

Oral Hygiene Awareness of Patients Undergoing Orthodontic Treatment

Ishika Sinha ¹, Devanshu Sinha ²  

¹ Department of Orthodontics and Dentofacial Orthopedics, AB Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangalore, Karnataka, India

² Department of Oral and Maxillofacial Surgery, SRM Kattankulathur Dental College and Hospital, Potheri, Chengalpattu District, Tamil Nadu, 603203, India

 **Corresponding author:**

Devanshu Sinha, Department of Oral and Maxillofacial Surgery, SRM Kattankulathur Dental College and Hospital, Potheri, Chengalpattu District, Tamil Nadu, 603203, India

devanshusinha456@gmail.com

Article History

Received: 20 April 2023

Accepted: 5 March 2023

Abstract

Background and Aim: Considering the significance of oral hygiene maintenance during orthodontic treatment, this study aimed to assess the oral hygiene awareness of patients undergoing orthodontic treatment and evaluate how compliant the patients are to the oral hygiene instructions given to them by dentists.

Materials and Methods: Two researcher-designed questionnaires were used for assessment of oral hygiene awareness. One was given to patients between 12-40 years undergoing orthodontic treatment to assess the oral hygiene awareness of patients, and the other questionnaire was given to general dentists and orthodontists to assess their awareness regarding the provision of patients with ideal oral hygiene instructions. Each questionnaire consisted of 15 questions, and the study was conducted from June 2021 to August 2021. The questionnaires were administered online to 200 orthodontic patients and 200 dentists of various colleges in Tamil Nadu. Both male and female patients were included. The validity of the questionnaires was confirmed by a content validity index of 0.73.

Results: Averagely 40% of patients did not follow the instructions given by their dentists and hence were unaware of oral hygiene maintenance measures during orthodontic treatment. The majority of patients (77%) were compliant to regular monthly appointments. Also, females were more concerned and more aware of how to maintain a good oral health, as compared to males.

Conclusion: In the present study, most patients were compliant to their regular appointment schedules. A considerable number of patients did not follow the instructions given by their dentists and hence remained unaware of oral hygiene maintenance measures during orthodontic treatment.

Key Words: Oral Hygiene; Orthodontic Appliances; Appointments and Schedules

Cite this article as: Sinha I, Sinha D. Oral Hygiene Awareness of Patients Undergoing Orthodontic Treatment.

J Res Dent Maxillofac Sci. 2023; 8(2):138-143.

Introduction

Malocclusion or malalignment of teeth is one of the main causes of poor esthetics and a major contributing factor to poor oral hygiene. After dental caries, malocclusion is the second most common dental condition in adolescents and preadolescents [1]. Malocclusion refers to

a deviation from the normal dentofacial state. Orthodontic treatment is commonly performed for correction of malocclusion. Also, with the increasing concerns about esthetics, orthodontic treatment has become more popular in the recent times [2]. Fixed orthodontic appliances can improve esthetics,

reinstate normal occlusion, and thereby make it easy for patients to maintain their oral hygiene post-treatment [3]. However, in active orthodontic treatment, arch wires, brackets, and elastics act as primary retention sites for debris and plaque accumulation and further increase the risk of dental caries and periodontal disease [4].

Hence, it is the duty of orthodontists to instruct various oral hygiene maintenance measures to patients during their active treatment while correcting their dentofacial anomalies [5]. Thus, greater emphasis should be placed on education of orthodontic patients to improve their oral hygiene and periodontal health [6].

Aside from the instructions given by professionals, patient compliance is another major factor for success of orthodontic treatment. After commencement of treatment, there may be a hindrance in oral hygiene practice by patients.

Poor oral hygiene has a negative impact on overall dental and periodontal health and may cause failure of orthodontic treatment [7]. For patients to maintain a good oral health, orthodontists must provide them with regular instructions at every visit [8].

Accurate toothbrushing technique, regular toothbrushing, and appropriate use of orthodontic brushes, interdental brushes, and mouthwashes need to be taught to patients for adequate oral hygiene [9]. Poor maintenance of oral hygiene is either due to lack of knowledge, negligence of patients, or improper instructions given to them. However, despite receiving appropriate instructions, many individuals fail to follow the instructions. Patients must be kept reminded of maintaining their oral hygiene at every visit and must receive continuous education about the correlation of good oral health and successful orthodontic treatment.

