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Oral Hygiene Behavior during Treatment with Fixed Orthodontic Appliances

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Abstract:*Maintaining good oral hygiene, reducing the presence of dental plaque in the mouth is an important part of the everyday lives of patients. The importance is even greater in patients undergoing orthodontic treatment. The aim of this study was to assess the oral hygiene behavior among the patients during orthodontic treatment with fixed appliances. One hundred and two orthodontic patients (65 female) and (37 male) treated with fixed appliances were studied. Patients were requested to fill out a structured questionnaire about oral hygiene behavior after placement of fixed orthodontic appliances. Results showed that 65.68 % from the patients brush their teeth twice a day. Most of them, 68.63% use orthodontic tooth brush and 78.43% use fluorid toothpaste. 33.33% from the patients use interdental brushes and 81.37% of them are using mouthwash solutions. Percentage of regular and occasional uses of dental floss were 7.84% and 21.57%. Oral hygiene instructions are necessary throughout the entire orthodontic treatment and they need to be strengthened. Patients undergoing fixed orthodontic treatment are required to be educated and motivated to maintain their oral hygiene on a high level.*

Keywords: *Dental floss,Interdental brushes,Mouthwash solutions, Oral health, Orthodontic treatment*

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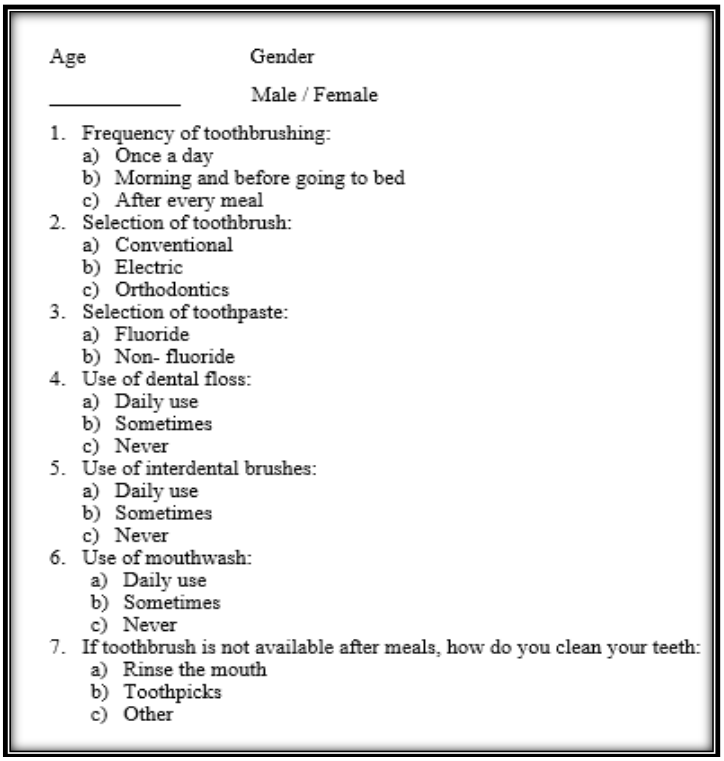
I. Introduction

Orthodontics is a specialized field in dentistry that deals primarily with prevention, followed by diagnosis and treatment, and correction of irregularities in teeth and jaws. Malocclusions affect oral functions, cause speech impediment disorders, difficulty in swallowing, mastication itself becomes difficult due to the present incorrect occlusion. Orthodontic treatment plays an important role in the improvement of the patient's facial aesthetics, which also affects the self-esteem of the patient. Maintaining good oral hygiene, reducing the presence of dental plaque in the mouth is an important part of the everyday lives of patients. The importance is even greater in patients undergoing orthodontic treatment, where it is necessary to enhance itto avoid side effects such as gingival inflammation, periodontal complications, enamel demineralization and dental caries.Demineralization of the enamel is considered to be the most important notable iatrogenic factor in orthodontic treatment with fixed appliances.[1] Oral hygiene habits are crucial during the orthodontic treatment itself because improper hygiene results in an increased accumulation of dental plaque on braces and teeth. Dental plaque control can be accomplished in two ways with mechanical and chemical plaque control.[2] Toothbrushing as a mechanical plaque control during orthodontic treatment should include, besides the use of regular and electric toothbrushes, the use of special orthodontic brushes as well as interdental brushes.[3] At the same time the technique and frequency of brushing are extremely important for improving the indices of oral hygiene.[4] The use of the dental floss allows better removal of the dental plaque in the interdental space, and particularly important for good plaque control in this area is professional dental cleaning as well as regular controls.Daily use of fluoride toothpastes as well as the use of mouthwash solutions as chemical methods of plaque control additionally affect oral hygiene during orthodontic treatment.[5] [6]

