Research Paper: The oral health status and oral hygiene practice of senior dental students: A cross-sectional study

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ABSTRACT

Introduction: Oral and dental problems still remain a public health dilemma worldwide. The aim of this study was to investigate the oral health status and oral hygiene practice of dental students.

Materials and Methods: 80 senior dental students were assigned to the study by using convenience sampling technique. A questionnaire was used to collect the information, which included two sections. The first section asked for demographic information and the second section asked for oral hygiene practice, and was completed by the participants. The reliability of the questionnaire was assessed by the test-retest method and the kappa value was calculated to be 0.65-0.91. The DMFT index was also recorded by clinical examination. The data were analyzed by SPSS software version 20 at the significance level of 0.05.

Results: In this study, more female participants brushed the lingual and palatal surface of their teeth compared to males; more male participants experienced gingival bleeding during toothbrushing compared to females; more female participants used chlorhexidine mouthwash compared to males. The mean score of oral health status and oral hygiene practice was good (10.61±3.29). The mean score was good in females (11.27±4.68) and was moderate in males (9.83±1.81). A significant difference was found between females and males in terms of oral health status. Although the means of decay, missing and filling were higher in males than females, no significant relation was found between males and females in term of decay, missing and filling. (P=0.57, P=0.88m and P=0.23)

Conclusion: The findings indicated a relatively good oral health status and oral hygiene practice of dental students in Rasht city. The oral health status and oral hygiene practice of female students were better than males.

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Introduction

Oral health is an important aspect of general health. Nonetheless, oral and dental conditions are still among the most common problems adversely affecting the public health worldwide (1). Dental caries and periodontal disease are multifactorial public health dilemmas in developing countries, and are the most common causes of tooth loss (2). Dental caries is a microbial disease of the calcified tooth structure, characterized by demineralization of the inorganic part of the tooth and destruction of its organic content (3). The prevalence of oral and dental conditions is high; thus, oral hygiene and dental care are imperative (2). On the other hand, microorganisms can access other parts of the human body via the oral cavity. Thus, poor oral hygiene can negatively affect general health (4).

The prevalence of dental caries has decreased in the past decade; however, it is still a public health dilemma in developing countries and some developed countries. The decayed, missing, and filled teeth (DMFT) index is among the best indices to assess the oral health status of a population. Presence of pathogens, nutritional regimen, socioeconomic status, dental anomalies, occupational and living environments, and use of fluoridated water can all affect the susceptibility of individuals to dental caries(4-6).

Dental students, as the future dentists, have the social responsibility to serve as a role model in terms of oral health and oral hygiene for the community and particularly for their patients(5-6). A previous study showed significant differences between the oral health and oral hygiene behavior of dental students and a control group in different countries and cultures(5). Thus, this study aimed to assess the oral health status and oral hygiene practice of senior dental students.

Materials and Methods

This cross-sectional study evaluated 80 senior dental students of the School of Dentistry, Guilan University of Medical Sciences.

Methodology

This study was conducted after obtaining approval from the ethics committee of Guilan University of Medical Sciences.(ir.gums.rec.1398.141) The objectives of the study were explained to the participants and a written consent was obtained. The participants were ensured about the confidentiality of their information.

Sample size calculation

To determine the sample size, the floss use variable from study Rahman et al. has been used. The sample size formula for estimating the ratio in a community was used. Considering the ratio of 0.56, error level of 0.05 and d = 0.12, the minimum sample size was calculated to be 55. Considering the possible fall out of samples, 80 students participated in this study.

$$n_0 = \frac{\left(z_{1-\frac{\alpha}{2}}\right)^2 \cdot p(1-p)}{(d)^2} = \frac{(1.96)^2 \cdot 0.56(1-0.56)}{(0.12)^2} = 65.73 \sim= 66$$

$$n = \frac{n_0}{1+\frac{n_0}{(N)}} = \frac{66}{1+\frac{66}{320}} = 54.54 \sim= 55$$

Inclusion and exclusion criteria

80 dental students of 11th and 12th semesters were randomly assigned to the study using convenience sampling technique if willing to participate; had at least 20 teeth; and were not smokers. The participants were excluded from the study if they were not willing to participate further; and if the questionnaire was not completely filled.

A questionnaire was used to collect the data, which included two sections. The first section was a demographic section including age and gender. The second section included questions about oral health status and oral hygiene practice as following; daily tooth brushing(0= no, and 1= yes), frequency of tooth brushing per day(0= none, 1= once, 2= twice, 3= three times per day, 4= more than 3 times per day), 2 to 3 minutes tooth brushing(0= no, and 1= yes), brushing the lingual and palatal surfaces of the teeth(0= no, and 1= yes), gingival bleeding during tooth brushing(0= yes, and 1= no), time of changing the toothbrush(0= over 1 year, 1= six to 12 months, 2= three to six months, and 3= less than three months), use of dental floss or toothpicks (0= no, and 1= yes), use of chlorhexidine mouthwash(0= no, and 1= yes), use of tongue cleaners or toothbrush to clean the tongue(0= no, and 1= yes), impaired social life due to bad breath(0=

yes, and 1= no) and history of dental visits(0= never, 1= over a year, and 2= less than a year).

