



The 17th Year Publication, No.1

June 2025

ASSESSMENT OF ORAL HYGIENE AND GINGIVITIS IN PATIENTS DURING ORTHODONTIC TREATMENT

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Abstract

Introduction

Orthodontic treatment can use fixed or removable orthodontic appliances to straighten teeth and improve bite. Maintaining good oral hygiene throughout life is important to address several issues, including gingivitis.

Methodology

The standard of observational study was the study of oral hygiene and the risk of gingivitis in patients undergoing dental treatment. This is an observational, cross-sectional study, conducted in several dental clinics in Tirana and Prizren. Through a standardized, all-online questionnaire for 70 patients, oral hygiene and signs of gingivitis were collected. Statistical analysis was performed with the R program. Oral hygiene was assessed with a 0–5 points system, while gingivitis was clinically assessed based on redness, swelling, and bleeding during tooth brushing.

Results

A total of 64 were included. 69% were female and 31% male. Oral hygiene was good in 37% of cases, average in 44% and poor in 19%. The risk of gingivitis was lower in patients with good hygiene (83% symptoms), while patients with inadequate or insufficient hygiene had higher symptoms of gingivitis. Most patients reported that they had received clear instructions from the orthodontist for oral care throughout their lives.

Conclusion

The results of this study indicate that there is a relationship between the level of oral hygiene and the risk of developing gingivitis in patients undergoing orthodontic treatment. It is recommended that oral hygiene care must be an essential component of treatment and that regular monitoring of oral hygiene and timely intervention must be performed.

Keywords: *hygiene, gingivitis, orthodontic appliances, risk, symptoms*

Introduction

Orthodontic treatment is an effective way to improve dental function and aesthetics. (Sarva Sri et al., 2022). While the main goal is to align teeth, maintaining good oral hygiene is essential to avoid complications such as gingivitis and caries (Patil et al., 2021). Le Foulter et al. (2021) emphasize that oral hygiene directly affects overall oral health during and after orthodontic treatment.

However, maintaining optimal oral hygiene is difficult while the patient is wearing orthodontic appliances (Santonocito, S, 2022). Orthodontic appliances promote the accumulation of dental plaque, which results in both quantitative and qualitative changes in the oral microbiota (Antezack, A. 2018, Al-Anezi 2013), thus exposing patients to several side effects, such as white spot lesions, dental caries, periodontal pathologies, and halitosis.

Thus, oral assessment of patients before, during and after treatment is necessary, as well as instructions and motivation for oral hygiene (Manuelli, M., et al. 2019). Therefore, orthodontists should educate patients on oral and periodontal hygiene to control dental and periodontal complications. In addition to preventing complications, maintaining good oral hygiene contributes to improved overall oral health, healthier teeth and gums, and may even shorten the duration of orthodontic treatment (Spoonhower Orthodontics, 2024).

To minimise the negative effects of poor oral hygiene, it is essential to follow daily oral hygiene rules, including brushing teeth at least twice a day with a soft-bristled toothbrush or special orthodontic brushes and fluoride toothpaste, using dental floss, and using an antimicrobial mouthwash (Saccomanno 2022).

It is essential to constantly remind patients of the importance of oral hygiene in protecting periodontal tissues to obtain optimal and satisfactory results.

In the foreign literature, many studies have studied the importance of oral hygiene during orthodontic treatments. Consequently, the purpose of this study is to provide information for Albania and Kosovo regarding oral hygiene and gingivitis in patients undergoing orthodontic treatment. Specifically, this study aims to evaluate oral hygiene and the incidence of gingivitis in patients undergoing orthodontic treatment.

Methodology

This is an observational, cross-sectional study conducted in different dental clinics in Tirana and Prizren. A standardized questionnaire was distributed online to 70 patients undergoing orthodontic treatment. The study included patients aged 14 to 30 years who had fixed orthodontic appliances and had been under treatment for at least 3 months. A total of 64 forms were completed, and their data were analyzed using the statistical program R.

Oral hygiene was assessed using a 0 to 5 scoring scheme based on hygiene routine. The interpretation was as follows:

- 0–2 points: poor hygiene
- 3–4 points: average hygiene
- 5 points: good hygiene

Clinical signs such as gingival redness, swelling, and bleeding on probing were used to assess gingivitis.

