

*Original Article*

**Evaluation of Oral Hygiene Practices, Oral Health Status and Behaviours among Dental Students at Qassim University**

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**Abstract:**

**Objectives:** current study was carried out to evaluate the pattern and differences concerning oral health attitudes and behavior pattern between students studying in pre-clinics with higher class dental students in clinics at Qassim University.

**Method:** A cross-sectional study through survey in Qassim University dental clinics in 2020-2021, among dental students, All the 100 participants undergone a self-administered questionnaire survey followed by a dental checkup to access the dental health and oral hygiene status.

**Result:** Caries prevalence revealed a mean DMFT 5.99 teeth. The significant differences were found in mean of total DMFT score and its 'Decayed' component. Gingival index score was  $0.72 \pm 0.37$  which indicate good gingival condition. There's a highly statistically significant difference among the male when compared with female students ( $p > 0.001$ ). Plaque index score was  $0.92 \pm 0.33$ , 72% of the students had good oral hygiene. 86% reported they brush at least once a day. We observed significant difference from groups male to female groups ( $p = 0.001$ ). Flossing been adopted by 59% of students. Female students reported significantly higher frequencies ( $p = 0.005$ )

**Conclusions:** This study recommends the needs to have extensive program for the dental students from the beginning to enhance the selfcare behaviors and also the oral health status.

**Keywords:** Oral health, Oral hygiene, Dental care, Dental students

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**Introduction:**

Health behavior (HB) habits plays key role in maintaining the general and mental health. Steptoe and colleagues described is HB as 'the series of activities practiced by individuals to maintain, promote and protect health and keep away from disease' <sup>(1)</sup>. The various contributing factors that influences health at community and individual level are level of knowledge, values, beliefs, skills, attitudes, economic status, influence from coworkers, close family members, leaders, fellow students <sup>(2)</sup>. When we look at the Oral health (OH) it's the mirror of the general health, a good

oral health contributes for the persons to socialize without any fear and hesitation giving community well-being of the individual <sup>(3)</sup>. Poor OH can leads to adverse effects in general health. OH, habits measure the individual's knowledge and attitudes towards maintaining disease free oral environment. The two most common disease directly related to the poor oral hygiene are dental caries and the periodontal diseases. <sup>(4-8)</sup>. The passion towards maintaining the own OH will closely resulted in the level of the OH status in the health care workers which could limit the potentiality of quality of delivery to the patients about the oral health practices <sup>(9-20)</sup>.

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Dental students play a fundamental role in OH improvement either during their studying or when they graduate, they are supposed to be role models to their patient

There are very few reports on the level of OH attitudes and pattern of behaviors with dental students toward practicing a good OH in Saudi Arabia, as only two reports were published on group of students in Riyadh dental college and pharmacy <sup>(21)</sup>, and Jazan University <sup>(22)</sup>. On the other hand, no previous studies were conducted to measure the level concerning OH status involving dental students either in Qassim region or in Saudi Arabia as a whole. This study designed to measure the oral status among dental students in Qassim University and evaluate their practices and behaviors to oral hygiene.

## Materials and Methods:

### Study Design:

This present cross-sectional study performed using survey among Qassim University dental clinics during the academic year 2020-2021, among dental students of Qassim University. Ethically approved was granted by the Dental Research Center of Qassim University with the approval number #32/2013.

The target population comprised of one hundred dental students of undergraduate program (BDS) of Qassim University. 20 students have been randomly selected from each academic year (1st – 5th) in both males and females' sections. General purpose and organization of the study has been clarified to all participants.

All the participants undergone a self-administered questionnaire survey followed by a dental checkup to access the dental health and oral hygiene status.

### Clinical Examination:

Examination by 2 examiners; one for males and the other one for females. The examiners were calibrated under supervision of faculty members from College of Dentistry, Qassim University.

Each student has been received an examination for dental, plaque and gingival health. The examination tools using proper light, mouth mirror and explorer, additionally; calibrated periodontal probe (Williams' probe) for the Examination of the periodontium.

**DMFT:** Dental caries among the involved subjects recorded clinically with below given criteria of the affected number of teeth.

1. Decayed tooth(D)
2. Missing tooth resulting from caries (M)
3. Filled tooth(F)

For calculation of the DMFT score according to criteria propose by World Health Organization. (23)

Dental caries was detected visually at the apparent cavitation level and early caries not recorded.

