



## The Most Common Chief Complaints Among Patients Attending the Periodontal Clinic and Their Relationship with Periodontal Disease

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### Abstract

**Background:** Periodontitis is a chronic inflammatory disease affecting the periodontium. Its impact on systemic health has been proved. Therefore, early detection of this disease is crucial. However, periodontitis is known to be a silent disease in early stages. Patients usually are unaware of their periodontal health status.

**Aims:** This study aimed to identify the most common chief complaints of patients attending a periodontal clinic and compare these complaints to the clinical diagnosis of periodontitis and gingivitis.

**Methods:** This cross-sectional study investigated dental records of patients attending a university periodontal clinic. Chief complaints of the patients were divided into groups including halitosis, bleeding gums, pain, and discomfort. These complaints were compared to the clinical periodontal condition of the patients. X<sup>2</sup> test, regression, and decision tree analyses were performed.

**Results:** A Total of 520 dental records were assessed. 202 (38.8%) of the patients attended for check-up with no complaints. Half of them had healthy periodontium. Of patients complaining of pain or discomfort, 65.5% had periodontitis (x<sup>2</sup> p-value=0.001). Additionally, half of the patients who complained of bleeding gums were diagnosed with periodontitis, however, this was not statistically significant (x<sup>2</sup> p-value=0.065). The decision tree analysis showed that young age (≤29 years) non-smoking patients with periodontal disease were more likely to complain of bleeding gums (15 out of 23 (65.2%)),

**Conclusion:** This study showed that young patients with periodontal disease were complaining from pain and discomfort, and bleeding gums among non-smoking patients. This can help in increasing the awareness of periodontal disease among young population to seek professional care early to prevent periodontal destruction.

## **Introduction:**

Periodontal disease is a chronic inflammation of the periodontium associated with bone destruction and loss of periodontal support around teeth (1). Oral microorganisms particularly virulent periodontopathogens represent the keystone in initiating periodontitis. However, patients' immune system interplays an important role in bone destruction (1,2). In addition, risk factors can manipulate the progression of this disease (3). Periodontitis itself has been shown to be a risk factor to other serious systemic diseases such as cardiovascular diseases and diabetes mellites (4,5). Management of periodontitis was shown to help in managing these serious systemic illnesses (4–6). Periodontitis is an irreversible disease, and it can result in loss of teeth. This disease can progress silently to reach a point that is not easily treated (7), in addition to its proven stimulatory impact on systemic inflammatory cytokines (8). There are some signs and symptoms that can be related to periodontal disease. However, these symptoms might be common with other oral diseases, or masked by co-existing risk factors. Gingival bleeding, for example, is one of these symptoms. In smokers, particularly heavy smokers, gingival bleeding can be reduced or masked compared to non-smoking patients, due to the effect of nicotine on the angiogenesis and vascular diameter of the small blood vessels (9,10). Periodontitis is globally prevalent and its treatment is mostly expensive. Moreover, it is affecting population with low socioeconomic status. Thus, it increases the burden of the disease and its management (11). Detecting early symptoms by patients might help in identifying the early stages of periodontitis by them and seek professional advice. As a result, early management can prevent further treatment burden. Studies have investigated the possibility of diagnosing periodontitis from self-reporting questionnaire (12). However, this is still debatable because of the silence nature of the disease and the poor awareness of the disease and its effect on general health

among population. Few studies have investigated the common chief complaints of patients with periodontal disease (13–15). The early detection of periodontal disease is crucial in treatment planning and predictable non-surgical management. Early diagnosis of periodontitis prevents further possible surgical solutions that increase the treatment burden for the patients. Therefore, identification of the most common symptoms may help in building of awareness for self-reporting periodontal disease, to seek periodontal advice and care early. This is a surveillance study aimed at identifying the most common chief complaints that patients with periodontal disease report, and compare these complaints to the clinical diagnosis of periodontitis and gingivitis.

## **Methods:**

A cross-sectional study was designed. Dental records of all patients attending periodontal clinic at the Dental Teaching Hospital, Tikrit University during the academic year 2023-2024 were assessed in this study. Those patients received full oral examination and clinical periodontal diagnosis. Treatment plan was formulated for each patient according to the diagnosis. Data retrieved for this study from the dental records includes:

- 1- Demographic information: Age, gender, educational level, and occupation),
- 2- Chief complaint: Recorded in patient's own words. This data was grouped qualitatively by similar complaints, resulting in 7 groups. They were halitosis, bleeding gums, pain and discomfort in the gingiva, awareness of calculus presence and seeking scaling and polishing, seeking esthetic for different reasons such as stains on teeth, attending for check-up, and others constitute (gummy smile, hypersensitivity, and showing of teeth roots).
- 3- Diagnosis: At the Dental Teaching Hospital, Tikrit University, the diagnosis of periodontal disease is

based on the world workshop on the new classification of periodontal disease in 2017 (16). The diagnosis was divided into three groups:

Group 1: Healthy periodontium

Group 2: Gingivitis - when clinical attachment loss (CAL) is less than 2mm and bleeding on probing (BoP) is present in 10% of the oral sites or more (16).