The present study aimed to assess the oral hygiene awareness of patients undergoing

orthodontic treatment and evaluate how compliant the patients are to the oral hygiene instructions given to them by dentists.

Materials and Methods

This descriptive study was conducted on orthodontic patients presenting to the Department of Orthodontics of various colleges in Tamil Nadu. The study was conducted after obtaining ethical clearance from the Institutional Review Board (3011A/IEC/2021). Two researcher-designed questionnaires on oral hygiene awareness were used in this study. The reliability of the questionnaires was confirmed by two specialists. The content validity ratio was calculated for assessment of the validity of the questionnaires which was found to be 0.73. One questionnaire was given to patients aged 12-40 years undergoing orthodontic treatment to assess the oral hygiene awareness of patients. Patients seeking orthodontic treatment are commonly between 12-40 years; hence, this age group was selected for this study. The questions were multiple-choice, easy to understand, and brief. All patients were asked to fill the introductory questions for ethical purposes, and only after that they were directed to the main questionnaire. The questionnaire was administered evenly among patients with different socioeconomic classes. The second questionnaire was given to general dentists and orthodontists to assess the awareness of professionals regarding the importance of provision of patients with ideal oral hygiene instructions. Informed consent was obtained from each participant before the commencement of the study. Each questionnaire consisted of 15 questions, and the study was conducted from June 2021 to August 2021. The questionnaires were pretested to assess their reliability. The structured questionnaires were administered online through Google forms to 200 orthodontic patients and 200 dentists of

various colleges in Tamil Nadu. Both male and female patients were included. Simple random sampling technique was employed to enroll participants for the study. The sample size was calculated to be 196 assuming the sample reliability value of 0.86, population reliability value of 0.783, power of 95%, and alpha error of 5%.

Inclusion criteria

1. Patients undergoing orthodontic treatment for more than 3 months in the age range of 12-40 years.

Exclusion criteria

1. Patients not undergoing any orthodontic treatment.
2. Dental students undergoing fixed orthodontic treatment to avoid bias.

The completed questionnaires underwent statistical analysis using SPSS version 2.0. All variables were analyzed descriptively.

Results

This study was conducted by using two online questionnaires sent to 200 patients between 12-40 years with a mean age of 23.9 years and 200 dentists. The response rate for the questionnaires sent to patients and dentists was 100% and 96%, respectively. Of all patients, 48.5% were females and 51% were males; 0.5% of patients preferred not to disclose their gender.

The questionnaire sent to patients revealed that 30% of orthodontic patients followed the proper method of toothbrushing and flossing, and the remaining patients brushed and flossed at their convenience without following the ideal method. Forty-two percent of patients noticed an improvement in their oral hygiene status after every appointment and the remaining felt a deteriorated oral health status. Of all, 35% to 45% of patients followed the instructions for dental flossing and use of interdental brush, and 30% of patients used mouthwash. Almost 60% of patients followed the instructions for toothbrushing twice daily. Of all, 77% of patients regularly attended their

monthly appointments. The majority of patients did follow regular monthly appointments but did not strictly adhere to their dentists' instructions (Figure 1).

Almost 60% of patients experienced no halitosis or gingival bleeding during their orthodontic treatment. Forty-eight percent of patients stated that after starting their orthodontic treatment, their oral hygiene was compromised. Almost 50% of patients noticed an improvement in their oral hygiene status whereas the remaining 50% experienced some hindrance in proper maintenance of oral health.

As shown in Figure 1, comparison of oral hygiene awareness between males and females revealed that out of 200 patients, only 116 (58%) brushed twice daily and among them, 33% were females and 25% were males.

Almost equal proportion of males and females followed the combination technique of toothbrushing (i.e., brushing in all directions). Females seemed to be more aware of their oral hygiene practice as they tended to be more disciplined in changing their toothbrush every 3 months as compared to males. Almost 30% of females tended to use dental floss and interdental brush. Equal number of males and females found some difficulty in maintaining good oral hygiene status after initiation of orthodontic treatment.