Patients were also asked whether they had received oral care advice from their orthodontist during treatment. Data were analyzed through percentages and tabular/graphical presentations to identify distribution

by age, gender, level of oral hygiene, and risk for gingivitis.

Results and Discussions

Data from 64 patients were analyzed to assess oral hygiene and signs of gingivitis during orthodontic treatment. The results show the distribution by age, gender, level of hygiene and the relationship with clinical symptoms of gingivitis.

According to the results presented below in Table 4.1 for the percentage of patients by age group, it is noted that the highest percentage is in the 25 - 30 years old category with 43%, followed by the 14 - 18 years-old age group with 34%, and the category with the lowest percentage is 19-25 year old with 23%. Since the largest group was that of young adult patients (25–30 years old), this may be related to a greater awareness of aesthetics and oral health in this age group.

Table 4.1.: Percentage of patients presented for orthodontic treatment by age group

Age group	Percentage of patients
14-18	34%
19-25	23%
25-30	43%

Regarding the data by gender, it is noted that women constitute the highest percentage of participants in this survey, with 69% and men with 31%. The dominance of women in this study may be related to this group's greater interest in aesthetic treatments and oral care.

Table 4.2.: Percentage of patients presenting for orthodontic treatment by gender

Gender	Percentage of patients
Female	69%
Male	31%

From the assessment of the level of oral hygiene according to the data in Table 4.3, it was observed that 37% of the patients had good hygiene, 44% had average hygiene, and 19% had poor hygiene. This indicates that a significant proportion of patients fail to maintain optimal hygiene during orthodontic treatment, which increases the risk of complications such as gingivitis. While only one in three patients achieved the maximum score, the rest needed improvement in daily oral care practices.

Table 4.3.: Percentage of patients by level of oral hygiene

Total	Interpretation of hygiene	Percentage frequency of patients according to oral hygiene level
0-2	Poor hygiene	19%
3-4	Average hygiene	44%
5	Good hygiene	37%

Based on the data presented in Figure 4.1, the most common symptoms of gingivitis in patients undergoing orthodontic treatment included bleeding gums during brushing, reported by 38% of participants. Swelling of the gums was noted by 31%, while 25% of patients reported gum pain. These findings indicate that, although the majority of patients do not present severe symptoms, a significant proportion ex-

perience clinical signs of gingivitis, which highlights the importance of regular check-ups and education on oral hygiene during orthodontic treatment.

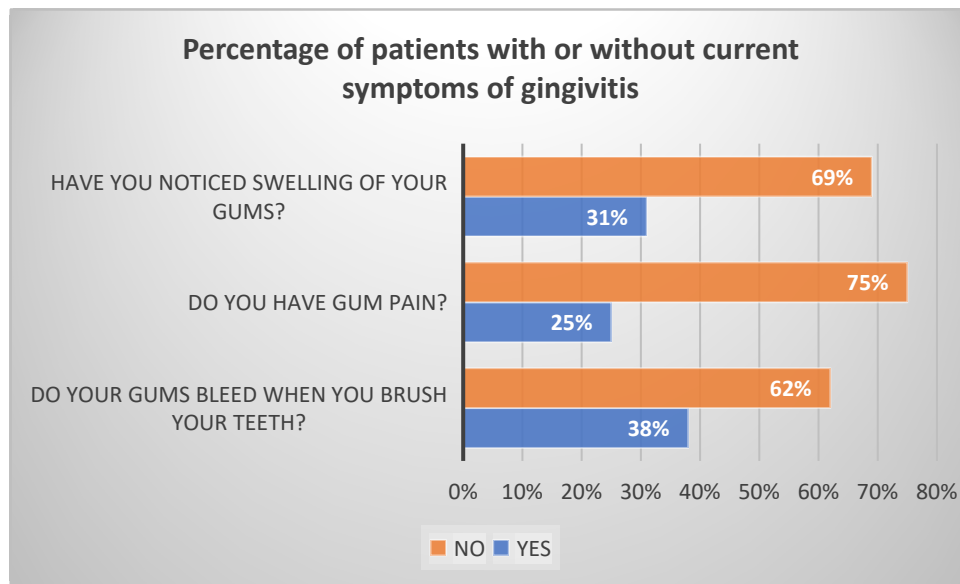


Figure 4.1: Percentage of patients with current symptoms of gingivitis

Most patients (as shown in Figure 4.2) stated that they received clear instructions on oral care from their orthodontist. However, the existence of cases with poor hygiene suggests that one-time instruction is not sufficient, and periodic monitoring and reinforcement of oral education is required.