Group 3: Periodontitis -when there is an interdental CAL of 2mm or more.

Data analysis was conducted using BMI SPSS computer program version 24. Descriptive analysis was performed including mean and standard deviation (SD), numbers and percentages.  $X^2$  test was performed to compare between categorical data. Logistic regression analysis was performed to assess the association between periodontal diseases and chief complaints taking into account age, gender, educational level and smoking status as confounding factors. Odds ratio (OR) and 95% Confidence interval (CI) were calculated. Decision tree analysis was conducted to identify the most common chief complaint among patients with periodontal disease.

## Results:

A total of 520 patient records were retrieved. The mean age of the patients was 26.42 years (SD 9.67). Around 73% of them were less than 26 years old (young age). Males were more than females (427 (82.1%) vs. 93 (17.9%)), whilst almost three quarters of the patients were students (388 (74.6%)). More than one third of the patients were smokers. Although the majority of the patients had healthy periodontium (219 (42.1%)), while 183 (35.2%) had periodontitis and the rest were diagnosed with gingivitis (Table1). Regarding the chief complaint of the patients, the majority attended the clinic for check-up (202 (38.8%)); no complaint was recorded. Among those, half of them had healthy periodontium and the rest were divided almost evenly between gingivitis and periodontitis (43 (21.3%), and 58 (28.7%), respectively;  $X^2$  p-value

$<0.05$ ). 25.4% of the patients attended the clinics for esthetic reasons, such as removing stains, having anterior diastema and gummy smile. The most common complaint among patients was halitosis (103 (19.8%)). However, the majority of those patients were clinically healthy from the periodontal point of view (43 (41.7%)). In relation to the complaint of pain or discomfort in their gingiva, 65.5% were diagnosed with periodontitis ( $x^2$  p-value=0.001). In addition, bleeding gums was the second most common complaint that patients reported (6.9%). Of those patients, 19 (52.8%) were diagnosed with periodontitis, however, this was not statistically significant ( $x^2$  p-value = 0.065) (Table 2).

The results of the logistic regression showed an association between periodontal diseases and almost all the symptoms recorded in the chief complaints of the patients, although the 95% CI was wide and crossing one. For check-up and seeking esthetic, the association was inverse. Adjustment for age, sex, smoking status and education level did not change the results (Table 3). The decision tree analysis showed that the chief complaint reported by those less than 30 years correlated with their clinical diagnosis, especially periodontitis. Male patients aged 29 years old or younger reported pain or discomfort more when they have periodontitis. Female patients with the same age were diagnosed with gingivitis more than periodontitis when they reported pain and discomfort as a chief complaint. Bleeding gum was the second important chief complaint reported among young non-smoker patients who were diagnosed with periodontal disease, especially periodontitis. Interestingly, of the chief complaints recorded, those seeking esthetic advice and treatment had healthy periodontium and were young smokers compared to those with other complaints (Figure 1 and supplementary document 1).

## **Discussion:**

This is a cross-sectional study using patients records to assess the chief complaints made by patients who visited a periodontal clinic seeking treatment. Cross-sectional studies are more convenient in exploring the characteristic features of a specific disease or condition with low expenses and without follow-up (17). In this study, the results showed that risk factors, especially the age and smoking habits, can affect the symptoms of periodontitis. According to the decision tree analysis, bleeding gums and pain and discomfort were the most common symptoms behind visiting the periodontal clinic and seeking treatment especially among young non-smoking patients.

Although, this subject was previously addressed by few studies (13–15) to the best of our knowledge, this is the first study investigating the common chief complaints and comparing them to the final diagnosis of periodontal disease including gingivitis and periodontitis. In addition, smoking and age was taken into account to identify the effect of these risk factors on patient's complaints. Generally, the findings in our study are compatible with a previous study by (Bista et al. 2022), which showed that patients commonly attended periodontal clinic to remove stains and sought esthetic advice and treatment (15). However, the mentioned study assessed the prevalence of chief complaints among patients regardless of their periodontal health status. On the other hand, another study by Brunsvold et al. in 1999, contradicted the results in this study. They found that referring was the main reason patients sought periodontal treatment following being referred, while true symptoms such as bleeding and painful gingiva were not common among those patients (14). This study investigated 191 patients' records, 89% of whom diagnosed with periodontitis. A recent study with a sample size of 589 patients investigated the association between chief complaints and stages of periodontitis (13). This study showed that halitosis is the least prevalent complaint among patients and it was not related to periodontitis stages, a result

which agreed to our findings. Moreover, they showed that teeth mobility and bleeding gums are more common chief complaints among periodontitis patients, particularly stage IV (13).