The questionnaire sent to dentists revealed that 81% of professionals demonstrated the proper method of toothbrushing and flossing to patients, and 65% of dentists noticed an improvement in oral hygiene of patients due to regular treatment follow-ups leading to improvement in alignment of teeth and thereby making it easier for patients to maintain their oral hygiene (assessment of oral hygiene status after every appointment). Of all, 80-85% of dentists prescribed the use of dental floss and interdental brush. Also, 50% of dentists recommended the use of mouthwash. Moreover, 70% of dentists recommended their patients to brush twice daily (Figure 1)

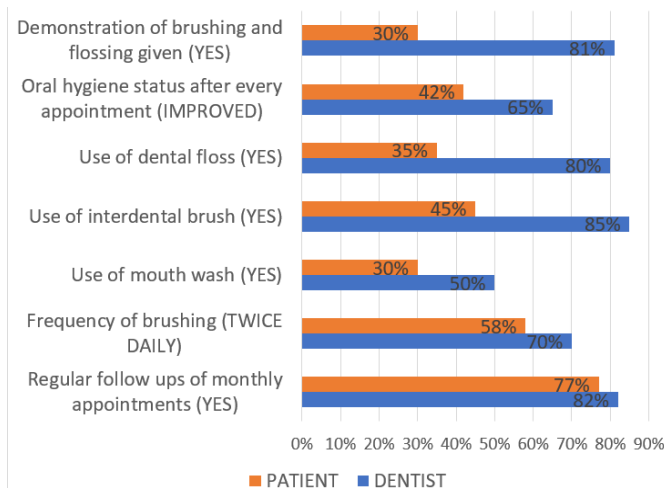


Figure 1. Oral hygiene instructions given by dentists and patients under orthodontic treatment

Discussion

In the present study, most patients attended their regular appointment schedules but a considerable number of patients did not follow the instructions. Most dentists were aware of the significance of oral hygiene maintenance during orthodontic treatment. However, oral hygiene instructions by dentists during orthodontic treatment should be more emphasized.

Sadly, most of the patients undergoing orthodontic treatment are unaware of the fact that negligence on oral hygiene can compromise their overall oral and periodontal health [10]. Despite proper guidance, many patients do not strictly follow the tooth brushing and flossing measures demonstrated to them by professionals. Due to the negligence of patients, they may find maintenance of oral hygiene slightly difficult.

Flossing can greatly prevent food impaction and therefore, improve periodontal health and decrease the prevalence of interproximal caries. The present results regarding limited usage of dental floss by patients were also in accordance with the results of a study by Kapoor et al. [11] where only 20% patients used dental floss as an interdental cleaning tool.

The V shaped and Stage tooth brush is effective for orthodontic patients [12]. A good majority of patients abided by the toothbrushing instructions. Also, females were more obedient since of 58% of patients that brushed their teeth twice daily, 33% were females. The majority of males brushed their teeth only once daily. This result was almost similar to the findings of Nadar and Saravana Dinesh [13] who showed that 48% of patients brushed twice daily, of which, 25% were males and 72% were females. This finding further confirms that females maintained their oral hygiene better than males. Brushing twice daily is always recommended especially for orthodontic patients as it helps to remove food debris accumulated in the brackets and can initiate dental caries if not removed. Orthodontists must also give dietary instructions to patients at each follow-up appointment [14].

In the present study, only 39% of patients changed their toothbrush once every 3 months; out of which 25% were females. The remaining population changed their toothbrush once every 6 months or once it was worn out.

With respect to the brushing technique, the results showed that 38% of patients followed a combination of circular, horizontal, and vertical brushing movements; whereas, 30% used vertical motion and the remaining reported using horizontal and circular movements.

An interdental brush is recommended by orthodontists as it can very well clean the gaps between the tooth and archwire, but only 45% of patients correctly used it. The present results were a little more optimistic compared with the results of Lee et al. [15] where only 14.4% of patients used the interdental cleaning aid. The present results were similar to the findings of another study by Jacob et al. [16] where 25.3% of participants reported using interdental aids; whereas, 57.3% reported not using them.

Equal proportion of males and females reported using a mouthwash, some for plaque

control and some to combat bad breath. This result was similar to the findings of Nadar and Saravana Dinesh, [13] who showed that 40% of patients used a mouthwash in their study. Chlorhexidine has not shown any superiority for plaque and gingivitis control, and has drawbacks of staining the tooth and having a bad taste [17,18]. However, Listerine mouthwash is a beneficial adjunct to usual oral hygiene practice in orthodontic patients [19].