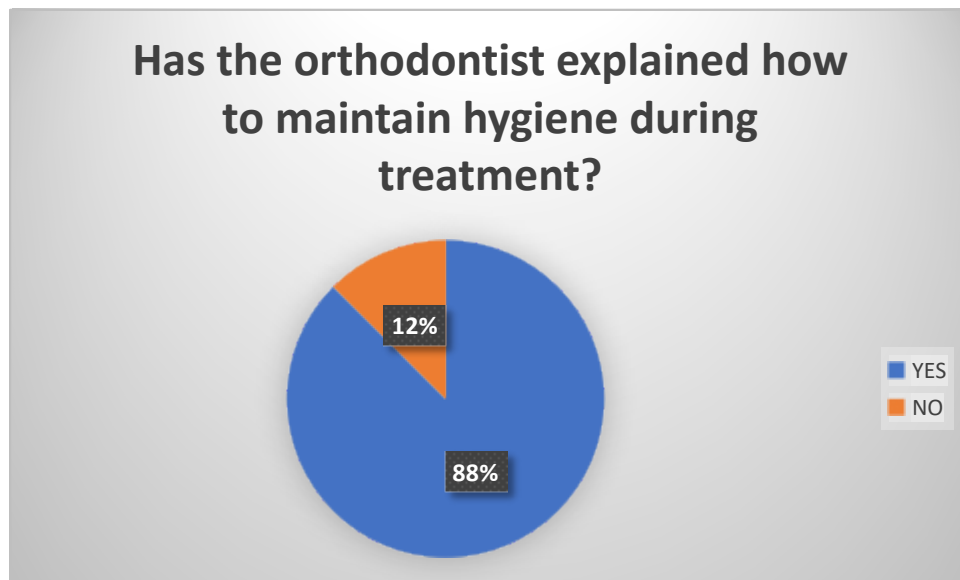


Figure 4.2.: Percentage of patients to whom the orthodontist explained or did not explain how to take care of oral hygiene during treatment.

The prevalence of gingivitis symptoms (Table 4.4) varied significantly by level of oral hygiene. Patients with good hygiene (5 points) had a very low risk, with 83% showing no symptoms of gingivitis. Meanwhile, among those with average hygiene (3–4 points), only 46% were symptom-free, while the rest showed mild or moderate signs of gingival inflammation. Patients with poor hygiene (0–2 points) had the highest prevalence of symptoms, with 74% showing clinical signs of gingivitis such as redness, swelling

and bleeding. These findings indicate a clear association between the level of oral hygiene and the risk of developing gingivitis during orthodontic treatment.

Table 4.4.: Relationship between oral hygiene and risk of gingivitis

Oral hygiene	High risk	Average risk	Low risk	Very low risk, no symptoms
5 (good)	0	0	17%	83%
3-4 (average)	8%	31%	15%	46%
0-2 (poor)	11%	21%	42%	26%

The findings of this study are consistent with international literature, which emphasizes that poor oral hygiene during orthodontic treatment is an important risk factor for the development of periodontal diseases, gingivitis and caries. A systematic review published in the Saudi Journal of Oral and Dental Research (2023) by Almutairi et. al. evidenced that patients with poor hygiene presented a higher percentage of gingivitis symptoms. The data emphasize the necessity of continuous education and periodic monitoring to maintain oral hygiene during treatment, thus reducing the risk of long-term complications.

Conclusions

The results of this study indicate that there is a relationship between the level of oral hygiene and the risk of developing gingivitis in patients undergoing orthodontic treatment. Patients with good hygiene showed fewer clinical signs of gingival inflammation, while those with average or poor hygiene had a higher incidence of gingivitis symptoms. These results emphasize the need to integrate oral hygiene education as an essential part of orthodontic treatment.

Recommendations

Conducting further studies with larger samples and advanced methodologies to assess other factors influencing oral hygiene during orthodontic treatment.

Implementing educational programs for patients starting orthodontic treatment, focusing on the importance of oral hygiene and proper cleaning techniques.

Periodically following up with patients during treatment through personalized reminders (SMS, phone calls or apps) to reinforce good oral hygiene practices and monitor improvements or difficulties.

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