As per decision tree analysis, understandably, bleeding gums was not common among smoker patients, although those patients were diagnosed with gingivitis or periodontitis. Smoking was previously proved to decrease gingival bleeding (18–20). Nicotine can affect blood vessels and provoke vasoconstriction (9). Moreover, it has been shown that smoking can reduce angiogenesis and decrease the diameter of the small blood vessels present in the gingiva (10). This effect can lead to reduce bleeding provoked by inflammation and leads to masking the inflammation in the gingival area.

In the current study, retrieving 520 patients' records represent an adequate sample size that adds to the power of the analysis. However, by grouping the chief complaints into subgroups according to age groups, smoking status, and gender render the sample size small in the respective subgroups, which might hamper the final results, particularly regression analysis (21). In addition, the population were selected from one clinic (i.e. The Dental Teaching Hospital at Tikrit University), this might influence the generalizability of the study. It is recommended to explore the common symptoms among patients with periodontal disease in different population in order to generalize the results. Importantly, the population of this study were patients attending a periodontal clinic. This might underestimate the symptoms of periodontal disease, because those patients are more aware of their periodontal health status compared to others who do not seek periodontal management.

Periodontitis is a silent disease at its early stages. However, this disease has shown a huge burden on general health as well as on oral health. Therefore, finding a way to identify this disease in its early stage is an important subject that needs lots of attention from the dental scientists. Simple questionnaire regarding the most common

symptoms of periodontitis can help in identifying this disease in its early stages and prevent further damage. As a step forward, it is suggested to investigate the symptoms that the periodontal patients are suffering from which might help to increase the awareness of the population about the early stages of this disease particularly among young adults. This can be achieved by conducting a population-based study to investigate the common symptoms of periodontitis focusing on early stages of periodontitis (i.e. stage I and II). An awareness program that increases knowledge about periodontal diseases and their burden among the young population should be a strategic priority for health authorities.

### **Conclusion:**

Within the limitation that has been mentioned above, this study highlighted that pain and discomfort are the most common symptoms among patients with periodontal disease, particularly among young patients. Moreover, Bleeding gums were the second most common complaint reported by young, non-smoking patients with periodontitis.

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This research received no external funding.