Most of the patients (approximately 48%) experienced some hindrance in maintaining oral hygiene after the onset of orthodontic treatment. This is because of the brackets and wires in the oral cavity that make it difficult to remove the food debris after each meal and do not allow smooth oral hygiene practice. A study by Baheti and Toshniwal [20] suggested the same and reported a compromised periodontium in orthodontic patients.

Orthodontic treatment can also be performed in patients with poor periodontal health with a proper periodontal evaluation. With completion of orthodontic treatment, patients' periodontal condition must also improve to enable proper oral hygiene maintenance [21]. Risk management is the most important factor for a successful orthodontic treatment in medically compromised patients. For patients with systemic diseases such as cardiovascular disorders, endocrine disorders, bleeding disorders, or medication allergy, accurate medical history and drug history are essential for efficient management [22]. For patients with bleeding disorders, the duration of treatment must be as short as possible. Gingival overgrowth must be excised before commencement of orthodontic treatment [23].

Almost 80% of patients attended their regular monthly orthodontic appointments for the progress of treatment but did not follow the dentists' instructions diligently. Therefore, they may experience deteriorated oral hygiene during orthodontic treatment.

After each appointment, patients' oral health status may be improved if they are

reminded of their oral hygiene maintenance instructions over a text message or phone call [24,25]. Regular check-ups also play a role in oral hygiene status as the patients are given feedbacks about their oral hygiene routine and how they must modify it for a better outcome. The present results were more hopeful than those of a study by Berlin-Broner et al. [26] who reported that only 52% of patients showed up on time for their monthly appointments. During the entire procedure, dentists must employ various motivational strategies to improve their patients' compliance to oral hygiene measures. This can be brought about by chair-side education, video demonstrations, and periodic reminders [27]. Regular oral hygiene practice would guarantee optimal oral health in the course of orthodontic treatment [28].

Conclusion

In the present study, most patients were compliant to their regular appointment schedules, and a considerable number of patients did not follow the instructions and hence remained unaware of the oral hygiene maintenance measures during orthodontic treatment. Therefore, oral hygiene maintenance during orthodontic treatment should be further emphasized.

Acknowledgement

No funding source or agencies.

Conflict of Interest

No conflict of interests.

References

1. Pandey M, Singh J, Mangal G, Yadav P. Evaluation of awareness regarding orthodontic procedures among a group of preadolescents in a cross-sectional study. *J Int Soc Prev Community Dent.* 2014 Jan;4(1):44-7.
2. Atram H, Jakati SV, Namrata K, Hazarey P, Aley M, Chachada A, et al. Survey on awareness about orthodontic treatment in general population of Nagpur district. *Int J Adv Res.* 2017;5(3),500-4.
3. Feliu JL. Long-term benefits of orthodontic treatment on

