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Original article

Evaluation of Gingival Bleeding Awareness Among Dental Students at University of Tripoli

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ABSTRACT

Background and objectives. *Bleeding of the gingiva is considered as an early sign of gingival inflammation and periodontal destruction. Bleeding on probing is used by clinicians to measure the prevalence and progression of periodontal disease, evaluate treatment outcome, and motivate patients to perform regular professional home care. The aims of this study were to assess self-experience gingival bleeding and to determine the oral health attitude and behavior among Libyan dental students.* ***Methods***. *About 230 undergraduate dental students were given a questionnaire administered by three investigators after taking verbal consent. The answers of the filled questionnaires have been collected within 30 days and analyzed through SPSS version 25.* ***Results***. *A total of 220 students answered the questionnaire and the frequency of gingival bleeding during tooth brushing were (55.0%) of students rarely experience gingival bleeding, twenty-nine participants (13.2%) frequently practiced gingival bleeding, and nearly one third (70, 31.8%) of students conveyed no bleeding. More than 72% of the students answered that smoking might increase gingival bleeding. Regarding mechanical stimuli, tooth brushing was considered by 77.7% of students as the main cause of gingival bleeding. Along with 18.7% have bleeding while eating hard food. Furthermore, only 3.6% of the study sample have early morning gingival bleeding. After bleeding, 33.2% of students visited the dentist whereas 23.6% of students stopped tooth brushing.* ***Conclusions***. *Knowledge and awareness concerning cause of gingival bleeding is still poor among Libyan dental students. Furthermore, many responses of these students were inappropriate or not optimal regarding the management of the gingival bleeding. Therefore, more dental health education is needed to improve oral health and prevent periodontal disease.*

Keywords: Periodontal Disease, Gingival Bleeding, Dental Student, Student Knowledge.

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INTRODUCTION

Gingival inflammation that is associated with bacterial plaque accumulation is the most common form of gingival disease [1]. Gingivitis may develop to periodontitis and eventually ends up with tooth loss. Untreated gingivitis can also persist over time with variation in intensity. With treatment gingivitis is completely reversible [2]. Gingivitis presents with specific clinical features such as redness and edematous of the gingival tissue, bleeding upon probing, changes in contour and the presence of calculus or plaque with no radiographic evidence of crestal bone loss [3]. Bleeding on probing (BOP) has been accepted as the gold standard for clinical

assessment of gingival inflammation [4]. Bleeding on probing (BOP) is easily detected clinically and therefore is of value for early diagnosis and for prevention of more advanced gingivitis. BOP is considered one of the earliest sings of gingival inflammation and appears earlier than a change in color or other visual signs of inflammation [5-7]. The use of bleeding provides additional advantageous to diagnose early gingival inflammation by being a more objective sign that requires less subjective estimation by the examiner [8]. The most common cause of abnormal gingival bleeding on probing is chronic inflammation [9]. The bleeding is chronic or recurrent, and it is provoked by mechanical trauma (e.g., tooth brushing, toothpicks, and food impaction) or by biting into solid foods (e.g., apples). Both diabetes and nutritional deficiency increase gingivitis in association with dental plaque biofilm accumulation [10]. However, the chronic smokers have less gingival bleeding than a non-smoker, which hidden the clinical markers often used by dentists to monitor periodontal health [11]. The severity of bleeding and the ease of its provocation depend on the intensity of inflammation. In cases of moderate or advanced periodontitis the presence of BOP is considered a sign of active tissue destruction [12].

METHODS

A survey questionnaire was designed, introduced and explained to dental students of faculty of Dentistry, University of Tripoli in May 2022. Permission to carry out the study was obtained and approved by the scientific committee of faculty of Dentistry, University of Tripoli. The questionnaire form included most relevant questions on gingival bleeding.

In brief, the questionnaire which consists of 11 questions includes items related to periodontal experience and knowledge was distributed to students of each class in their lecture halls. While the questionnaires were being completed, the investigators were available to answer and explain any question that the students put forward. Students were reassured that the data would be kept back private. The questionnaire took 10-15 minutes to be completed by the majority of the students. Questionnaire was made by reviewing the literature and then were modifying to fit local requirements. Pilot study was carried out and essential changes were made for that reason.

Data management and Statistical analysis

The collected data were sorted, coded then entered and analyzed using the SPSS, version 25.0 statistical software. Parametric data were expressed as means, standard deviations, while non- parametric data were expressed as numbers and percentages.

RESULTS

Characteristics of Study Participants

A total of 230 questionnaires were distributed over the two months' study period, and 220 of them were completed, giving a response rate of 95.6%. There were (122, 55.5 %) females and (98, 44.5%) males. The age ranged from 18 to 26 years old, with a mean of 22.32 years±1.75 SD. The students were divided into four academic years: (43, 19.5%) in their first year, (45, 20.5%) in their second year, (33, 15.0%) in their third year, and (99, 45%) in their fourth year.

