

Access this article online

Quick Response Code:



Website:

www.jorthodsci.org

DOI:

10.4103/jos.jos_116_22

A cross-sectional study into the reasons behind orthodontic re-treatment

Nada E. Tashkandi, Sara A. Asiri¹, Raneem A. Al Bin Ali², Amal Z. Maalawi², Sumaia H. Alwan², Shaden M. Alabood² and Ruba M. Alsharif²

Abstract

OBJECTIVE: This study aims to identify the motivations behind orthodontic re-treatment in Saudi Arabia.

MATERIALS AND METHODS: This is a cross-sectional study performed through a patient questionnaire. The questionnaire elicited data on the respondents' socio-demographic data, type of previous orthodontic treatment, retention, satisfaction level, and reasons for undergoing orthodontic re-treatment.

RESULTS: Four hundred and nineteen responses were received during the study period from June to July 2022. The result showed a pre-dominant female predilection (83, 29%), with the majority belonging to the 21–25 age group (47.26%). Most participants had had one previous orthodontic treatment (77%), with an active treatment time of approximately 1–3 years (55.85%). There was no significant difference between the satisfaction of outcomes after the initial treatment and at the time of the survey. Most participants received retention appliances (69.45%) and were informed about the importance of appliances. The type of retention was mainly removable retainers (47.5%). Around one-third of the sample (31.98%) were interested in seeking orthodontic re-treatment, with self-motivation as the primary drive and improving the smile as the predominant reason.

CONCLUSION: The study's findings show that a large portion of the population is seeking orthodontic re-treatment, which must be considered. Self-motivation was a driving force rather than external motivation. The most common reason for seeking orthodontic re-treatment was to improve their smile and the increased esthetic demand.

Keywords:

Orthodontic re-treatment, relapse, retainer

Introduction

Orthodontics is the branch of dentistry that deals with facial growth and dental abnormalities. The final phase of orthodontic treatment is retention.^[1] This phase aims to maintain the aesthetic and functional tooth positions after orthodontic treatment and reduce the tooth's tendency to return to its original position.^[2] Since 1904, the importance of maintaining tooth alignment after orthodontic treatment to

avoid relapse has been recognized.^[3] This is achieved by holding the teeth in their new position for a period to prevent relapse due to pressure exerted by soft tissue and continued growth. Relapse may happen due to remodeling periodontal tissues, muscular imbalances, or changes produced by growth and aging.^[2] The tendency to relapse or post-treatment undesired tooth movement varies based on these factors.^[2]

Many types of retainers can be used in orthodontic treatment, including bonded retainers, removable acrylic

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Tashkandi NE, Asiri SA, Al Bin Ali RA, Maalawi AZ, Alwan SH, Alabood SM, *et al.* A cross-sectional study into the reasons behind orthodontic re-treatment. J Orthodont Sci 2023;12:56.

Department of
Orthodontics, Faculty
of Dentistry, Riyadh
Elm University, Riyadh,

¹Faculty of Dentistry, King
Abdulaziz University,
Jeddah, ²Faculty of
Dentistry, King Khalid
University, Abha,
Saudi Arabia

Address for correspondence:

Dr. Nada E. Tashkandi,
Department of
Preventative Dentistry,
Riyadh-Elm University,
Riyadh, Saudi Arabia.
E-mail: Nada.Tashkandi@
riyadh.edu.sa

Submitted: 04-Dec-2022

Revised: 18-Jan-2023

Accepted: 19-Jan-2023

Published: 04-Sep-2023

retainers (Hawley retainers), vacuum-formed retainers (VFR), and spring retainers. VFR is considered an aesthetic appliance, but patients' compliance rate is more with Hawley than VFR due to the occlusal coverage of the VFR leading to speech impairment (Al-Jewair *et al.*, 2016).^[4] Multiple factors affect the stability of orthodontic treatment, such as the type of malocclusion, age, gender, pathology of the surrounding soft tissues, patient compliance, and the retention protocol applied.^[2] During the retention phase, the patient should have regular checkups to follow compliance and adjust the appliance if needed.

With current trends of increasing esthetic demands, greater emphasis is placed on maintaining the stability of treatment results.^[2] Retention is important in determining long-term patient satisfaction and is a necessary and mandatory component of orthodontic treatment.^[3] In this study, the main purpose was to determine the reasons that lead patients to seek orthodontic re-treatment.

Materials and Method

This cross-sectional study was conducted in June–July 2022 through a patient questionnaire created using Google Forms distributed online throughout multiple regions in Saudi Arabia. The Research Ethics Committee at Riyadh Elm University, Saudi Arabia, approved the study (SRP/2022/108/759/725). Informed written consent was obtained from each study subject included in the study after an explanation of the study's purpose. The respondents' privacy and anonymity were maintained, along with the confidentiality of the collected data.