Good oral hygiene during orthodontic treatment with fixed appliances and proper-balanced diet provides good oral health in the patient. In addition to the recommended appropriate instructions by the orthodontist, most patients with fixed appliances who are undergoing orthodontic treatment usually can maintain a satisfactory standard of dental plaque control and properly maintained oral hygienein a very short period. Patient motivation throughout the treatment affects oral health, but it tends to decrease in the middle of orthodontic treatment, resulting with worsened oral health, while at the end of treatment it increases due to the approach to the elimination of fixed appliances. [7]

II. Material and Methods

The study included a total of 102 patients who were undergoing orthodontic treatment in a private specialized clinic in Stip, Macedonia. Of the total number of patients, 65 were women and 37 were men, aged 15 to 35 years. Patients were treated by an orthodontist and they personally filled the questionnaire. The questions in the questionnaire were of great importance for oral hygiene during treatment and concerned the type of toothbrush, brushing frequency, type of toothpaste as well as the use of the dental floss, interdental brushes and mouthwash solutions. Patients who filled out the questionnaire below were in the presence of team members who are doing the research, so that if they have some hesitations they can talk to them directly. All patients in this study have been advised of the privacy of their data collected in this process and only those who gave their consent are included in the research.



Age _____ Gender Male / Female

1. Frequency of toothbrushing:
   a) Once a day
   b) Morning and before going to bed
   c) After every meal
2. Selection of toothbrush:
   a) Conventional
   b) Electric
   c) Orthodontics
3. Selection of toothpaste:
   a) Fluoride
   b) Non- fluoride
4. Use of dental floss:
   a) Daily use
   b) Sometimes
   c) Never
5. Use of interdental brushes:
   a) Daily use
   b) Sometimes
   c) Never
6. Use of mouthwash:
   a) Daily use
   b) Sometimes
   c) Never
7. If toothbrush is not available after meals, how do you clean your teeth:
   a) Rinse the mouth
   b) Toothpicks
   c) Other

Figure 1: Questionnaire distributed to patients

Inclusion criteria:

1. Patients undergoing orthodontic treatment with fixed orthodontic appliances;
2. Patients aged 15-35 years;
3. Patients who have agreed to be included in the study and completed the questionnaire.

Exclusion criteria:

1. Patients with clinically apparent gingival inflammation;
2. Patients with dental caries on anterior or posterior teeth observed during orthodontic therapy;
3. Patients who are not regularwith their controls at the orthodontists.

The results of the research were hand-processed, and a specialized computer software - Statistica 9 for Windows and Microsoft Excel 2012 was used. The processed data are shown in graphs and tables.

III. Results

One hundred and two patients treated with fixed appliances were studied. Most of them were femalebetween 15-25 years.**(Table 1)**

Table.1. *Age groups and number of patients in each group*

Gender / Age	15-25	26-35
Male	23	14
Female	40	25

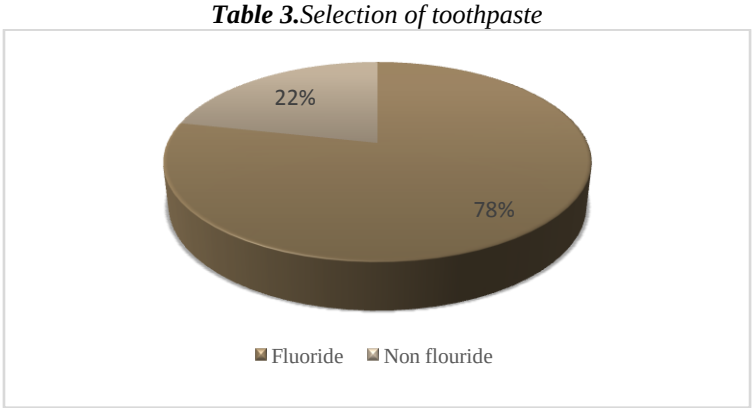
Approximately 66% of the patients clean their teeth in the morning and before going to bed, 24.52% in the morning and 9.8% after every meal. In case of inability to brush after meals, 90.2% rinsed their mouth.**(Table 2)**

