

## ORIGINAL ARTICLE

# Knowledge of Patients about Association between Orthodontic Treatment and Periodontal Diseases

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## ABSTRACT

**Background:** Little is known about periodontal health knowledge among orthodontic patients. Orthodontists through their long-term treatment procedure have opportunity and responsibility to educate their patients about periodontal health and to promote proper oral health behavior with emphasis on the prevention of periodontal disease.

**Objective:** The objective of this study was to assess the knowledge of patients about association between orthodontic treatment and periodontal diseases.

**Results:** About 18% of the subjects identified what does bleeding gum indicate. Only 25% did not know what plaque is and only 24% did not know what does it cause. Only 24 subjects (8%) correctly answered all related questions. No significant differences were found among the studied groups. A high positive correlation was found between educational level of the subjects and their periodontal health knowledge ( $R_2 = 0.172$ ,  $P = 0.005$ ). An awareness score was taken.

**Conclusion:** Periodontal health knowledge among orthodontic patients was poor. Orthodontic patients' awareness of their periodontal health was moderate and was affected by age, attitude, and duration of orthodontic treatment.

**Keywords:** Awareness, Knowledge, Malocclusion, Mucogingival problems, Orthodontic, Periodontal health.

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## INTRODUCTION

Periodontitis is defined as an inflammatory disease of supporting tissues of teeth in response to dental

plaque. Studies have shown a significant increase in the quantity of dental plaque and the occurrence of gingivitis in patients with fixed orthodontic appliances.<sup>[1]</sup> For this reason, special efforts are required for adequate oral hygiene during fixed appliance treatment as its presence makes tooth cleaning more difficult.<sup>[2]</sup> During fixed orthodontic appliance therapy, patient's knowledge, motivation, cooperation, and attitude toward treatment are key factors of oral hygiene maintenance.<sup>[3]</sup> Poor maintenance of oral hygiene may be due to lack of knowledge or negligence by patients themselves.<sup>[4]</sup> Various reports have shown that orthodontic patients' knowledge on their gingival health was poor.<sup>[5]</sup> Despite receiving appropriate instructions, many individuals fail to follow these instructions. Furthermore, many of them lack knowledge on the maintenance of oral hygiene. It has been documented that improvement of oral hygiene compliance and effectiveness during orthodontics can be achieved with professional instruction and monitoring.<sup>[5,6]</sup> Before the beginning of orthodontic treatment, patients should be instructed about the importance of regular oral hygiene maintenance.<sup>[7]</sup> It is necessary to demonstrate to patients the correct technique and frequency of tooth brushing. They need to learn about the right toothbrushes, interdental, and orthodontic brushes, as well as the auxiliary devices for oral hygiene maintenance.<sup>[8]</sup> Little is known about periodontal health knowledge and awareness among orthodontic patients. Therefore, the aims of this study were to assess the knowledge of patients about association between orthodontic treatment and periodontal diseases.

## MATERIALS AND METHODS

An ethical approval for the conduction of this study was obtained from the institutional review board of the institution. A convenient sampling technique was adopted in the present study. A structured questionnaire was administered to 100 orthodontic patients recruited from orthodontic department of the Qassim Private College at Buraydah. At present, treated orthodontic patients of the college during the study period who agreed to participate in the study were included in the study. The patients received both verbal and written information about the study. All subjects were of similar

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economic and social background. All 100 orthodontics patient filled the questionnaire completely and were included in this study. Age averaged  $15 \pm 5.0$  years (70 subjects were <18 years and 30 subjects were 18 years or above, age range 18–30 years). 55% of subjects were schoolchildren and the rest were university students. Subjects were currently wearing upper and lower fixed orthodontic appliances for an average duration of  $12 \pm 7$  months. All subjects had healthy periodontium before the start of orthodontic treatment and were instructed for the need to properly clean the teeth after placing the appliance. Patients with cognitive disorders or chronic medical conditions, craniofacial anomalies such as cleft lip and palate and aggressive periodontitis were excluded from the study. A self-administrated structured questionnaire, which was applied in previous study,<sup>[9]</sup> was used as the instrument for data collection. The questionnaire was self-administered to the participants in the waiting areas of orthodontic clinics. It contained a series of questions in relation to demographic characteristics of the subjects age, gender, duration of fixed orthodontic treatment, and the patient's current oral health behavior (frequency and duration of tooth brushing, auxiliary aids, and dental visits). 10 questions related to subject's awareness toward periodontal health were scored as 0 if the answer was "I don't know" and as 1 if the answer was "yes" or "no." Subsequently, subjects were allocated into a high level of knowledge (average score 8–10), a moderate level of knowledge (5–7), a low level of knowledge (average score 1–4), and no knowledge (score 0) groups. Questions related to periodontal knowledge included what is dental plaque, what can dental plaque cause, what does bleeding gum indicate, and how to prevent gum disease. Answers were given in the form of multiple choice, with only one correct answer. Questions related to subject's knowledge of periodontal health were scored as 0 if the answer was correct and as 1 if the answer was incorrect. Questions related to subject's attitude toward orthodontic treatment and periodontal health was scored as 0 if the answer was negative and as 1 if the answer was positive. Subsequently, subjects were allocated into positive attitude (average score 6–9) and negative attitude (average score 0–5) groups.

### Statistical Analysis

Data were entered into a personal computer and analyzed using the Statistical Package for the Social Sciences (SPSS) software (SPSS®: Inc., Chicago, IL, USA). Chi-square and independent sample *t*-tests were used to detect knowledge among orthodontic patients. The level of statistical significance was set at  $P \leq 0.05$ .