The survey was designed in a prospective form that targeted patients seeking orthodontics re-treatment or who have already undergone orthodontic treatment. The data were collected through an online questionnaire with multiple-choice and closed-ended questions. The questionnaire was based on previous work and research conducted by Santiago *et al.*^[3,5] and Chow *et al.* (2020)^[6] and was modified to suit the objectives of our study and written in both Arabic and English languages to accommodate the intended population. The questionnaire elicited data on the subjects' socio-demographic data, type of previous orthodontic treatment, retention, satisfaction level, and reasons for undergoing orthodontic re-treatment.

Results

The total collected samples were 419 responses with a strong female predilection; a female-to-male ratio of 349:70. The majority (47.26%) of the sample was

21–25 years old and from the Southern region of Saudi Arabia (57.52%). Most of the population studied preferred to answer the questionnaire in Arabic (87.59%). The demographic data are detailed below in Table 1.

Concerning the previous orthodontic treatment provided, 323 (77%) had one previous treatment, 76 (18.1%) had two, and 20 (4.78%) had more than two orthodontic treatments. Of the collected sample, only 329 (78.5%) admitted they had completed the prescribed treatment. The ages at the beginning of treatment ranged from 8 to 44 years, with an average of 18.1 years. The active treatment time was categorized into <1 year (n = 126, 30%), 1–3 years (n = 234, 55.85%), and >3 years (n = 59, 14%). Furthermore, the time since orthodontic treatment has been completed was categorized into <6 months (n = 74, 17.66%), 6–24 months (n = 80, 19.09%), 2–5 years (n = 119, 28.4%), and >5 years (n = 146, 34.84%).

The average self-reported score (0–10) of their satisfaction with the outcome after the initial treatment was 7.47 ± 2.64 and was 7.08 ± 2.5 at the time of the survey. Most of the sample (291, 69.45%) had received a retention appliance at the end of treatment, with 80 (19.09%) respondents claiming not to have received any and 48 (11.46%) respondents who could not remember. This ratio was also mirrored when asked if they had received information on the importance of retention, with 291 (69.45%) answering "yes," 76 (18.14%) answering "no," and 52 (12.41%) unsure.

Most cases were treated with fixed (n = 373, 89%) rather than removable (n = 46, 10.98%) appliances. However, when asked about the type of retention, 42 (10%) had fixed retainers, 199 (47.49%) had removable retainers, 87 (20.76%) had both, and 91 (21.72%) were unsure of the retention appliance. Retainer frequency and duration results are shown in Table 2.

There was an almost equal split between those interested in re-treatment (n = 134, 31.98%) and those not interested

Table 1: Demographic data

Variable	Values	Total number	Percentage
Gender	Male	70	16.71
	Female	349	83.29
Age	<20	56	13.37
	21-25	198	47.26
	26-30	71	16.95
	>30	94	22.43
Region	Eastern	27	6.44
	Western	67	15.99
	Central	69	16.47
	Northern	15	3.58
	Southern	241	57.52
Language preference	Arabic	367	87.59
	English	52	12.41

(n = 147, 35.08%). The remaining samples were either unsure (n = 89, 21.24%) or had undergone orthodontic re-treatment (n = 49, 11.69%). The motivation and reasons behind the drive toward re-treatment are shown in Figures 1 and 2.

Discussion

A rise in the number of patients seeking orthodontic treatment has coincided with an increase in the number of individuals seeking orthodontic re-treatment over the previous several years.^[5] However, there is still ambiguity about the reasons behind seeking re-treatment among those patients, especially in Saudi Arabia, where there is insufficient literature. This study's findings will help orthodontists define the characteristics of those patients, their motivation, and their reasons for seeking re-treatment.^[7,8]

Most patients who undergo or seek orthodontic re-treatment are females, as confirmed by the strong female-to-male predilection detected in this study. Previous studies have shown females to consider straight teeth more important than males.^[7] In this study, as expected by previous studies, the majority (47.26%) of the respondents were between 21 and 25 years old (n = 198). This age range has been proven to have the most concerns about facial and dental aesthetics, and

it is also the greatest in having good compliance with wearing retainers.^[3,9] Most of the respondents were from the southern region of Saudi Arabia. However, this was subject to the distribution of the survey.

