequencies and charts were used in data analysis. Chi-squared test for independence was utilized to check the significance of differences between the measured variables. Regression analysis were executed to analyse the relationship between the self-administered questionnaire variables with the recorded scores. The significance threshold for all tests was set at  $p < 0.05$  with 95% confidence interval.

## **III. Results**

### **Response to the self-administered questionnaire:**

The distribution of the study sample is presented in (Figure 1). Of the participants, (60%) were males, while (40%) were females. Amongst them, (72%) had moderate monthly income, while (19.5%) were low income and (8.5%) had high monthly income. Most participants (91.0%) attended to brush their teeth. Regarding the time of toothbrushing, (23.0%) reported to brush only twice a day, yet up to (46.0%) claimed to brush once a day while the response was only (3.5%) for brushing three times a day. However, (17.0%) of the respondents used interdental aids where utilizing dental floss was the highest (13.5%) followed by the dental pick (2.5%) and the lowest one was the interdental brush (1%). In regard to the oral self-care practices among participants, toothbrushing was more frequent in female subjects than in males with significant difference ( $P= 0.001$ ) while no significant difference was found regarding the use of interdental aids between both sexes ( $P= 0.68$ ). Frequency of toothbrushing and using of interdental aids was not significant among the different study phases ( $P > 0.05$ ). However, toothbrushing and using of interdental aids were found significantly distributed among the different levels of the family income variable ( $P= 0.039$ ,  $P= 0.001$ ) respectively (Table 1).

### **Clinical recorded scores:**

The recorded scores during clinical examination are shown in (Figures 2). In regard to plaque deposits, majority of the participants had one or two plaque scores (54.0%, 42.0%) respectively, while in gingival index, most students had score one (65.0%) followed by score two (27.5%). About more than half (53.8%) were noticed with gingival bleeding on probing, while calculus noticed in (37.5%). Most of the participants (72.5%) had not periodontal pocket. About half of the participants (52.5%) didn't have any gingival recession, while 3 to 4mm gingival recession was seen in (34.5%).

### **Relationship between self-administered questionnaire variables with recorded scores**

#### **Gender:**

The plaque deposits were more frequent in males than in females, (52.5% and 3.3%) in male subjects for score2 and score3 respectively, while it was (26.3% and 0%) in female subjects for the same scores with significant difference (P=0.001). The relationship between gender and plaque index was also significant (P=0.017; CI= -.327, -.033). In female subjects score0 for gingival index was more frequent than in male subjects (13.8% and 3.3% respectively) with significant relationship between gender and gingival index (P=0.001; CI= -.446, -.158). Even though the regression analysis revealed no statistically significant relationship between bleeding on probing with gender (P=0.416; CI= -.192, .080), the bleeding index was less frequent in female subjects than in males, 46.3% for score0 and 53.8% for score1 in females compared with 30.8% for score0 and 69.2% for score1 in males with significant difference (P=0.02). In regard to the pocket depth index, the relationship with the gender was significant (P=0.018; CI= -1.254, -.117) and this is more obvious in the frequency of the pocket depth index among both sexes (P=0.004). For both loss of attachment and gingival recession indices there were significant differences in frequency among males and females with significant relationship (P=0.001; CI= -.835, -.395 and P=0.001; CI= -1.062, -.494 respectively). Significant difference was observed in the frequency of calculus index among both sexes (P=0.001) with significant relationship with gender (P=0.005; CI= -.325, -.060) (Table 2 & 3).

#### **Study phase:**

Although it was found a significant relationship between study phase with gingival recession and pocket depth indices (P <0.05), there were no significant differences in the frequency of all recorded scores among all different study phases (P > 0.05 for all variables). On the other hand, the relationships between study phase with plaque index, gingival index, and bleeding index were significant for gingival index and bleeding index but not significant for plaque index (P=0.013, P=0.016, and P=0.931 respectively). The relationship was also not significant with both loss of attachment and calculus index (P=0.059; CI= -.142, .003 and P=0.440; CI= -.061, .026 respectively) (Table 2 & 3).