Table 2. *Oral hygiene behavior*

Frequency of toothbrushing	
Once a day	24.52%
Morning and before going to bed	65.68%
After every meal	9.8%
If toothbrush is not available after meals how do you cleen your teeth	
Rince the mouth	90.2%
Toothpicks	9.8%
Others	0%

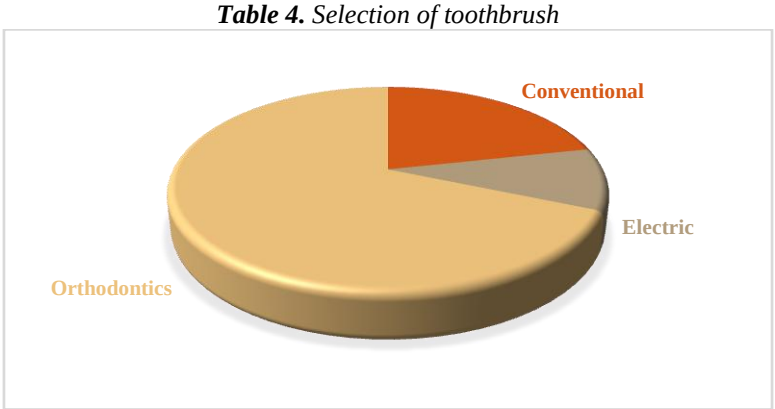
In relation to the oral hygiene behavior after placing fixed appliances, it was found that: 78.43% used fluoride toothpaste and 21.57% used fluoride free toothpaste. **(Table 3)**

Table 3.*Selection of toothpaste*



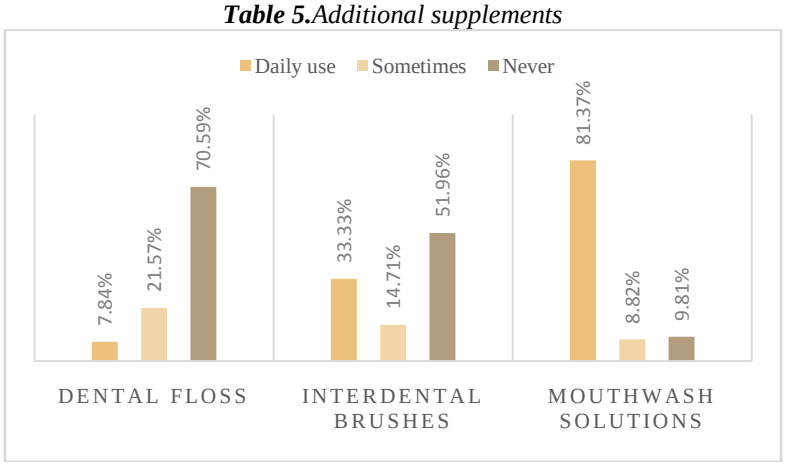
The results of our study showed that out of total 102 patients undergoing fixed orthodontic treatment most of them 68.63% chose orthodontic toothbrush, 21.57% conventional toothbrush and 9.8% chose electric toothbrush to maintain oral hygiene.**(Table 4)**

Table 4. *Selection of toothbrush*



Regarding the supplemental tools, percentage of daily and occasional uses of dental floss were 7.84% and 21.57% (interdental brush 33.33% and 14.71%,mouthwash solutions 81.37% and 8.82%). **(Table 5)**