As mentioned in the results, most cases were treated with fixed appliances rather than removable appliances. A previous systematic review collected data about the post-treatment stability for 1–3 years post-treatment for both fixed and clear aligner treatments and found that the cases treated with clear aligners had a higher rate of relapse.^[10] However, another systematic review and meta-analysis done by Zheng disagreed and concluded that there were no differences in occlusal stability between these systems.^[11]

In this research, 69.45% (n = 291) of the respondents were informed about the importance of wearing the retainer, while 18.14% (n = 76) of them claimed that they did not receive any information about its importance and 12.41% (n = 52) were not sure. The last two groups can show us how much of an impact the discussion between patients and professionals may have on the stability of the results and the need for orthodontic re-treatment.^[5] Furthermore, a lack of this discussion can lead to compromised outcomes and an increase in the number of patients seeking re-treatment, where the stability of treatment outcomes mainly depends on patient compliance with the instructions given by the orthodontist. This coincides with previous studies that reported that the most successful treatment outcomes were seen in patients who were aware of the importance of retainer wearing and were in greater compliance with the instructions for sufficient duration and frequency.^[3,5] On the other hand, patients who did not receive enough information about the use of a retainer or who had a lack of information had their retainer compliance diminish after a short period.^[3,5]

The choice of orthodontic retention is influenced by several factors, including the orthodontist's preference, the relationships of occlusal, skeletal, and soft tissues, different methods of retention, and many variations

Table 2: Retainer frequency and duration of wear

Retainer frequency of wear	Count	Percentage
Never	n=94	22.43%
Once a month	n=22	5.25%
Once a week	n=21	5.01%
Several times a week	n=36	8.59%
Every night	n=98	23.39%
Full time	n=148	35.32%
Retainer duration of wear	Count	Percentage
Never	n=96	22.91%
1–3 months	n=95	22.67%
3–6 months	n=62	14.80%
6–12 months	n=85	20.29%
Until now	n=81	19.33%

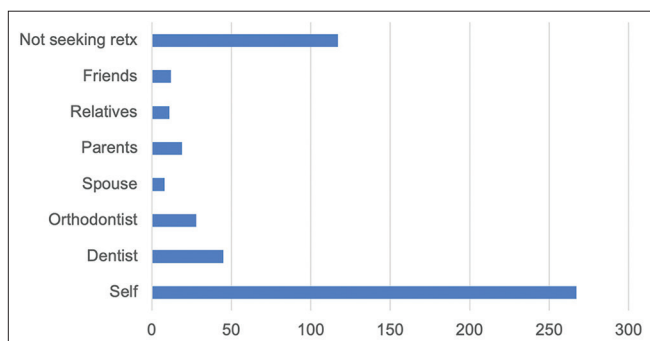


Figure 1: Sources of motivation for re-treatment

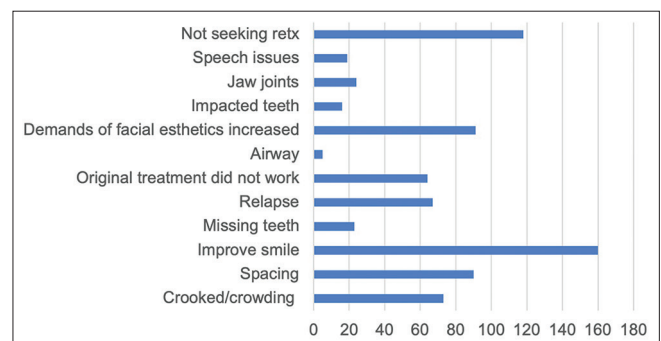


Figure 2: Reasons for re-treatment

in retention strategies. All these factors challenge the choice of retention protocol as well as the sparsity of well-controlled scientific studies.^[12] (Littlewood *et al.*, 2017).^[13] The duration and frequency of retainer wear continue to be controversial topics among orthodontists, and it is impossible to establish a 'one size fits all' approach to retention, with a wide variation in the complexity and severity of patients' malocclusions and their orthodontic treatment (Littlewood, 2006).^[14] A Cochrane review carried out in 2006 concluded that there was insufficient research data to base clinical practice on retention. So there continues to be minimal agreement on the most appropriate approach to adopt in an individual case. With a trend in orthodontics toward non-compliant methods of treatment, orthodontists have been found to prefer fixed, bonded retainers to reduce the dependence on patient compliance (Singh *et al.*, 2009).^[15] However, more patients in this study used removable retainers (n = 199, 47.49%) than fixed retainers (n = 42, 10%).