#### **Family income:**

In the same way, there was no significant relationship between the family income with all recorded scores (P > 0.05 for all variables, Table 3). However, the frequency of distribution among the different levels of family income was highly significant (P <0.05 for all variables, Table 2). Plaque and calculus deposits were more occurrence in students with low family income followed by moderate then high income. Likewise, no gingival recession >4mm, loss of attachment >3mm, pocket depth >3mm, were observed during clinical examination in students with high level of family income. However, pocket depth, loss of attachment, gingival recession and bleeding on probing were more frequent in students with low family income followed by those with moderate family income (Table 2).

#### **Toothbrushing:**

Significant relationships were found between toothbrushing and all recorded scores except that with gingival recession the relationship was not significant (P=0.466; CI= -.662, .304) (Table 3). Similarly, no significant differences among respondents was found in response to the question: "Do you brush your teeth?" in relation to gingival recession (P=0.06) (Table 2).

#### **Using of interdental aids:**

It can be seen from Table 2 that there were significant differences in frequencies of the recorded scores among subjects regarding the use of interdental aids except the frequency in relation to pocket depth index (P=0.255). In Table 3, the relationship of using interdental aids with the recorded scores was found significant (P < 0.05) in four categories (plaque index, gingival index, bleeding index, and calculus index) while it was not significant (P > 0.05) in (pocket depth index, loss of attachment, and gingival recession).

## **IV. Discussion**

The aim of this study was set to assess the relationship between oral self-care practices with periodontal status among a sample of Yemeni dental students. Dental students, as a model for the whole society, should be more aware about oral and periodontal health and disease. Good knowledge and practice of oral self-care among

dental students will reflect on their society. Furthermore, the variations in favorability of oral self-care among participants reflect the students' interests, education, and their curriculum.

#### **Response to the self-administered questionnaire and recorded scores**

The entire participants in this study did not exhibit optimal oral cleanliness, where only 3.5% brushing their teeth three times daily and 23% brushing their teeth twice daily, while 46% of the whole study sample reported toothbrushing for only one time a day. A total of 17.0% of the participants used interdental aids regardless of their types. These results indicate the avoidance of the optimal teeth cleaning and might explain the poor oral hygiene status among the participants.

Female subjects reported toothbrushing more frequently than males. This result is consistent with previous studies [20]. However, no significant was found regarding the use of the interdental aids. This result may be due to the fact that the number of subjects who reported using of interdental aids is low (only 17% of the total sample). Surprisingly, frequency of toothbrushing and using of interdental aids was not significant in regard to the different study phases. These findings do not support the previous study conducted among dental students in Sana'a University, Yemen [20]. A possible explanation for that may be the lack of adequate good prevention courses and/or curriculum. However, oral self-care practices (toothbrushing and using of interdental aids) were significantly distributed among the different levels of the family income. All subjects (100%) with high family income reported toothbrushing followed by those with moderate family income (93.1%) while it was reported by (82.1%) of subjects with low family income. These findings are consistent with those of [21].

The current study also showed high frequency of plaque (score2, 42.0%) and calculus (score1, 37.5%) deposits. In addition, the normal appearance of the gingiva (score0) was only 7.5% among the whole study sample. This condition clearly signifies that poor oral hygiene is responsible for periodontal diseases among the students. These findings differ from some published studies among European populations [22-25], which demonstrated better oral hygiene. Of the participants, 14% had 4mm periodontal pockets, while 2% had 6mm periodontal pockets. Moreover, 23% had also 3-4mm loss of the attachment and the gingival recession of 3-4mm was reported in 34.5% of the participants. Again, the sub-optimal of oral cleanliness seen in this study is a possible explanation for worse recorded scores among the participants. The high occurrence of gingival bleeding on probing, periodontal pockets, loss of the attachment and gingival recession among the participants perhaps attributed to the plaque and calculus deposits. Another possible explanation for such results might be the khat chewing as common routine among Yemenis, particularly males, as reported in previous studies [13, 14].

#### **Relationship between self-administered questionnaire variables with recorded scores**

##### **Gender:**

The findings of this study showed poorer oral hygiene and higher measured scores in males than in females. This result is in the same line with the previous studies [20, 26-28], where females reported better oral health behavior than males regarding toothbrushing and using of interdental aids regularly. However, these results were disagreed with Khami et al. [29], who found no difference between males and females in the oral health attitude and behavior among Iranian dental students. A significant relationship ( $P < 0.05$ , Table 3) was found between gender with the recorded scores but bleeding index ( $P > 0.05$ , Table 3). Even though this insignificant relationship was found, the frequency of gingival bleeding on probing between both sexes was significant ( $P = 0.02$ , Table 2). This condition may be explained on the basis that females usually are more aesthetically conscious, thus would be more worried about visiting the dentist and would tend to be more educated about their dental and oral health even before entering a course related to preventive dentistry.