In terms of oral hygiene, nearly two-thirds (143, 65%) of the students brushed their teeth twice a day; while (36, 16.4%) brushed their teeth three or more times per day; about thirty-three (15%) brushed their teeth once a day; and only eight students (3.6%) brushed their teeth less than once a day. Only seventeen students (7.7%) used dental floss twice a day; While (93, 42.3%) of the students used it once, and approximately (110, 50.0%) of the students did not use it at all. Their characteristics were as shown in (table 1).

Basic knowledge of the students toward gingival bleeding

Table 2 shows that the majority of students (210, 95.5%) correctly recognized pink as the typical color of normal gingiva, while just (9, 4.1%) incorrectly identified red, and one student incorrectly selected brown as the typical color of healthy gingival. More than a quarter of students (60, 27.3%) were aware that microbial infection is the primary cause of gingival bleeding. However, other students stated

that gingival disease itself (140, 63.6%), systemic illness (11, 5%), and family inheritance (9, 4.1%) were the other substantial causes of gingival bleeding. Only (60, 27.3%) of students knew that smoking might not cause gingival bleeding, while nearly three-quarters (160, 72.7%) thought it might be a cause for gingival bleeding

Regarding to the gingival condition of the student, the presence of gingival bleeding, and the student's management of this inflamed gingiva

As shown in table 3, in terms of the gingival condition of students, over three-quarters of the students (170, 77.3%) indicated that their gingiva was in good health whereas forty-four students (19%) indicated their gingiva was fair health; and only six students indicated a bad condition. Nearly one-thirds of students (69, 31.4%) mentioned that their gingiva was reddish or swollen, compared to (151, 68.6%) who did not.

Regarding gingival bleeding during tooth brushing, it was reported that over half (121, 55.0%) of students rarely experienced gingival bleeding, twenty-nine participants (13.2%) frequently practiced gingival bleeding, and nearly one third (70, 31.8%) of students conveyed no bleeding.

According to our findings in figure 1, (96, 43.6%) of students used deep tooth cleaning, (124, 56.4%). The vast majority of students (171, 77.7%) believed that brushing their teeth made them more susceptible to gingival bleeding. Less than one quarter respondent 41, 18.7% indicated that people who eat hard are more prone to morning bleeding. Only eight students (8, 3.6%) who answered this question reported that morning bleeding lead to morning bleeding.

As a vital step in preventing bleeding gingiva, (84, 38.2%) of the students recommended using mouthwash and toothpaste, while (73, 33.2%) of them preferred to visit the dentist. About less than a quarter of the students (52, 23.6%) replied that they should stop brushing their teeth, and eleven students (5%) reported that they should increase the frequency of brushing.

Table 1. Characteristics of Study Participants (N=220)

Variable		Frequency	Percentage
Age, Mean ± SD (years)		22.32 years ± 1.75	
Gender	Male	98	44.5
	Female	122	55.5
Graduation level	First year	43	19.5
	Second year	45	20.5
	Third year	33	15.0
	Fourth year	99	45.0
How many times a day do you brush your teeth?	Less than once a day	8	3.6
	Once daily	33	15.0
	Twice a day	143	65.0
	Three or more times	36	16.4
How many times a day do you use dental floss?	I don't use	110	50.0
	Once a day	93	42.3
	Twice a day	17	7.7

Table 2. Frequency of various responses to knowledge questions toward gingival bleeding.

Question		Frequency	Percentage
What is the normal color of gingiva?	Pink	210	95.5
	Red	9	4.1
	Brown	1	0.5
Causes of gingival bleeding?	Microbial	60	27.3
	Systemic disease	11	5.0
	Gingival disease	140	63.6
	Family inheritable	9	4.1
Do you think that smoking might increase gingival bleeding?	Yes	160	72.7
	No	60	27.3

Table 3. The frequency of various responses to the gingival condition of the students, the presence of gingival bleeding (N=220).

Questions		Frequency	Percentage
How would you rate your gingival health?	Good	170	77.3
	Fair	44	19.0
	Bad	6	2.7
Have you seen your gingiva reddish or swollen	Yes	69	31.4
	No	151	68.6
Have you got gingival bleeding during tooth brushing?	Frequent	29	13.2
	Sometimes	121	55.0
	No bleeding	70	31.8