Although studies have supported the concept of lifetime retention, the majority continue to share the view that the optimal time interval for the first retention period should be at least 1 year to reduce unpredictable and unwanted post-treatment changes (Zachrisson, 2007),^[12,16] (Littlewood *et al.*, 2017).^[13] This is based on histological studies, which have shown that the supra-crestal periodontal fibers remain stretched and displaced for more than 7 months after cessation of orthodontic tooth movement (Reitan and Edwards). According to this study, only 20.29% (n = 85) of patients wore the retainer for the minimally recommended retention period (6–12 months). A study by Ren *et al.* reported that a longer duration of retainer use was a protective factor for relapse.^[7]

In this study, the authors investigated the satisfaction level of the patients with a score out of 10, and the average was 7.47 ± 2.64 after the initial treatment and 7.08 ± 2.5 at the time of the survey. The highest source of motivation for re-treatment was reported as self-motivation, which agrees with a previous study that it was strictly a personal and self-motivated decision.^[5] (Chow *et al.*, 2020). Many patients seek re-treatment because they want to improve their smile and appearance, and this has been shown to be correlated with an improved social life and professional status.^[8] This research was limited by the ability to distribute the survey in different regions in Saudi Arabia and the limited time allocated to collect the data.

Conclusion

Patients who underwent orthodontic treatment have more awareness of their dental and facial aesthetics,

thus showing an increased demand for orthodontic re-treatment. Most of the respondents were young adults with high self-motivation. Also, it showed that most of them were informed about the importance of wearing their retainer. The most common reasons for seeking re-treatment among those patients were to improve their smile and increase their facial aesthetics. Emphasizing good communication between the patient and orthodontist will highly improve the outcomes of treatment, thus reducing re-treatment in the future.

Acknowledgments

We would like to thank the Riyadh Elm University Summer Research School for providing us with the opportunity and resources to conduct this research.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Outhaisavanh S, Liu Y, Song J. The origin and evolution of the Hawley retainer for the effectiveness to maintain tooth position after fixed orthodontic treatment 5compare to vacuum-formed retainer: A systematic review of RCTs. *Int Orthod* 2020;18;225-36.
2. Jedlinski M, Grocholewicz K, Mazur M, Janiszewska-Olszowska J. What causes failure of fixed orthodontic retention?-systematic review and meta-analysis of clinical studies. *Head Face Med* 2021;17:32.
3. Aldosari M, Alrahmah W, AL Hammad F, Alhmadi R, Ansari S, Alzahrani K. Patient experience and satisfaction of orthodontic retention after treatment in Saudi Arabia. *Int J Innov Res Med Sci* 2021;6:512-8.
4. Al-Jewair TS, Hamidaddin MA, Alotaibi HM, Alqahtani ND, Albarakati SF, Alkofide EA, *et al.* Retention practices and factors affecting retainer choice among orthodontists in Saudi Arabia. *Saudi Med J* 2016;37:895-901.
5. Santiago RC, Da Silva Campos MJ, Vitral RW, Vieira RA, Nojima LI, Sant'anna EF. Characteristics of patients seeking orthodontic re-treatment. *J World Fed Orthod* 2022;11:36-40.
6. Chow L, Goonewardene MS, Cook R, Firth MJ. Adult orthodontic retreatment: A survey of patient profiles and original treatment failings. *Am J Orthod Dentofacial Orthop* 2020;158:371-82.
7. Ren Y, Boxum C, Sandham A. Patients' perceptions, treatment need, and complexity of orthodontic re-treatment. *Eur J Orthod* 2009;31:189-95.
8. Saccomanno S, Saran S, Laganà D, Mastrapasqua R, Grippaudo C. Motivation, perception, and behavior of the adult orthodontic patient: A survey analysis. *Biomed Res Int* 2022;2022:2754051.
9. Abeskharon A, Fischer M, Burnheimer J. Compliance with retainer wear in the first year: An analysis of 320 cases. *J World Feder Orthod* 2018;7:13-6.
10. Yassir Y, Nabbat S, McIntyre G, Bearn D. Clinical effectiveness of clear aligner treatment compared to fixed appliance treatment: An overview of systematic reviews. *Clin Oral Investig* 2022;26:2353-70.
11. Zheng M, Liu R, Ni Z, Yu Z. Efficiency, effectiveness and treatment

- stability of clear aligners: A systematic review and meta-analysis. *Orthod Craniofac Res* 2017;20:127-33.
12. Andriekute A, Vasiliauskas A, Sidlauskas A. A survey of protocols and trends in orthodontic retention. *Prog Orthod* 2017;18:31.
 13. Littlewood SJ, Kandasamy S, Huang G, Retention and relapse in clinical practice. *Aust Dent J* 2017;62 Suppl 1:51-7.
 14. Littlewood SJ, Millett DT, Doubleday B, Bearn DR, Worthington HV. Orthodontic retention: a systematic review. *J Orthod* 2006;33:205-12.
 15. Singh P, Grammati S, Kirschen R. Orthodontic retention patterns in the United Kingdom. *J Orthod* 2009;36:115-21.
 16. Zachrisson BU. Long-term experience with direct-bonded retainers: update and clinical advice. *J Clin Orthod* 2007;41:728-37; quiz 749.