**Plaque index:** Plaque index was recorded using the criteria set by Loe and Silness. (24) Using mouth mirror and William probe to examine 4 surfaces of teeth (Mesial, distal, buccal and lingual) giving the score from 0-3. The score was recorded from six index teeth (16, 12, 24, 36, 32 and 44).

The score criteria as following:

- 0 = No evidence of plaque
- 1 = Appearance of thin plaque film on free gingival margin and adhering to adjacent tooth surface, only noticed by application of disclosing agents and probe.
- 2 = Presence of accumulation moderate deposits around and involving gingival pocket, and also on adjacent teeth surfaces, which is visualized with naked eye.
- 3 = Presence of abundance of soft matter around and within the gingival pocket and/or around the tooth and gingival margin.

**Gingival Index:** Gingival index was recorded with criteria given by Loe and Silness. (25) Using mouth mirror and William probe to examine 4 surfaces (Mesial, distal, buccal and lingual) giving the score from 0-3. The score was recorded from six index teeth (16, 12, 24, 36, 32 and 44).

The score criteria as following:

- 0 = healthy gingiva or no clinical evidence of inflammation.
- 1 = Clinically mild signs of inflammation like noticeable color change, minimal edema, absence of bleeding while probing.

- 2 = Clinical signs of moderate inflammation, mild-moderate glazing, gingival redness, occurrence of bleeding while probing.
- 3 = Clinically obvious signs of Severe inflammation like severe gingival redness, hypertrophy, surface ulceration, severe tendency bleeding spontaneously after probing.

**Questionnaire:**

A well-structured, close ended self-administrable questionnaire was made with a google formed with printed sheet and distributed after the clinical examination.

The questionnaire consisted of the following:

1. Demographic data:
  - a. Academic level
  - b. Gender
2. Questions related to behavior's and practices:
  - a. Smoking status
  - b. Teeth brushing frequency, times and duration
  - c. Brushing techniques and movements
  - d. Toothbrush "types, bristle type and frequency of changing it"
  - e. Toothpaste fluoridation and the amount applied on toothbrush
  - f. Secondary methods used to clean teeth "mouth rinses, toothpick, Miswak, interdental brush, water irrigation device"
  - g. Frequency of using of dental floss
  - h. Tongue brushing
  - i. Time since last dental visit and the purpose of it
  - j. Check-up and oral prophylaxis frequency

**Statistical Analysis:**

The mean and resultant standard deviation of the data were calculated using t-test and also using Chi-square test and compared for overall differences between groups using SPSS v.21.0. Differences were statistically significant if p value <0.05.

**Results:**

Results were grouped into two categories of:

- Clinical Examination (caries prevalence, oral hygiene and gingival health)
- Questionnaire (oral health behaviours and practices).

**Clinical Examination:**

**Caries Prevalence:**

Table 1 demonstrates the mean DMFT index of our population. It revealed a mean DMFT 5.99 teeth with F 'Filled' component had the greatest value, which the mean of 'decayed' component was 2.37 teeth, the mean of 'missing' component was 0.26, and the mean of 'filled' one was 3.36 teeth. Within each student sample, there were statistical significant differences between students of both genders in mean of total DMFT score (p=0.011) and its 'Decayed' component (p=0.038).

	Mean ± SD		Independent Sample t- test	
	Male	Female	t	p-value
DMFT Index	4.88 ± 4.104	7.10 ± 4.482	- 2.583	0.011*
Decayed	1.80 ± 2.268	2.94 ± 3.080	- 2.108	0.038*
Missing	0.28 ± 0.73	0.24 ± 0.744	- 0.271	0.787
Filled	2.80 ± 3.464	3.92 ± 3.51	- 1.606	0.112

\*: Significant at p<0.05

**Gingival Health:**

The detailed clinical examination revealed, the overall mean gingival index were found to be 0.72 ± 0.37. There's a highly statistical significant amount of difference between the male and female students (p>0.001), which the score was significantly greater among the male students.

The difference between the academic year and the gingival condition wasn't statistically significant.