- oral hygiene. *Am J Orthod.* 1982 Dec;82(6):473-7.
4. Martignon S, Ekstrand KR, Lemos MI, Lozano MP, Higuera C. Plaque, caries level and oral hygiene habits in young patients receiving orthodontic treatment. *Community Dent Health.* 2010 Sep;27(3):133-8.
 5. Antezack A, Monnet-Corti V. Hygiène orale et parodontale chez les patients porteurs de dispositifs orthodontiques [Oral and periodontal hygiene in orthodontic patients]. *Orthod Fr.* 2018 Jun;89(2):181-190.
 6. Li Y, Liu J, Xu Y, Yin J, Li L. Oral Health Self-Management Ability and Its Influencing Factors among Adolescents with Fixed Orthodontics in China: A Mixed Methods Study. *Dis Markers.* 2022 Aug 27;2022:3657357.
 7. Čalušić Šarac M, Anić Milošević S, Matošić Ž, Lapter Varga M. Oral Hygiene Behavior of Croatian Adolescents during Fixed Orthodontic Treatment: A Cross-sectional Study. *Acta Stomatol Croat.* 2021 Dec;55(4):359-66.
 8. Ilyas M, Khalid MU, Arif SQ, Ashraf S. Oral hygiene awareness in orthodontic patients; A cross-sectional survey. *Professional Med J* 2019; 26(6):1000-4.
 9. Lalic M, Aleksic E, Gajic M, Milic J, Malesevic D. Does oral health counseling effectively improve oral hygiene of orthodontic patients? *Eur J Paediatr Dent.* 2012 Sep;13(3):181-6.
 10. Alhaija ESA, Al-Saif EM, Taani DQ. Periodontal health knowledge and awareness among subjects with fixed orthodontic appliance. *Dental Press J Orthod.* 2018 Sep-Oct; 23(5):40.
 11. Kapoor D, Gill S, Singh A, Kaur I, Kapoor P. Oral hygiene awareness and practice amongst patients visiting the Department of Periodontology at a Dental College and Hospital in North India. *Indian J Dent.* 2014 Apr;5(2):64-8.
 12. Atassi F, Awartani F. Oral hygiene status among orthodontic patients. *J Contemp Dent Pract.* 2010 Jul 1;11(4):E025-32.
 13. Nadar S, Saravana Dinesh S P. A questionnaire study about oral hygiene awareness among orthodontic patients. *Int J Orthod Rehabil* 2016;7:97-100.
 14. Aljohani SR, Alsaggaf DH. Adherence to Dietary Advice and Oral Hygiene Practices Among Orthodontic Patients. *Patient Prefer Adherence.* 2020 Oct 20;14:1991-2000.
 15. Lee JH, Abdullah AAA, Yahya NA. Oral hygiene practices among fixed orthodontic patients in a university dental setting. *Int J Oral Dent Health.* 2016;2(2):027.
 16. Jacob AM, Shenoy N, Bhandary R. Oral hygiene awareness and effect of orthodontic treatment on periodontal health among medical students. *Nitte University Journal of Health Science.* 2017;7(2):31-7.
 17. James P, Worthington HV, Parnell C, Harding M, Lamont T, Cheung A, Whelton H, Riley P. Chlorhexidine mouthrinse as an adjunctive treatment for gingival health. *Cochrane Database Syst Rev.* 2017 Mar 31;3(3):CD008676.
 18. Adams D, Addy M. Mouthrinses. *Adv Dent Res.* 1994 Jul;8(2):291-301.
 19. Alshehri FA. The use of mouthwash containing essential oils (LISTERINE®) to improve oral health: A systematic review. *Saudi Dent J.* 2018 Jan;30(1):2-6.
 20. Baheti MJ, Toshniwal NG. Survey on oral hygiene protocols among orthodontic correction-seeking individuals. *J Educ Ethics Dent* 201.
 21. Gurkeerat S, Izhar A, Monika Dahaiya, Varun Goyal, Raj Singh, Nishant Gupta. Orthodontic Management of Periodontally Compromised Adult Patients-A Case Series. *Journal of Contemporary Orthodontics.* 2019;3(1):1-5.
 22. Kumar I G, Raghunath N, Jyothikiran H, Ravi S, Pradeep S. Influence of chronic congenital systemic disorder effects in orthodontic treatment. *Int J Orthod Rehabil* 2020;11:123-35.
 23. Burden D, Mullally B, Sandler J. Orthodontic treatment of patients with medical disorders. *Eur J Orthod.* 2001 Aug; 23(4):363-72.
 24. Cozzani M, Ragazzini G, Delucchi A, Mutinelli S, Barreca C, Rinchuse DJ, Servetto R, Piras V. Oral hygiene compliance in orthodontic patients: a randomized controlled study on the effects of a post-treatment communication. *Prog Orthod.* 2016 Dec;17(1):41.
 25. Eppright M, Shroff B, Best AM, Barcoma E, Lindauer SJ. Influence of active reminders on oral hygiene compliance in orthodontic patients. *Angle Orthod.* 2014 Mar;84(2):208-13.
 26. Berlin-Broner Y, Levin L, Ashkenazi M. Awareness of orthodontists regarding oral hygiene performance during active orthodontic treatment. *Eur J Paediatr Dent.* 2012 Sep; 13(3):187-91.
 27. Huang J, Yao Y, Jiang J, Li C. Effects of motivational methods on oral hygiene of orthodontic patients: A systematic review and meta-analysis. *Medicine (Baltimore).* 2018 Nov;97(47):e13182.
 28. Dubey R, Jalili VP, Garg S. Oral hygiene and gingival status in orthodontic patients. *J Pierre Fauchard Acad.* 1993 Jun; 7(2):43-54.