# Self-Reporting Questionnaire on Gingival Bleeding Among Dental Students at University of Sulaimani

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## Abstract

**Objective:** Gingival bleeding during tooth brushing and eating is a clinical sign of gingivitis and periodontitis, or infrequently due to some associated systemic conditions or diseases such as vitamin C deficiency and blood diseases. Periodontal diseases are the six most prevalent conditions affecting human kind that are associated with plaque. The aims of this study were to determine self-experience gingival bleeding among dental students and their knowledge toward etiology, pathogenesis and management of gingival bleeding.

**Methods:** This questionnaire-based study was conducted on dental students, the questioner form included experience of gingival bleeding among students, their family experience of gingival bleeding, students' view to address this issue by either stopping tooth brushing and/or other oral hygiene measures or by visiting a dentist to manage the problem. Furthermore, the questioner examined students' knowledge on cause of bleeding and factors (systemic and habits) that associated with it.

**Results:** Three hundred students answered the questioner and the frequency of gingival bleeding were: 15.7% experienced frequent gingival bleeding, 51.6% showed rare gingival bleeding and 32.6% with no experience of gingival bleeding. More than 44% of the students answered that at least one of their family member experienced gingival bleeding. Mechanical stimuli such as tooth brushing were the cause of gingival bleeding of 66.3% participants. Gingival bleeding was also reported by eating hard food like apple (9%) and early morning gingival bleeding (5.3%). After bleeding, 16.7% visited the dentist and 19.3% of students stopped tooth brushing. Around half of the participants related gingival bleeding to the gingival disease itself, whereas, the other half related to other diseases.

**Conclusions:** Gingival bleeding is prevalent among dental students and their family members. Student's knowledge of the cause of gingival bleeding was limited. Furthermore, students' reaction to manage bleeding gingiva is controversial.

**Keywords:** *Gingival bleeding, Dental student, Student knowledge.*

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## Introduction

Proper removal of dental plaque prevents gingivitis and dental caries. Gingivitis could be defined as a reversible inflammation of gingiva due to bacterial plaque accumulation on the tooth surfaces[1]. Gingivitis may progress to periodontitis and eventually ends up with tooth loss[2]. Periodontal diseases show all signs of inflammation such as redness, swelling, heat pain and loss of function, However, pain and loss of function are more apparent as the disease progresses to its advanced stages (periodontitis). Furthermore, periodontal diseases may show other signs of inflammation, which aid proper diagnosis such as suppuration. Therefore, the most common diagnostic signs of periodontitis are suppuration, bleeding on probing[3,4]. Gingival bleeding considered as an early sign of gingivitis and active stage of periodontitis. Other signs can be observed such as redness and swelling of the gingival tissue during gingivitis as the latter may be related to normal gingival biotypes[5,6]. Bleeding takes place as a result of bacteriological and clinical shifts caused during initiation and progression of inflammatory periodontal disease[6].

Chronic gingivitis and chronic periodontitis are the most common causes of gingival bleeding. This bleeding can be easily provoked by the minimal mechanical trauma of mastication, tooth brushing and cleaning interdental areas by dental floss and toothpicks[7]. It is important to acknowledge that the severity of gingival bleeding is not always coincide with the severity of periodontal diseases for example, marginal gingivitis may experience severe bleeding, in contrary, some cases of severe periodontitis may experience mild bleeding[8]. However, bleeding upon probing is still considered as a clinical sign of inflammation when examining periodontal condition. It has been reported that 30% of patients with bleeding on 4 consecutive occasions are at high risk of further disease progression[9,10]. Moreover, according to 1999 classification of periodontal diseases and conditions, there are diseases and conditions that affect gingival tissue. Both diabetes and nutritional deficiency increase gingivitis in association with dental plaque deposition[11]. It is acknowledged that smoking has a negative impact on the health of periodontium. However, the smokers have less bleeding gingiva than a non-smoker. Furthermore, studies showed that even former smoker experience less bleeding than non-smokers[12,13].

This study aimed to assess the prevalence of gingival bleeding amongst a selected sample of dental students and to identify attitude regarding its etiology and management.

## Material and methods

A detailed survey questionnaire was designed, introduced and explained to dental students of College of Dentistry, University of Sulaimani in 2015. The study approved by the scientific committee of College of Dentistry, University of Sulaimani. The questionnaire form included most relevant questions on gingival bleeding (Table 1).