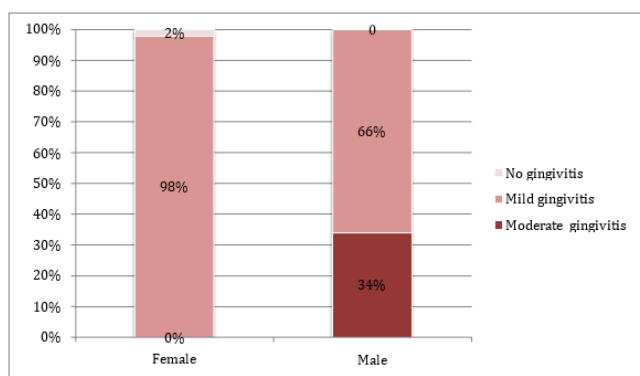


Figure 1

**Oral Hygiene:**

The observed mean value of plaque index of the students was  $0.92 \pm 0.33$  which majority (72%) belongs to good oral hygiene group, and 28% had fair oral hygiene group. The differences among academic years as well as between both genders weren't statistically significant.

**Questionnaire:**

**Oral Health Behaviours:**

The parentage of smoking, considered risk factors for periodontal disease, was (18%) of male students and absent in females. The difference in smoking habit involving male to female group students was found to be statistically significant ( $p=0.003$ , fisher's exact test).

A toothbrush with paste appears to be the most common oral hygiene tool used by dental students by (98%) of the students while only (2%) never brush their teeth. 67% of students were brushing two times or more daily, (19%) brushing once a day while (12%) are not brushing the teeth on their daily basis. There was significant statistical difference in teeth brushing habits among subjects in male to female group of students ( $p=0.001$ ).

Half of the students (50%) spent 1-2 min. in teeth brushing.

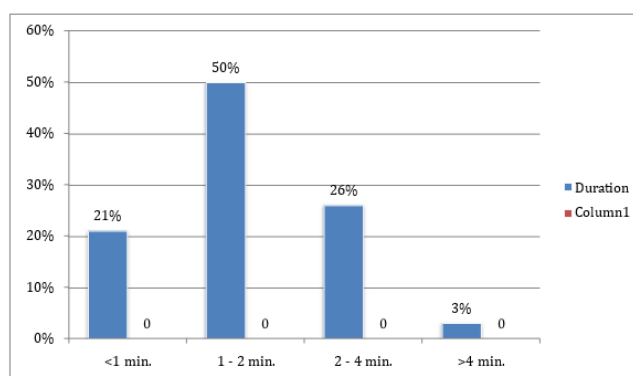


Figure 2

88% reported that they applied the toothpaste on half or less than half of the toothbrush. Similarly, a statistically significant difference ( $p=0.030$ ) was found among different academic years regarding the amount of toothpaste that applied on the toothbrush.

		Year				
		1st	2nd	3rd	4th	5th
Toothpaste Amount	less than half	4	6	13	10	12
	Half	10	12	6	9	6
	more than half	6	2	1	1	2

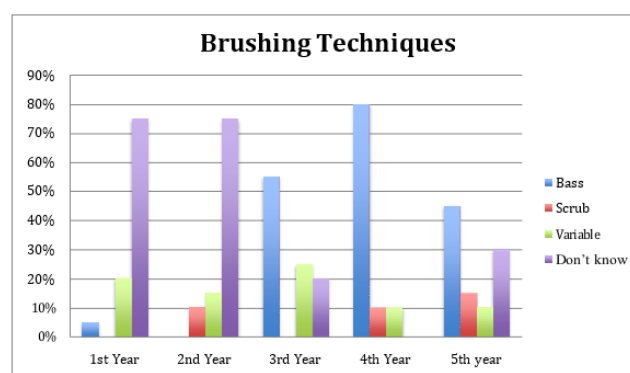
Majority of the students (89%) reported that they used the manual toothbrush only, 4% used electric tooth brush, and 7% used them both. 51% used medium toothbrush bristles, 46% used soft toothbrush bristles. There was significant statistical difference found between the male subjects to female subjects. ( $p=0.007$ ) regarding the bristle type they were using.