##### **Study phase:**

It was expected that students recruited from the clinical phases (4th & 5th phases) might have better periodontal health status than students from the pre-clinical phases (1st - 3rd phases) as they should be more aware about oral self-care practices and its importance for prevention against dental and periodontal diseases. Contrary to expectations, there was no significant difference regarding oral self-care practices (toothbrushing and using of interdental aids) observed among the different phases ( $P > 0.05$ , Table 1). Moreover, no significant improvement were found regarding the recorded scores ( $P > 0.05$ , Table 2). This is inconsistent with an earlier study [30], showing the importance of theoretical teaching in preventive dentistry. The findings also disagree with some previous studies [31, 32], which shown that the oral health attitudes become more positive with increasing in study phase. Neeraja et al. [33] also found, in a study performed among Indian dental students, that dental health attitude become more positive and was improved with progress in study phase. It is difficult to explain this result, but it might be related to the perceived stress among the dental students in particular the last two phases as the work load increases [34]. Such stress may negatively reflect the poor oral hygiene and oral self-care practices [35].

##### **Family income:**

The results of the current study showed a significant frequency of occurrence regarding the recorded scores as well as the oral self-care practices (Table 1 & 2) among participants with different levels of family income. Thus, poor oral hygiene and high recorded scores were found to be more frequent in students recruited

from low and moderate family income in comparison with higher family income participants. The high plaque and calculus deposits among the students recruited from low and moderate family income may be as a result of low priority placed on oral health care compared with other needs. These findings match those observed in earlier studies [36]. One unanticipated finding was that the insignificant relationship between family income with the recorded scores revealed by regression model ( $P > 0.05$ , Table 3). The reason for this is not clear but it might due to unequally distribution of the recruited students from each level (8.5% for high family income, 72% for moderate family income, and 19.5% for low family income). Even though this insignificant result is in agreement with Famili's findings [37] which showed insignificant relationship between periodontal diseases with family income, further study with large sample size and equally distribution of the family income levels among the participants is highly recommended.

#### **Toothbrushing:**

Significant distribution of toothbrushing was found in favor of all recorded scores ( $P < 0.05$ , Table 2) except the frequency regarding gingival recession ( $P > 0.05$ , Table 2). Moreover, the regression analysis revealed significant relationship between toothbrushing and all recorded scores ( $P < 0.05$ , Table 3) except with gingival recession ( $P > 0.05$ , Table 3). This insignificant result may be explained by the fact that the participants follow improper technique when brushing (especially horizontal scrubbing technique) [38-40]. The significant relationship between toothbrushing with the other recorded scores seem to be consistent with previous study in this field [41].

#### **Using of interdental aids:**

Regardless of its method, toothbrushing does not completely remove interdental plaque. Even for patients with wide-open dental embrasures [42, 43]. Since the majority of dental and periodontal diseases originate from interproximal surfaces/area, removal of interdental plaque is necessary [44]. Several studies have revealed that using of interdental aids as adjunct method alongside with toothbrushing is more effective in plaque removal. More specifically, interdental brush is more preferred and more effective as well in plaque removal than the other types of interdental aids [45, 46]. In the current study the distribution of frequency regarding the use of interdental aids was statistically significant in favor of all recorded scores except that with pocket depth index ( $P > 0.05$ , Table 2). Similarly, the relationship between using of interdental aids with all recorded scores was significant except with pocket depth index and loss of attachment ( $P > 0.05$ , Table 3). This inconsistency may be due to the few positive answers regarding the question "do you use interdental aids?" (only 17% of the study sample). Another possible explanation for this is the possible improper use of the interdental aids, particularly, the toothpick which was reported by the majority (79% of the positive answers). Oral self-care practices among the participants in this study was significantly associated with periodontal status assessed, as participants with poor oral hygiene were more likely to have poorer periodontal status. Therefore, the significant relationship between oral hygiene and periodontal status may be a contributory explanation.