In brief, the questionnaire form asked the participants if they were familiar with normal color of the gingiva and how this color turns during gingival inflammation, their experience of gingival bleeding, if any member of their family had experienced gingival bleeding and students' reaction to address the issue whether by stopping tooth brushing and other oral hygiene measures or by visiting a dentist to manage bleeding gingiva. Furthermore, the questioner includes questions about the students' belief and understanding of possible causes of gingival bleeding such as smoking, systemic diseases or habits as shown in Table 1.

## Results

Three hundred students (157 female/ 143 male) aged between 22-25 years answered the questioner and among them, 97% think pink is a normal color of gingiva, 3% believe that red is the normal color of gingiva and no one thinks brown is a normal color of gingiva.

More than 44% of the students have at least one of their family member with bleeding gingiva, whereas, amongst students themselves, only 15.7% has frequent gingival bleeding, 51.6% has rare gingival bleeding, and 32.6% do not have any gingival bleeding. Regarding gingival bleeding by mechanical stimulations, 66.3% has gingival bleeding during tooth brushing along with only 9% has bleeding on eating hard food like apple. Furthermore, 5.3% of the study sample has early morning gingival bleeding. Over nineteen percent of

Table 1: Descriptive analysis of the questionnaire form for data recruited in this study.

| Questions | Types | Frequency | Percentage% | Total |
|---|---|---|---|---|
| Participants | Female | 157 | | 300 |
| | Male | 143 | | |
| What is the normal color of gingiva? | Pink | 291 | 97 | 300 |
| | Red | 9 | 3 | |
| | Brown | 0 | 0 | |
| If any member of your family has experienced gingival bleeding | Yes | 133 | 44.3 | 300 |
| | No | 167 | 55.7 | |
| Have you ever experienced gingival bleeding? | Frequently | 47 | 15.7 | 300 |
| | Rarely | 155 | 51.6 | |
| | No bleeding | 98 | 32.6 | |
| What do you mostly think may cause gingival bleeding? | Tooth brushing | 199 | 66.3 | 300 |
| | Eating an apple | 27 | 9.0 | |
| | Early morning | 16 | 5.3 | |
| | Others | 58 | 19.4 | |
| Stopping brushing of teeth when we have gingival bleeding | Yes | 58 | 19.3 | 300 |
| | No | 242 | 80.7 | |
| Have you visited a dentist for gingival bleeding? | Yes | 50 | 16.7 | 300 |
| | No | 255 | 83.3 | |
| Do you believe that smoking might increase gingival bleeding? | Yes | 133 | 44.3 | 300 |
| | No | 167 | 55.7 | |
| Systemic condition might cause gingival bleeding | Diabetes mellitus | 133 | 16.7 | |
| | Blood diseases | 132 | 16.6 | 792 |
| | Nutrition deficiency | 201 | 25.7 | |
| | Hypertension | 68 | 8.5 | |
| | Drugs | 157 | 19.8 | |
| | Pregnancy | 101 | 12.7 | |
| What do you think might be a cause of gingival bleeding? | Microbial | 116 | 21.8 | 532 |
| | Systemic diseases | 87 | 16.4 | |
| | Ginigval diseases | 260 | 48.9 | |
| | Family (heritable) | 69 | 12.9 | |
| What do you think you should do if you experienced gingival bleeding? | Stop tooth brushing | 42 | 10.0 | 418 |
| | Increasing frequency of tooth brushing | 42 | 10.0 | |
| | Using mouth wash or using special tooth paste | 121 | 29.0 | |
| | Visiting a dentist | 213 | 51.0 | |

participants quit brushing after experiencing gingival bleeding, whereas, 16.7% of students visit dentist because of gingival bleeding.

Forty-four percent of students think that smoking has increase bleeding. The systemic conditions or diseases that believed to cause gingival bleeding were ranked as follow: 25.7% nutritional deficiency, 19.8% drug intake, 16.7% diabetes mellitus, 16.6% blood diseases, 12.7% pregnancy and 8.5% hypertension. Students' belief on the major cause of gingival bleeding is due to gingival diseases itself (48.9%), followed by 21.8% of participants thought to be microbial, 16.4% of them linked to systemic disease and 12.9% of students believed that gingival bleeding is inherited. Finally, to manage gingival bleeding, 51% of them believed it is better to visit a dentist, 29% of participants recommended mouthwashes and medical toothpaste. Surprisingly, 10% of the study sample answered by stopping tooth brushing, whereas, 10% of the students answered that they increase the frequency of tooth brushing.