Table 5.*Additional supplements*



IV. Discussion

Fixed orthodontic appliances contribute to the additional retention of food around brackets, archwires, ligatures, hooks, bands so it is recommended that patients brush their teeth immediately after each meal. During orthodontic treatment, tooth brushing with appropriate toothbrushes represents the first line of defense in the removal of food residues and dental plaque. Kumar et al. (2016) reported that irregular toothbrushing increases the risk of caries compared to regular toothbrushing. In our study, most of the patients brush twice a day, in the morning and evening. The percentage we received for brushing after each meal is very small, unsatisfactory and is due to the need to wear a toothbrush with them if they are out or not in their home. In this case, it is recommended that the patient rinses the mouth with water. In our study, 90.2% of patients who can not brush their teeth after a meal, rinse their mouth with water, while 9.8% use toothpick. It is necessary to educate patients and explain to them how improper use of toothpick can lead to gum abrasion. Patients during orthodontic treatment need to avoid sticky and tough foods because these foods easily engage in fixed orthodontic appliances, especially if patients can not immediately brush their teeth after the meal. Patients who wear fixed appliances need to be trained to properly maintain oral hygiene and their brushing techniques have to be checkedregularly.

In terms of the choice and use of the toothbrush in this study, the majority of patients -68.63% use an orthodontic toothbrush. These results correspond to other studies where also the largest percentage of patients used this type of brush during orthodontic treatment.[8] The orthodontic toothbrush is in two levels, in the form of V with longer bristlesat the ends and shorter bristles in the middle. This form enables removing the dental plaque of brickets and teeth, that is, the area above and below the brickets. Studies relating to the effectiveness of the use of orthodontic toothbrushes compared to conventional toothbrush for plaque removal have received contradictory results. [9] [10]Other studies have shown that electric toothbrushes are very effective in removing plaque and food residues, but manual toothbrushes, if used properly with appropriate frequency, technique and duration, are also effective. [11] In fact, a study concluded that patients with poor oral hygiene can benefit from electric toothbrushes as work with them is easy and quick. [12] Our study showed that most patients - 78.43% use fluoride toothpastes, a percentage that is consistent with other studies, where in one of them the use of fluoride toothpastes is 82%, which is also a high percentage. [8] Fluoride toothpaste affects the prevention of dental caries, and is even more effective when used twice a day.From the additional supplementsused to maintain oral hygiene, our study showed that the use of interdental brushes and mouthwash solutions is more common than the use of dental floss. It has also been reported that interdental brushes have a greater effect on the interaproximal cleaning of the dental plaque compared to the dental floss. [13] Although the daily use of interdental brushes in patients is more common, the percentage is still small (33.33%) and points to the need for increased patient education for the role of these additional supplementsand the benefits they have. Daily use of dental floss and interdental brushes is recommended. Waerhaug reported that the use of interdental brushes allows the removal of the subgingival plaque to a depth of 2 to 2.5 mm. [14] In this study, daily use of dental floss is only 7.84%.

Many studies have shown that the proper use of the dental floss in patients with fixed orthodontic appliances affects the health of the inter-proximal gingiva. [15]

However, the daily use of the dental floss by patients in numerous studies shows low percentages. [16] The dental floss has his disadvantages for use during orthodontic treatment in patients with fixed appliances as it presents a challenge to use. It's harder to reach the gums through the archwires, it is more difficult to manipulate it rather than in untreated patients with orthodontic fixed appliances. In certain studies where the removal of dental plaque is compared with the interdental brushes, they have proved to be better.[17] [18] In terms of the

use of mouthwash solutions, 81.37% of the patients use them daily and it is a pleasure to see that these supplements, that are of huge importance for oral hygiene, are represented in a highpercentage. Oral health is one of the most important components for the general health of the patient and for the quality of his life. In the future, dentists need to strengthen the importance of proper toothbrushing and the use of additional supplements for oral hygiene.[19] Oral hygiene is more difficult to maintain in patients undergoing orthodontic treatment with fixed appliances and it is therefore necessary for orthodontists to provide proper education.

V. Conclusion

Based on the findings of this study, it is obvious that patients wearing orthodontic appliances have problems maintaining good oral hygiene. Although the respondents in this study showed good results with respect to some means of maintaining oral hygiene, however, for most of the supplemental tools the percentage was low. This points to the need of strengthening their promotion, as well as increased education from orthodontists and dental hygienists. Oral hygiene instructions are necessary throughout the entire orthodontic treatment and they need to be strengthened. At the very beginning of the orthodontic treatment, the therapist should motivate patients in order for the oral hygiene to be at a high level throughout the entire treatment.