The limitations of this study are evident. Since this study was cross-sectional, any changes in measured scores cannot be clearly attributed to the teaching curriculum. Therefore, further prospective longitudinal studies are recommended. Moreover, it is important to bear in mind the possible bias of the students' responses.

## **V. Conclusion**

Within the limitations of this study, it can be concluded that dental students showed poor oral self-care practices which reflected on their periodontal health status. Therefore, there is a need for interventions that specifically aim to improve oral self-care practices for the dental students. Females showed better oral self-care than males. There was unequally relationship between the oral self-care and periodontal status among participants. Based on the reported data in this study, it is recommended that dental education and health care services should be improved to overcome these unsatisfactory results among the participants. The authors recommend that curriculum of preventive dentistry should be modified in which must include practical sessions of brushing techniques alongside with the use of interdental cleaning aids to help in achieving good plaque control. These techniques must be constantly reinforced during the last year of dental education. In addition, the curriculum should encourage dental students to become models for oral health care in the hope that it would improve oral health behavior in Yemeni society.

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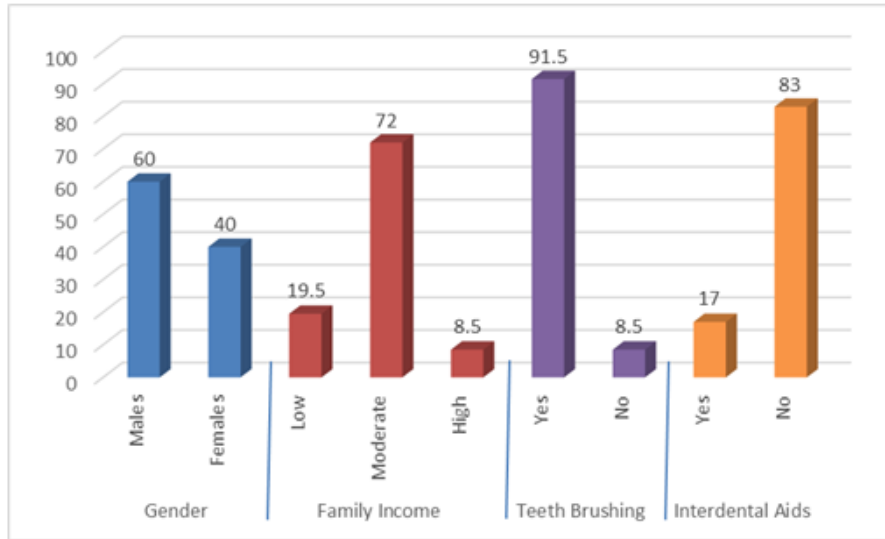


Figure 1: Distribution of response to the self-administered questionnaire among the study sample (%)

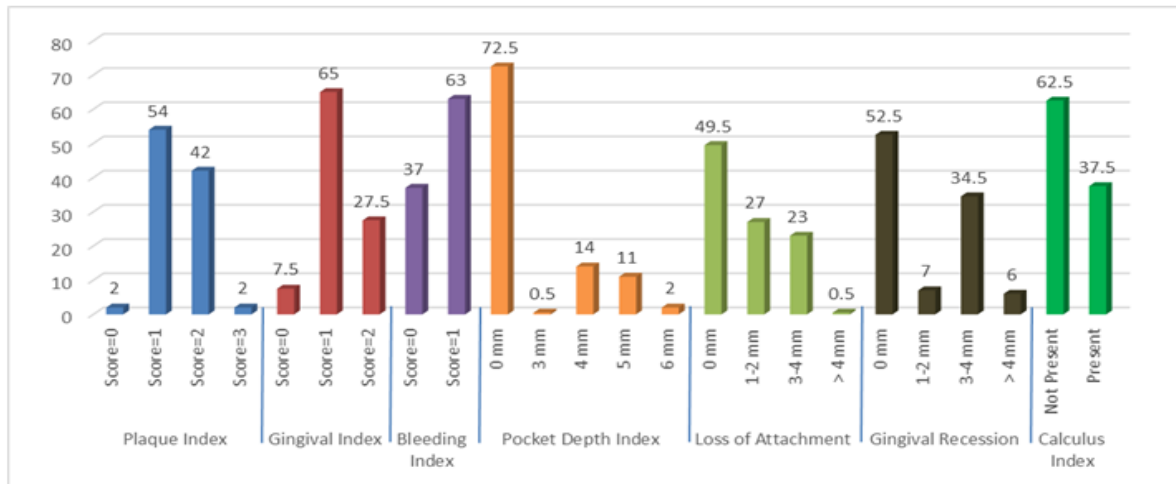


Figure 2: Distribution of the clinical recorded scores among the study sample (%)