## Discussion

Periodontal disease is a painless disease and the majority of people recognize it when it reaches its advanced stage where the prognosis becomes poor. Therefore, awareness and knowledge of this disease are paramount to prevent it and maintain periodontal health[14]. Bleeding of gingiva either spontaneously or by mechanical stimuli (brushing or upon probing) is amongst the early signs of gingival inflammation and it is considered as a predictor of poor prognosis in patients with periodontitis[9,10].

Awareness of people of this early sign of periodontal disease is variable[15,16]. Students in dentistry colleges equipped with lots of information on oral diseases in early years of their study including periodontal disease. Therefore, this study aimed to evaluate the self-experience gingival bleeding among dental students and their knowledge on etiology, pathogenesis and management of gingival bleeding.

Normal color of gingiva is salmon pink, but it can be varied from light pink to deep brown or black based on the degree of keratinization, vascularization and pigmentation[17]. Change in the color of gingiva is an earliest clinical sign of inflammation and is of clinical value as it is considered a sign of mild gingivitis[18]. Majority of study participants (97%) thought that the normal color of gingiva is pink and only 3% of them considered red as a normal color of gingiva. This could be due to the fact the color itself is a subjective measure and people tend to describe it differently[9,11]. Furthermore, brown color of gingiva that happens by melanin pigmentation had not been recognized as normal color of gingiva by any of study subjects and this could be related to unaesthetic appearance rather than disease[12].

Gingival bleeding is a sign of moderate gingivitis[18] and unfavorable response to periodontal treatment[9, 10]. Two-third of the students have reported gingival bleeding either frequently (15.7%) or on rare occasions (51.6%). Furthermore, 44% of their family members have had gingival bleeding. These indicate the low-level awareness of study population and their family members on periodontal health in spite of being responsible for providing motivation and oral hygiene instruction by students themselves to the patients attending the Periodontics Clinic at College of Dentistry, University of Sulaimani. This is not in line with the result of a study on a neighboring country that 25% of study subjects have frequent gingival bleeding[16] and a study on Saudian population[19] has shown that 42% of them have frequent bleeding. The lower figure of gingival bleeding in this study could be due to the facts that this study's subjects are dental students they are more aware of their periodontal health. However, bleeding of gingiva in their family members is in line with the latter study.

Surprisingly, 10% of students gave up tooth brushing when they experienced bleeding and only 16.7% of them visited the dentist to address gingival bleeding, whereas, more than half of them recommend visiting dentist for gingival bleeding. These further indicate low-level awareness of sign of periodontal disease amongst study population and controversies between their action and their recommendation to patients.

Smoking has been identified a major risk factor for periodontal disease and many studies have shown poor response to periodontal treatment in a smoker than a non-smoker[20]. However, smoking has been known to mask gingival inflammation and smoker experience less bleeding on probing than nonsmoker[12]. Ironically, 44% of students believed that smoking does increase gingival bleeding.

There are some systemic diseases, conditions, and medications that increase the likelihood of periodontal disease and gingival bleeding such as patients with diabetes mellitus[21], nutritional deficiency[10] and immune deficiency[22]. Hence why this study examined the students' knowledge of these risk factors. Nutritional deficiency was considered as the main risk factor followed by medication This rather explains populations' belief of bleeding than scientific explanation, however, studies showed that nutritional deficiency is not the major risk factor[23]. Students' knowledge of the causes of periodontal disease is further controversial as more than half of them thought that the gingival bleedings are not related to diseases of the gingiva. Whereas, it is acknowledged that proper motivation and oral hygiene instruction associated with gingival health[24].

Lastly, the majority of study population recommended mouthwash and visiting dentist to manage gingival bleeding which is in line with the fact that periodontal therapy reduces inflammation and thus bleeding.

## Conclusions

Gingival bleeding is prevalent among dental students. Despite receiving all information on etiology, pathogenesis and treatment of periodontal

disease, students' knowledge is insufficient and there were controversies between their belief and their actions. Further studies are necessary to unveil the cause of this limited knowledge among this study population.

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