The total score of oral health status and oral hygiene practice was calculated by summing the score of each question. The score varied from 0 to 16. The oral health status and oral hygiene practice was categorized as poor if the score was from 0 to 5, as moderate if the score was more than 5 to 10, as good if the score was more than 10 to 15, and as excellent if the score was 16.

The DMFT index of students was also calculated by one of the researchers in an adequately lit room by using a spotlight, a dental explorer (sickle probe) and a dental mirror. A tooth with visible enamel caries that was completely soft when examined with the tip of an explorer or the tip of the explorer was engaged in the lesion was considered carious and recorded as a decayed tooth. For teeth covered with dental plaque, first the tooth would be cleaned with a sterile gauze and then it would be examined for caries. Restored teeth with evidence of secondary caries were also recorded as carious. Permanent teeth that had been extracted due to caries were recorded as missing. Teeth with permanent restorations and no evidence of caries recurrence were recorded as filled teeth. In order to calculate the DMFT index, the number of decayed, missing and filled teeth was counted and the mean value was recorded(6).

Validity and reliability of the questionnaire:

In order to determine the scientific validity of the researcher-designed questionnaire, it was evaluated by 10 faculty members of the School of Dentistry, Guilan University of Medical Sciences, and the questionnaire was modified based on their expert opinions. According to Content Validity Ratio(CVR) index, only 11 questions satisfied the significance level(by Lavashe table (CVR≥0.6)) and the rest were removed. Based on Content Validity Index(CVI) index, all the remaining questions survived(CVI higher than 0.90). The reliability of the questionnaire was assessed by the test-retest method, such that the questionnaire was administered among 40 dental students and was retested after 2 weeks; the kappa value was calculated to be 0.65-0.91.

Statistical analysis

Data were analyzed using SPSS(IBM Corp, Armonk, NY, USA) version 20. Descriptive statistics including frequency, frequency percentage, mean, and standard deviation were calculated. Inferential statistical tests such as independent sample t-test and Chi-square test were also applied. P<0.05 was considered statistically significant.

Results

The questionnaires of 60 students were analyzed and the data of 20 students were excluded as their questionnaires were not complete. The mean age of dental students was 25.33± 0.83 years. 38.03% (23) of participants was males and 61.07% (37) were females.

All dental students reported daily toothbrushing; the difference in this respect was not significant between male and female students (P= 0.06). The frequency of toothbrushing was once a day in 20% (12), twice a day in 61.66% (37), and three times a day in 18.33% (11). No participants brushed their teeth more than 3 times a day. The difference in this respect was not significant between male and female students (P=0.09).

Of all, 66.66% (40) reported the duration of toothbrushing to be 2-3 min while 33.34% (20) reported toothbrushing for less than 2-3 min. The difference in this respect was not significant between males and females(P=0.06).

Of all, 88.33% (53) reported brushing the lingual and palatal surfaces of their teeth. 11.6% (7) of participants did not brushed the lingual and palatal surfaces of their teeth. The difference in this respect was significant between males and females(P=0.03). So that, more female participants brushed the lingual and palatal surface of their teeth compared to males.

Also, 38.33% (23) reported no gingival bleeding during toothbrushing. While 61.67% (37) of participants experienced bleeding during toothbrushing. The difference in this respect was significant between males and females(P=0.02). So that, more male participants experienced gingival bleeding

during toothbrushing compared to females.

Of all, 20% (12) reported changing their toothbrush in less than 3-month intervals and 80% (48) changed their toothbrush in 3 to 6-moth intervals. The difference in this respect was not significant between males and females (P=0.11).

Of all, 66.66% (40) reported dental flossing or using toothpicks and 33.34% (20) did not use dental floss or toothpicks. The difference in this regard was significant between males and females (P=0.04). So that, more females used dental floss and toothpicks compared to males.

Moreover, 18.33% (11) reported using chlorhexidine mouthwash while 81.67% (49) of participants did not use chlorhexidine mouthwash. The difference in this respect was significant between males and females as well(P=0.04). So that, more female participants used chlorhexidine mouthwash compared to males.

Also, 100% (60) of students reported using tongue cleaners or a toothbrush to clean their tongue. The difference in this regard was not significant between males and females either (P=0.06). None of the students reported problems in their social life due to bad breath. The difference in this respect was not significant between males and females(P=0.14).

Of all, 20% (12) had never visited a dentist, 65% (40) had visited a dentist longer than 12 months ago, and 15% (8) had visited a dentist in the past 12 months. The difference in dental visits was not significant between males and females (P=0.24).