Table 1: Distribution of teeth brushing and use of interdental aids by gender, study phase, and family income

		Teeth Brushing		Interdental Aids	
		No	Yes	No	Yes
Gender	Male	13.3%	86.7%	86.7%	13.3%
	Female	1.3%	98.8%	77.5%	22.5%
Sig.		0.001		0.68	
Study phase	1 <sup>st</sup>	12.5%	87.5%	80%	20%
	2 <sup>nd</sup>	10%	90%	87.5%	12.5%
	3 <sup>rd</sup>	5%	95%	85%	15%
	4 <sup>th</sup>	5%	95%	80%	20%
	5 <sup>th</sup>	10%	90%	82.5%	17.5%
Sig.		0.678		0.877	
Family income	Low	17.9%	82.1%	92.3%	7.7%
	Moderate	6.9%	93.1%	86.1%	13.9%
	High	0%	100%	35.3%	64.7%
Sig.		0.039		0.001	

Table 2: Distribution of recorded scores by self-administered questionnaire variables (%)

		Plaque Index				Gingival Index			Bleeding Index		Pocket Depth Index					Loss of Attachment				Gingival Recession				Calculus Index	
		0	1	2	3	0	1	2	0	1	0	3	4	5	6	0 mm	1-2 mm	3-4 mm	>4 mm	0 mm	1-2 mm	3-4 mm	>4 mm	0	1
Gender	Male	1.7%	42.5%	52.5%	3.3%	3.3%	55.8%	40.8%	30.8%	69.2%	64.2%	.8%	15.0%	16.7%	3.3%	32.5%	32.5%	34.2%	.8%	35.0%	10.0%	45.8%	9.2%	50.8%	49.2%
	Female	2.5%	71.3%	26.3%	0.0%	13.8%	78.8%	7.5%	46.2%	53.8%	85.0%	0.0%	12.5%	2.5%	0.0%	75.0%	18.8%	6.3%	0.0%	78.8%	2.5%	17.5%	1.3%	80.0%	20.0%
Sig.		0.001				0.001			0.02		0.004					0.001				0.001					
Study Phase	1 <sup>st</sup>	5.0%	60.0%	30.0%	5.0%	12.5%	65.0%	22.5%	47.5%	52.5%	62.5%	0.0%	17.5%	17.5%	2.5%	47.5%	27.5%	25.0%	0.0%	50.0%	10.0%	32.5%	7.5%	60.0%	40.0%
	2 <sup>nd</sup>	0.0%	37.5%	57.5%	5.0%	7.5%	60.0%	32.5%	35.0%	65.0%	57.5%	0.0%	17.5%	20.0%	5.0%	42.5%	22.5%	32.5%	2.5%	45.0%	2.5%	40.0%	12.5%	52.5%	47.5%
	3 <sup>rd</sup>	2.5%	62.5%	35.0%	0.0%	7.5%	82.5%	10.0%	47.5%	52.5%	87.5%	0.0%	10.0%	2.5%	0.0%	37.5%	42.5%	20.0%	0.0%	37.5%	7.5%	50.0%	5.0%	75.0%	25.0%
	4 <sup>th</sup>	2.5%	57.5%	40.0%	0.0%	10.0%	57.5%	32.5%	32.5%	67.5%	75.0%	0.0%	12.5%	10.0%	2.5%	67.5%	17.5%	15.0%	0.0%	75.0%	7.5%	15.0%	2.5%	57.5%	42.5%
	5 <sup>th</sup>	0.0%	52.5%	47.5%	0.0%	0.0%	60.0%	40.0%	22.5%	77.5%	80.0%	2.5%	12.5%	5.0%	0.0%	52.5%	25.0%	22.5%	0.0%	55.0%	7.5%	35.0%	2.5%	67.5%	32.5%
Sig.		0.154				0.059			0.099		0.194					0.171				0.066					
Family Income	Low	0.0%	41.0%	53.8%	5.1%	2.6%	59.0%	38.5%	25.6%	74.4%	56.4%	0.0%	12.8%	28.2%	2.6%	30.8%	30.8%	38.5%	0.0%	33.3%	7.7%	46.2%	12.8%	38.5%	61.5%
	Moderate	.7%	54.9%	43.1%	1.4%	4.9%	67.4%	27.8%	36.8%	63.2%	73.6%	.7%	16.0%	7.6%	2.1%	49.3%	28.5%	21.5%	7%	52.8%	7.6%	34.7%	4.9%	66.7%	33.3%
	High	17.6%	76.5%	5.9%	0.0%	41.2%	58.8%	0.0%	64.7%	35.3%	100.0%	0.0%	0.0%	0.0%	0.0%	94.1%	5.9%	0.0%	0.0%	94.1%	0.0%	5.9%	0.0%	82.4%	17.6%
Sig.		0.001				0.001			0.021		0.008					0.002				0.003					
Teeth brushing	No	0.0%	0.0%	76.5%	23.5%	0.0%	23.5%	76.5%	5.9%	94.1%	29.4%	0.0%	17.6%	41.2%	11.8%	23.5%	11.8%	64.7%	0.0%	29.4%	0.0%	58.8%	11.8%	5.9%	94.1%
	Yes	2.2%	59.0%	38.8%	0.0%	8.2%	68.9%	23.0%	39.9%	60.1%	76.5%	.5%	13.7%	8.2%	1.1%	51.9%	28.4%	19.1%	.5%	54.6%	7.7%	32.2%	5.5%	67.8%	32.2%
Sig.		0.001				0.001			0.003		0.001					0.001				0.06					
Interdental aids	No	0.0%	49.4%	48.2%	2.4%	2.4%	66.9%	30.7%	29.5%	70.5%	69.3%	.6%	15.7%	12.0%	2.4%	44.0%	30.7%	24.7%	.6%	47.0%	7.8%	39.2%	6.0%	57.2%	42.8%
	Yes	11.8%	76.5%	11.8%	0.0%	32.4%	55.9%	11.8%	73.5%	26.5%	88.2%	0.0%	5.9%	5.9%	0.0%	76.5%	8.8%	14.7%	0.0%	79.4%	2.9%	11.8%	5.9%	88.2%	11.8%
Sig.		0.001				0.001			0.003		0.255					0.006				0.005					