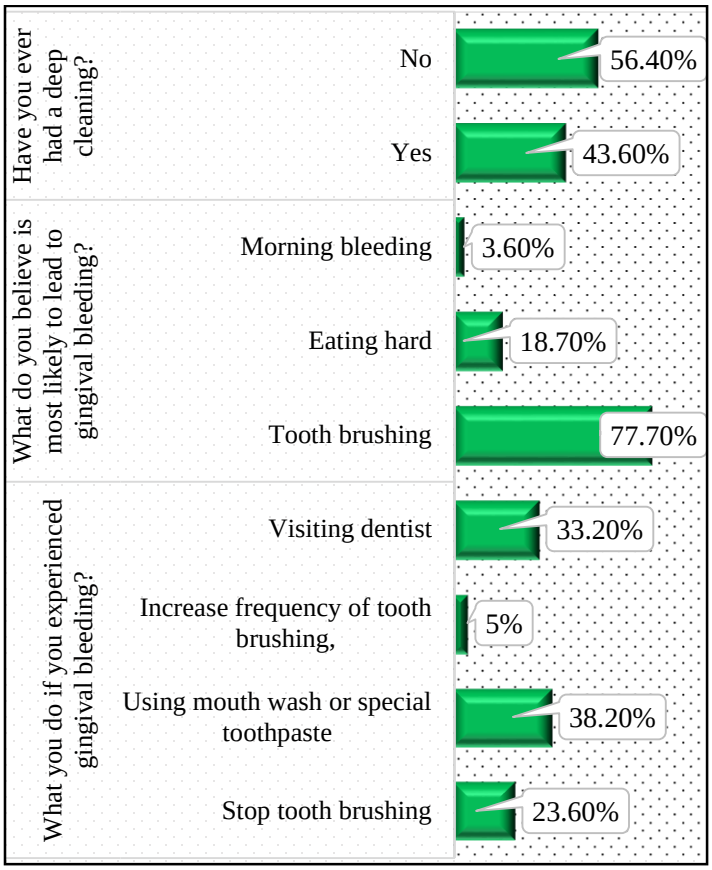

Figure 1. The frequency of various responses of participants deals with inflamed gingiva

DISCUSSION

Periodontal disease is one of the most common oral diseases that causes global burden. It is highly prevalent and considered as major public health problem in several countries.

There is a little or no available data concerning oral health knowledge and practice in dental student in Libya, this study has been focused on questions which help to reflect the gingival health status of dental students at University of Tripoli and to evaluate their awareness toward gingival bleeding and their knowledge about the etiology and management of gingival bleeding.

The color of the healthy gingiva is pale pink and the change in the color may be affected by the vascular supply, the thickness of the epithelium and the degree of keratinization, as well as the presence of melanin pigmentation [13]. In the current study, almost 95.5% of the participated dental students answered correctly in the question concerning the normal color of the healthy gingiva is pink, but only (27.3%) of the students answered correctly in the question concerning the cause of gingival bleeding which was due to the presence of bacteria in the plaque biofilm (microbial).

Smoking can decrease the signs of gingival inflammation and increase the prevalence and the severity of periodontal destruction [14]. The majority of the dental students (72.2%) in the present study thought that smoking increase gingival bleeding and this was incorrect.

The American Dental Association (ADA) recommends that individuals should brush twice per day and use floss or other interdental cleaners once per day to effectively remove microbial plaque biofilms and prevent gingivitis [15]. In the current study high frequency 65% of the dental students were using tooth brush twice daily, which was in accordance with other studies conducted in Turkey 68% and Islamabad 74% dental students [16-17]. From the other hand, only 3.6% of the students brushed their teeth once a day

Dental floss considered to be as the most widely used interdental cleaning aids to remove the inter proximal plaque biofilm [13]. In this study, (50%) of the dental students reported using dental floss

similar to 56% Emirates dental students [18], while in other countries the use of dental floss was very low; 3% in Turkish dental students [16] and 7.3% Nigerian dental students [19].

Bleeding of the gingiva is the first sign of gingival inflammation [13]. The present study demonstrated that13.2 % of the dental students have reported gingival bleeding frequently during tooth brushing, this finding was similar to the reported frequency of 15.7% in Iraq dental students [20]. 55% of the dental students in the present study experienced gingival bleeding only sometimes.

In the current study, 43.6% of the dental students have visited dentist for deep cleaning, and this percentage were in accordance with the number of the students experienced gingival bleeding.

Regarding the consistency of the gingiva two third 68.6% of the dental students did not feel the gingiva swell or red and only 31.4% of the dental students felt their gingiva swell or red. These results were in line with 77.3% of the dental students whom rated their gingival health as good in the present questionnaire.

In this study, only 33.2% of the students answered that they may visit the dentist if they experience gingival bleeding, this is a very small proportion which indicate that the students don't know the importance of visiting dentist for maintaining agood oral health. 38.25% preferred to use mouthwash or special toothpaste and 23.6% prefer to stop toot brushing, 5% prefer to increase the frequency of tooth brushing.

CONCLUSION

Oral health attitude and behavior should be increased among dental students and educational programs are recommended. Further clinical research is recommended to assess the prevalence of gingival bleeding among dental students and to compare between the clinical and preclinical students by dividing them into groups according to the grades (1^{st}, 2^{nd}, 3^{rd}, 4^{th} years of dental education).

Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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