	Gender		Total	p-value
	Male	Female		
<b>Brushing</b>				
Duration <1 min.	9 (18%)	12 (24%)	21 (21%)	0.481
1-2 min.	23 (46%)	27 (54%)	50 (50%)	
2-4 min.	16 (32%)	10 (20%)	26	
>4 min.	2 (4%)	1 (2%)	3	
<b>Movements</b>				

Vertical	17 (34%)	20 (40%)	37 (37%)	0.394
Horizontal	7 (14%)	3 (6%)	10 (%)	
Combined	26 (52%)	27 (54%)	53	
<b>Techniques</b>				
Bass	16 (32%)	21 (42%)	37	0.051
Scrub	7 (14%)	0 (0%)	7	
Variables	8 (16%)	8 (16%)	8	
Don't know	19 (38%)	21 (42%)	40	
<b>Brush Type</b>				
Manual	42 (84%)	47 (94%)	89 (%)	0.109
Electric	4 (8%)	0 (0%)	4 (%)	
Both	4 (8%)	3 (6%)	7 (%)	
<b>Brush bristles</b>				
Soft	15	31	46	0.007 *
Medium	33	18	51	
Hard	1	1	2	
<b>Changing toothbrush</b>				
<3 months	12	6	18	0.423
3 months	15	19	34	
3-6 months	17	20	37	
>6 months	6	5	11	
<b>Toothpaste</b>				
Fluoridated				0.613
Yes	39	41	80	
No	7	4	11	
don't know	4	5	9	
<b>Amount on toothbrush</b>				
less than half	20	25	45	0.167
half	21	22	43	
more than half	9	3	12	

\* Significant at (p<0.05)

Regarding brushing techniques the students were using to brush their teeth, it was found that 40% reported that they don't know what the technique they are using is. While 37% of the students were using Modified Bass technique, with highly statistical significance difference in the used brushing techniques among the academic years (p<0.001). On the other hand, it was statistically not significant between both genders.

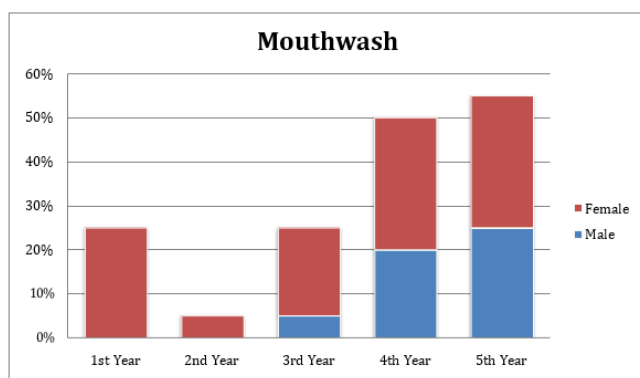


Regarding changing toothbrush, 52% reported that they replaced their toothbrush within 3 months, while 48% replaced it in over 3 months with no statistically significant difference between subjects in male and female group.

Majority of the students (80%) chose fluoride toothpaste, and 20% reported that they are uncertain

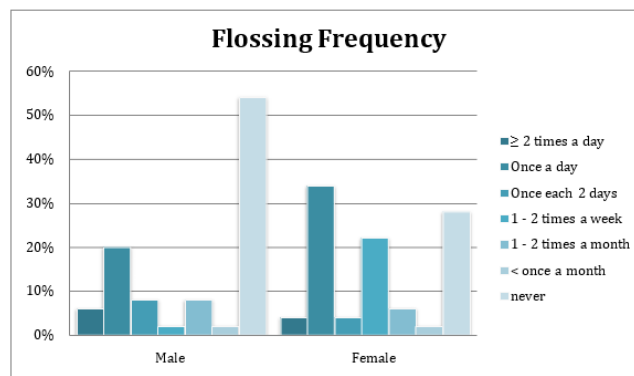
about type of toothpaste they are using. There was significant statistical difference among the academic years regarding use of fluoridated toothpaste ( $p=0.033$ ), which it increased in final years. While male and female students showed no statistically significant difference.

Most of the students (78%) used one or more means complementary to brushing, Mouthwash (32%), toothpick (29%), Miswak (28%) interdental brush (17%), water irrigation device (4%), and others (4%). We found significant statistical difference between subjects in male and female groups regarding use of Miswak ( $p=0.008$ ) as well as using of water irrigation device ( $p=0.04$ ).



Regarding the using of mouthwash, both gender and academic years showed statistical significant ( $p=0.01, 0.004$  respectively).

Flossing, as mostly used preventive method, was regularly used by more than 50% of subjects (59%), 32% reported that they flossed at least once a day. Female students adapted the flossing significantly higher frequencies ( $p=0.005$ ) when compared to male subjects. And the difference among the academic years was not statistically significant.