Table 3: Relationship between self-administered questionnaire variables with recorded scores

	Student Gender			Student's Class			Family Income			Brushing Teeth			Using of Interdental Aid							
	B	Sig.	95% CI	B	Sig.	95% CI	B	Sig.	95% CI	B	Sig.	95% CI	B	Sig.	95% CI					
Plaque Index	-.180	.017	-.327	-.033	.002	.931	-.046	.050	-.125	.088	-.268	.019	-.691	.000	-.941	-.441	-.379	.000	-.568	-.191
Gingival Index	-.302	.000	-.446	-.158	.058	.016	.011	.106	-.127	.077	-.267	.014	-.413	.001	-.658	-.168	-.349	.000	-.534	-.164
Bleeding Index	-.056	.416	-.192	.080	.057	.013	.012	.101	-.064	.340	-.196	.068	-.242	.040	-.472	-.011	-.382	.000	-.556	-.208
Pocket Depth Index	-.686	.018	-.1254	-.117	-.248	.010	-.434	-.061	-.484	.087	-.1039	.071	-.1888	.000	-.2855	-.921	-.352	.343	-.1081	.378
Loss of Attachment	-.615	.000	-.835	-.395	-.070	.059	-.142	.003	-.185	.092	-.400	.030	-.379	.047	-.754	-.004	-.223	.122	-.506	.060
Gingival Recession	-.778	.000	-.1062	-.494	-.112	.019	-.205	-.018	-.243	.085	-.520	.034	-.179	.466	-.662	.304	-.356	.055	-.721	.008
Calculus Index	-.192	.005	-.325	-.060	-.017	.440	-.061	.026	-.092	.160	-.221	.037	-.477	.000	-.702	-.251	-.192	.027	-.362	-.022