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References

[1]. Bishara, S. E. and Ostby, A. W. (2008) 'White spot lesions: formation, prevention, and treatment', Seminars in Orthodontics, 14, pp. 174-182.
[2]. Needleman, I., Nibali, L. & Di Iorio, A. (2015) Professional mechanical plaque removal for prevention of periodontal diseases in adults– systematic review update. Journal of Clinical Periodontology 42 (Suppl 16), S12–S35.
[3]. Salzer, S., Slot, D. E., Van der Weijden, F. A. &Dorfer, C. E. (2015) Efficacy of inter-dental mechanical plaque control in managing gingivitis–a meta-review. Journal of Clinical Periodontology 42 (Suppl 16), S92–S105.
[4]. Kumar, S., Tadakamadla, J. & Johnson, N. W. (2016) Effect of toothbrushing frequency on incidence and increment of dental caries: a systematic review and meta-analysis. Journal of Dental Research 95, 1230–1236.
[5]. Gunsolley, J. C. (2006) A meta-analysis of sixmonth studies of antiplaque and antigingivitis agents. Journal of the American Dental Association 137, 1649–1657.
[6]. Serrano, J., Escribano, M., Roldan, S., Martin, C. & Herrera, D. (2015) Efficacy of adjunctive anti-plaque chemical agents in managing gingivitis: a systematic review and meta-analysis. Journal of Clinical Periodontology 42 (Suppl 16), S106–S138.
[7]. Lauren E. Anderson, Airton Arruda and Marita Rohr Inglehart. (2009) Adolescent Patients' Treatment Motivation and Satisfaction with Orthodontic Treatment. *The Angle Orthodontist* 79:5, 821-827.
[8]. Anuwongnukroh N, Dechkunakorn S, Kanpiputana R (2017) Oral Hygiene Behavior during Fixed Orthodontic Treatment. Dentistry 7: 457. doi:10.4172/2161-1122.1000
[9]. Williams P, Fenwik A, Schou L, Adams W (1987) A clinical trial of an orthodontic toothbrush. Eur J Orthod 9: 295-304.
[10]. Kiliçoğlu H, Yildirim M, Polater H (1997) Comparison of the effectiveness of two types of toothbrushes on the oral hygiene of patients undergoing orthodontic treatment with fixed appliances. Am J Orthod Dentofacial Orthop 111: 591-594
[11]. Yaacob M, Worthington HV, Deacon SA, Deery C, Walmsley AD, et al. (2014) Powered versus manual toothbrushing for oral health. Cochrane Database Syst Rev 6: CD002281.
[12]. Heintze SD, Jost-Brinkmann PG, Finke C, Miethke RR. Ortho-plaque Index. In: Oral health for the orthodontic patient. Chicago: Quintessence; 1999. p. 67-70.
[13]. Christou V, Timmerman MF, Van der Velden U, Van der Weijden FA (1998) Comparison of different approaches of interdental oral hygiene: interdental brushes versus dental floss. J Periodontol 69: 759-764.
[14]. Waerhaug J. The interdental brush and its place in operative and crown and bridge dentistry. J Oral Rehabil. 1976; 3(2):107-13
[15]. Zanata Fabricio MC, Cassiano R (2011) Association between dental floss use and gingival conditions in orthodontic patients. Am J Orthod and Dentofacial Orthop 140: 812-821.
[16]. Atassi F, Awartani F. Oral Hygiene Status among Orthodontic Patients. J Contemp Dent Pract [Internet]. 2010 July; 11(4):025-032.
[17]. Imai P, Yu X, MacDonald D (2012) Comparison of interdental brush to dental floss for reduction of clinical parameters of periodontal disease: A systematic review. Can J Dent Hygiene 46: 63-78.
[18]. Ishak N, Watts T (2007) A comparison of the efficacy and ease of use of dental floss and interdental brushes in a randomized split mouth trial incorporating an assessment of subgingival plaque. Oral Health Prev Dent 5: 13-18.
[19]. Dayakar, M. M., Kumar, J., Pai, G. P., Shivananda, H., & Rekha, R. 2016. A survey about awareness of periodontal health among the students of professional colleges in Dakshina Kannada District. Journal of Indian Society of Periodontology, 20(1), 67–71. http://doi.org/10.4103/0972-124X.168487

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