Regarding tongue brushing habit, 25% reported that they clean their tongues regularly, 25% occasionally, 29% rarely, and 21% were not brushing their tongues at all. There exists statistically significant when compared among the academic years ( $p=0.048$ ). And the difference between male and female students were not statistically significant.

For students' dental visit behaviours, most of the students (74%) visited the dentist during the last year, while 21% reported that their last visit was in more than year ago, and only 5% of the students said they never visited dental clinic for their dental problem. Again, there was significant statistical difference among male subjects female subjects ( $p=0.01$ ).

More than half of the students (58%) have visited the dentist to seek treatment/because they felt pain, while 24% visited the dentist for preventive purpose and examination, and 16% reported that they were going for regular check up. The difference was statistically significant among the academic years ( $p=0.006$ ).

In the asking about check up behaviour (For check up frequency), 38% of the students reported that they are going only in problem, 22% every year, 19% each 6 months, and 14% have not gone before.

Regarding going to the dentist for prophylaxis purpose, 40% of the students reported that they are going in one year or more, 38% never gone before, and 22% in 6 months or less. There was significant statistical difference among the academic years students regarding check up frequency ( $p=0.000$ ) and prophylaxis (0.006).  $\geq$

The differences among the male and female students were statistically not significant in both check up and prophylaxis behaviours.

### **Discussion:**

Clarifying and educating the patients concerning the most appropriate oral care and enhancing their level of perception to maintain OH and stay away from oral diseases is a must require qualities for oral health workers<sup>(23-26)</sup>. Today's dental students are already beginning with the clinical practice from the third-year of graduate programme, it's advisable maintain and practice the most efficient OH behavior AND attitudes during the undergraduate period so that they can pass the information to their patients to achieve the goal.

Our present study conducted to measure the oral status among dental students of Qassim University and evaluate their practices and behaviours related to oral care.

In the current study, the clinical examination revealed that there is significant difference between students of both genders in the mean DMFT index, the higher 'filled' statistic can be seen as a positive aspect suggestive of their better access to dental care. [Table 1]

Also, a statistically significant value of difference was found in mean gingival index between male and female group of students which the score was significantly greater among the male students [figure1]. The resultant mean plaque index in the students was  $0.92 \pm 0.33$  which majority (72%) demonstrated good oral hygiene and 28% had fair oral hygiene. The differences among academic years as well as between both genders weren't statistically significant.

The observed frequency of practicing twice a day brushing in our subjects were low 67% in comparison with to their counterparts in the Mongolia group of students 81%<sup>(27)</sup>, France 78%<sup>(28)</sup>, and Australia 80%<sup>(29)</sup> While in our group reported 80% of the students uses fluoridated toothpastes which is higher than the data presented by Iran<sup>(30)</sup> and Mongolia<sup>(27)</sup>.

Regarding reports of oral self-habits, it was found differences between male and female groups which includes; brushing the teeth, using toothpaste with fluorides and dental flossing, were significantly high.

This observation is in agreement with data observed by people of Lay<sup>(31, 32)</sup> and among dental students in all phases of their programme<sup>(33, 34)</sup>.

Current study revealed 18% of male group were practicing smoking. This data closely resembles with data obtained from Turkish dental students 22%<sup>(35)</sup>. However, it was higher among Greece dental students 47% followed by Serbia study 43%, Hungary report 34%, France dental students 33% and Italy %33 which has been conducted and reported by among international groups of dental students for tobacco smoking including 19 countries<sup>(36-39)</sup>

Report by Howat et al.<sup>(40)</sup> pointed that oral care levels of students joined dental graduation programme improved as the students promote from the preclinical class to clinicals along the course of study, strongly noticed improvements and better OH habits than preclinical students group probably due to increased level of oral health education and clinical exposure in clinical students groups.

The current study highlighted the OH attitudes and pattern of behaviors towards OH among Qassim University dental students, KSA. Recommends A elaborated study involving larger group in deferent interval with extended programme and evaluation of the same students may help in the reaching the goal of good oral health for all.

### **Conclusion:**

Qassim University dental students reported good oral hygiene and well-practiced attitudes to OH, Furthermore, it concludes the level of practicing OH attitudes and pattern of behavior towards good OH among dental students has increased with level graduate programme and clinical exposure. Clinical students have proved better attitudes when compared to the pre-clinical students, hence this study strongly suggested to implement dental health care programs

and workshop in early periods of dental education programme.

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