### **Conflicts of Interest**

The authors declare that they have no conflict of interest

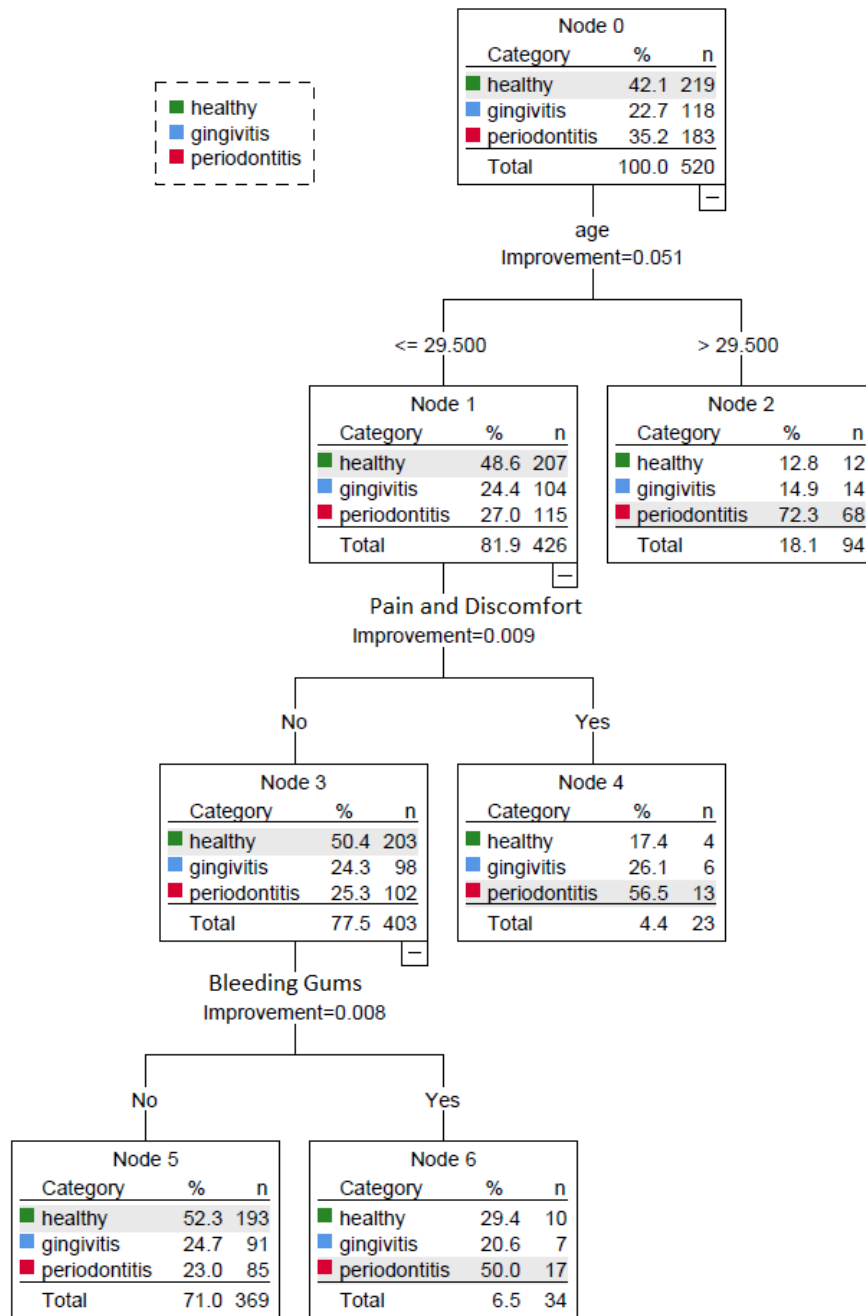


Figure 1 Decision tree analysis reduced to 3 levels (the full tree analysis is available in the supplementary document 1)

Table 1: General characteristics of the study population

Parameter	No. (%)	
Age	<26year old	382 (73.5%)
	26-35 years	75 (14.4%)
	36-45	30 (5.8%)
	>45	32 (6.2%)
Gender	Males	427 (82.1%)
	Females	93 (17.9%)
Education level	Primary education	42 (8.1%)
	Secondary education	36 (6.9%)
	College education	442 (85%)
Occupation	No work	17 (3.3%)
	Student	388 (74.6%)
	Employee	16 (3.1%)
Smoking		204 (39.2%)
Diagnosis of periodontal disease	Healthy	219 (42.1%)
	Gingivitis	118 (22.7%)
	Periodontitis	183 (35.2%)

Table 2. Chief complaint reported by patients attending the Dental Teaching Hospital, Tikrit University, Iraq.

	Total No. (%)	Gingivitis No. (%)	Periodontitis No. (%)	X <sup>2</sup> p-value
Halitosis	103 (19.8%)	21 (20.4%)	39 (37.9%)	0.754
Bleeding gums	36 (6.9%)	7 (19.4%)	19 (52.8%)	0.065
Seeking esthetic	132 (25.4%)	37 (28.0%)	42 (31.8%)	0.228
Aware of calculus presence	10 (1.9%)	4 (40.0%)	1 (10.0%)	0.189
For check ups	202 (38.8%)	43 (21.3%)	58 (28.7%)	<b>0.01*</b>
Pain or discomfort	29 (5.6%)	6 (20.7%)	19 (65.5%)	<b>0.001*</b>
Others	15 (2.9%)	3 (20.0%)	6 (40.0%)	0.920

\*Statistically significant

Table 3 Distribution of chief complaint according to the clinical periodontal diagnosis

	Gingivitis Adjusted OR (95% CI)*	Periodontitis Adjusted OR (95% CI)*
Halitosis	0.91 (0.24-3.41)	0.43 (0.13-1.42)
Bleeding gums	1.98 (0.50-7.91)	1.86 (0.55-6.23)
Seeking esthetic	1.64 (0.41-6.59)	0.39 (0.11-1.36)
Aware of calculus	1.89 (0.30-11.72)	0.15 (0.01-1.73)
Attending for check up	0.95 (0.23-3.88)	0.33 (0.10-1.14)
Pain or discomfort	2.78 (0.43-18.06)	2.21 (0.43-11.38)
Others	1.12 (0.17-7.40)	0.36 (0.06-2.09)

\*Adjusted for age, gender, educational level and smoking

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