The mean score of oral health status and oral hygiene practice was good(10.61± 3.29). The mean score was good in females(11.27± 4.68) and was moderate in males(9.83± 1.81). 11.66% (7) of the participants had poor oral hygiene; 21.66% (13) had moderate oral hygiene; 66.66% (40) had good oral hygiene; and none had excellent oral hygiene.(Table 1) A significant difference was found between females and males in terms of oral health status.(P=0.03)

The mean DMFT score of students was 2.31± 1.56; this value was 1.13±0.93 in females and 1.21± 0.71 in males. The difference in DMFT was not significant between males and females

(P>0.05).

Table 1. Oral health status in females and males in percent (number)

Gender	Poor	Moderate	Good	Excellent
Females	8.1% (3)	16.21 (6)	75.67% (28)	0% (0)
Males	17.39% (4)	30.43% (7)	52.17% (12)	0% (0)
Total	11.66% (7)	21.66% (13)	66.66% (40)	0% (0)

The mean score of decay, missing and filling is presented in table 2. No significant difference was found among decay, missing and filling in females(P=0.87) and in males(P=0.81). Although the means of decay, missing and filling were higher in males than females, no significant relation was found between males and females in term of decay, missing and filling. (P=0.57, P=0.88m and P=0.23)

Table 2. The mean and standard deviation of decay, missing, filling and DMFT in females and males

Gender	Decay	Missing	Filling	DMFT score
Females	0.37±0.78	0.39±0.61	0.37±0.12	1.13 ±0.93
Males	0.41±0.06	0.4±0.29	0.43±0.14	1.21±0.71
Total	0.77±0.58	0.78±0.74	0.79±0.18	2.31±1.56

Discussion

The current study assessed the oral health and oral hygiene practice of dental students. The results showed that female students brushed their palatal/lingual surface of their teeth, flossed their teeth and use chlorhexidine mouthwash more commonly than male students, and experienced gingival bleeding less frequently compared to male students. The overall oral health of females was good while the oral health of males was moderate. This finding was in agreement with the results of Al-Hussaini et al., (5) Al-Omari et al., (7) Al-Ansari et al., (8) Poorhashemi et al., (9) and Peker et al. (10).

Al-Hussaini et al. (5) assessed the oral health awareness of 410 students in Kuwait University Health Sciences Centre. They reported that female students were more aware and concerned about dental health issues. Al-Omari et al(7). evaluated the difference in oral health attitude and behavior of dental students in Jordan and reported that although the overall oral

hygiene of participants was poor, the attitude and behavior of female students were better than males. Al-Ansari et al(8). evaluated the oral health knowledge and behavior of health science students and claimed that female students were more engaged in dental behavior than male students and had better knowledge in this field. Poorhashemi et al(9). questioned the knowledge of health system personnel about oral and dental health and found that the female personnel had better knowledge than male personnel. However, Muthu et al(11). found no significant difference in this respect between male and female dental students.

Dental students, as future dentists, have a social responsibility and should be a role model with regard to oral health and oral hygiene for their community and particularly their patients (12) and must invest on their oral health(13). A previous study showed significant differences between the oral health and oral hygiene behavior of dental students and a control group in different countries and cultures(12). The current results revealed relatively good status of dental students with regard to toothbrushing, its frequency and duration, dental flossing, use of mouthwash, dental visits (particularly scheduled visits), and absence of social problems due to bad breath. Moreover, the performance of female students was superior to that of male students, which was in line with previous findings.

Comprehensive programs are required aiming to promote the oral health knowledge and practice of dental students from the onset of their education(14). Moreover, dental students should be encouraged to serve as a role model in terms of oral health for their family, friends and patients. Prevention should be prioritized to treatment to promote oral health in a community (15-16), and the first step in this respect is to enhance the oral health knowledge and attitude of the public by continuous health education programs (17). Improving the public knowledge and attitude about oral health can help in preservation of teeth and their supporting structures. According to the World Health Organization

standards regarding an ideal DMFT score to be < 1, knowledge about the dental status and treatment needs of males and females of different age groups is among the most important factors in strategy planning for oral hygiene programs. Also, courses regarding the principles of oral hygiene should be included in the educational curricula of schools and universities and considered by the Ministry of Health and Medical Education and the Ministry of Education.

Limitation and suggestion

This study assessed the oral health status of senior dental students, which limits the generalization of results to other students. Use of a self-reported questionnaire, which creates a bias in responding to questions, convenience sampling, which creates a bias in random selection of individuals and is associated with lower internal and external validity, and descriptive study design, which does not reveal cause-and-effective relationship between the variables were among the limitations of this study. For future studies, it is suggested to measure the gingival index to determine the oral health and assess its relation with DMFT.

Conclusion

The findings indicated a relatively good oral health status and oral hygiene practice of dental students in Rasht city. The oral health status and oral hygiene practice of female students were better than males.

Authors'contributions

Bardia Vadiati: Conceptualization, Methodology, Writing - Review & Editing **Maedeh Afravi:** Writing - Original Draft, Data Curation, Supervision **Dorsa Rahi:** Resources, Investigation, Visualization

Conflict of Interests

The authors declare no conflict of interest.

Ethical declarations

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