## RESULTS

### Oral Hygiene Behavior

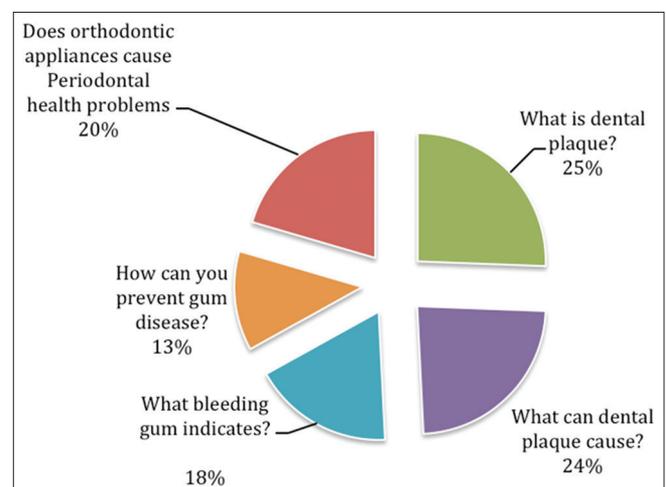
About 92% of orthodontic subjects reported they brush their teeth frequently. 66% brushed twice and 28% brushed 3 times daily. Of those, only 67% used auxiliary aids. 6% (2% adolescents and 4% adults) of orthodontic subjects admitted they do not brush at all.

### Orthodontics Patients' Knowledge of Periodontal Health [Graph 1]

About 18% of the subjects identified what does bleeding gum indicate. Only 25% did not know what plaque is and only 24% did not know what does it cause. Only 24 subjects (8%) correctly answered all related questions. No significant differences were found among the studied groups. A high positive correlation was found between educational level of the subjects and their periodontal health knowledge ( $R^2 = 0.172$ ,  $P = 0.005$ ). An awareness score was taken and the results are shown in Table 1.

## DISCUSSION

This study presented knowledge of orthodontic patients toward their periodontal health.<sup>[10-13]</sup> There was a 1:3 males-to-females' ratio for the sample of treated patients. This finding reflects the fact that females are more concerned with their esthetics, so they demonstrated better attendance to have their dentition



Graph 1: Periodontal knowledge among orthodontic patients

Table 1: Level of periodontal awareness among orthodontic subjects

| Awareness scores                | Orthodontic subjects (%) |
|---------------------------------|--------------------------|
| High awareness (scores 8–10)    | 7                        |
| Moderate awareness (scores 5–7) | 69                       |
| Low awareness (scores 1–4)      | 24                       |

maintained and checked and thus were more represented in the sample. Sharma<sup>[14]</sup> found that females seeking orthodontic treatment were approximately twice the males. Oral hygiene behavior of orthodontic subjects in this study was good. The majority of subjects reported brushing frequently, while only 6% admitted no brushing. This was expected since adequate oral hygiene level is requested before receiving any orthodontic treatment. Davies *et al.*<sup>[15]</sup> concluded that regular visits to the orthodontist are the most likely reason for improvement in oral hygiene and gingival health. However, Atassi and Awartani<sup>[16]</sup> evaluated the oral hygiene status of patients with fixed orthodontic appliances and reported that 40% had fair oral hygiene and 60% had poor oral hygiene. The difference in the reported percentages may be due to variability of culture, availability of oral care services, and different population. Oral hygiene behavior of orthodontic subjects in this study was similar to that reported by Baheti and Toshniwal.<sup>[5]</sup> In general, public awareness of gum disease and particularly the role of dental plaque in relation to periodontal disease is poor, presumably due to inadequate health education concerning these conditions. Majority of orthodontic patients did not know what plaque is and what does it cause. This was in agreement with Azodo and Umoh,<sup>[17]</sup> who reported that only 12.6% of the participants knew dental plaque as soft debris on teeth. Likewise, the majority of Jordanian adults,<sup>[8]</sup> who incorrectly defined the meaning of dental plaque, did not know the harmful effect of plaque and its role in the etiology of gingival disease. However, most of the study participants had a good level of knowledge regarding the role of oral hygiene in preventing gum disease, a finding that was reported in other studies.<sup>[8]</sup> The majority of subjects in this study identified bleeding gum as a sign of periodontal disease. Most of the orthodontic patients in this study had a high level of awareness of their periodontal health. They were aware of having dental calculus and dental stain, but not aware of having dental plaque. This may be due to the easy identification of stains and calculus on teeth. Baheti and Toshniwal<sup>[5]</sup> showed that nearly 50% of the Indian patients were unaware about periodontal health. In the present study, similar periodontal health awareness among boys and girls was recorded. However, most of them reported on the importance of oral hygiene measures and the need to follow these instructions. The negative attitude of orthodontic patients was increased by the longer duration of orthodontic treatment and age of the patients. This negative attitude may be caused by feeling tired and bored by the appliances, due to the increased duration of orthodontic treatment. Orthodontic patients' awareness of their periodontal health during fixed orthodontic

treatment demonstrated a significant association with their attitude, number of teeth with gingival recession, duration of treatment, and age. The results of this study indicated a poor knowledge. However, self-directed educational material such as a leaflet is an inexpensive and practical way of targeting large sections of the population to consider health change. Cultural differences, socioeconomic status, educational background, and availability of orthodontic services may explain these variations. Limitations of this study include small sample size with different female-to-male ratio, included subjects had different malocclusion with varying severities, and the subjects were recruited from a single orthodontic practice.

## CONCLUSION

Periodontal health knowledge among orthodontic patients was poor. Orthodontists through their long-term treatment procedure have opportunity and responsibility to educate their patients about periodontal health and to promote proper oral health behavior with emphasis on the prevention of periodontal disease.

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