

EXPLORING RETENTION REALITIES: A SURVEY ON CURRENT ORTHODONTIC RETENTION PROTOCOLS

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ABSTRACT

Background And Aim: Retention is the final stage of an orthodontic therapy to maintain tooth positions achieved after active treatment which should be planned from the very beginning. This study aims to collect information on how orthodontists plan and manage the retention phase after orthodontic treatment and what orthodontists do in their everyday practice, including how they place retainers, how long they keep patients in retention, and how often they schedule follow-up visits.

Methods: An online survey was made using google forms consisting of 35 questionnaire was sent to orthodontists in Andhra Pradesh. 29 out of 35 questions were multiple choice and 6 open questions that required written answers. The data was categorical; Pearson's chi-square test was applied for data analysis. P-value < 0.05 was considered statistically significant.

Result: In total, 80 participants completed the survey with the majority of respondents were with <5 yrs (83.8%) of clinical experience. 52.5% of clinicians report that fewer than 10% of their patients experience relapse, though 35% see relapse in 10–25% of their patient base. Spacing is the most frequently observed type of relapse (68.75%), followed by lower anterior crowding (32.5%)

Conclusion: The most common being fixed retainer in the mandible and dual retention, fixed, and thermoplastic retainer in the maxilla. The choice of retainer selection depends on multiple factors.

KEYWORDS: Retention, Fixed retainer, Thermoplastic retainers

INTRODUCTION

After orthodontic treatment, teeth have a tendency to relapse to their previous positions. Retention is an important stage of an orthodontic therapy to maintain tooth positions achieved after active treatment. Proper and well-planned retention procedures are important to reduce post-treatment changes and ensure long-term stability. Various retention appliances, generally grouped as fixed or removable retainers, are used in clinical practice. Hawley retainers, thermoplastic (vacuum-formed) retainers, fixed retainers etc. are common choices. The appliance and regimen selected are based on the type of tooth movement, the age and preferences of the patient, the health of the periodontium, and the clinician's decision.¹ Surveys have shown much variability in retention practices with removable retainers commonly used in the maxilla and fixed retainers in the mandible.²

There are more options for retainers now due to advancements in materials, digital orthodontics, and 3D printing. These options include bonded lingual retainers, clear thermoplastic aligners, and hybrid designs allowing clinicians to customize retention to each patient's unique needs.²

Despite these advancements, there is still no data to support specific techniques and there is no perfect retainer or retention protocol. Evaluating current retention practices and understanding clinicians rationale is therefore essential for guiding standardized, evidence-based protocols to ensure long-term orthodontic stability.

The purpose of this study was to identify the types of retainers most commonly used by orthodontists and to investigate differences in their retention protocols. In addition, the study aimed to assess orthodontists knowledge on retainer materials and to evaluate the rationale behind the choice of retention appliances in their daily practice.

METHODOLOGY

An online survey was made using google forms consisting of 35 questionnaire was sent to orthodontists in Andhra Pradesh. 29 out of 35 questions were multiple choice and 6 open questions that required written answers. The questionnaire was organized into five sections representing specific information about socio-demographic status of the respondents, selection of a retention system, details of commonly used fixed and removable retainers, the duration of the retention period, causes of relapse.

1	Socio-demographic status of the respondents	• Years of clinical experience in orthodontics • Type of practice • Geographic region/location of practice • Average number of orthodontic patients treated per year
2	Selection of a retention system	• Do you believe complete stability is achievable without permanent retention? • Do you explain the retention protocol prior to orthodontic treatment? • Do you use a standardized retention protocol for all patients? • Who decides the retention duration? • What type of retainers do you most commonly prescribe? • Which factors most influence your choice of retainer? • Do you think lifelong retention should be recommended?
3	Details of commonly used fixed and removable retainers	• For which arches do you use fixed retainers? • What material do you use for fixed retainers? • Bonding pattern for fixed retainers • Which type of composite do you use for bonding? • Which type of Essix retainer is used? • What material is used for the Essix retainer? • What thickness of Essix material is used? • Typical wear schedule for removable retainers • Do you provide written retention instructions to patients?
4	Duration of the retention period	• When do you usually place retainers after debonding? • Typical duration of the retention phase • Have you ever recalled patients for appointments after providing retainers?
5	Causes of relapse	• Approximate percentage of patients showing post-treatment relapse • Most common type of relapse in your experience • How often do you observe retainer failures?

Table 1: Questionnaire

STATISTICAL ANALYSIS:

The data was entered in Microsoft excel 2016. All statistical analysis was performed by using version 25.0 of the Statistical Package for Social Sciences (IBM Corporation, Armonk, New York, USA). The mean age in different groups were calculated. The data was categorical, Pearson's chi-square test was applied for data analysis. P-value < 0.05 was considered statistically significant.

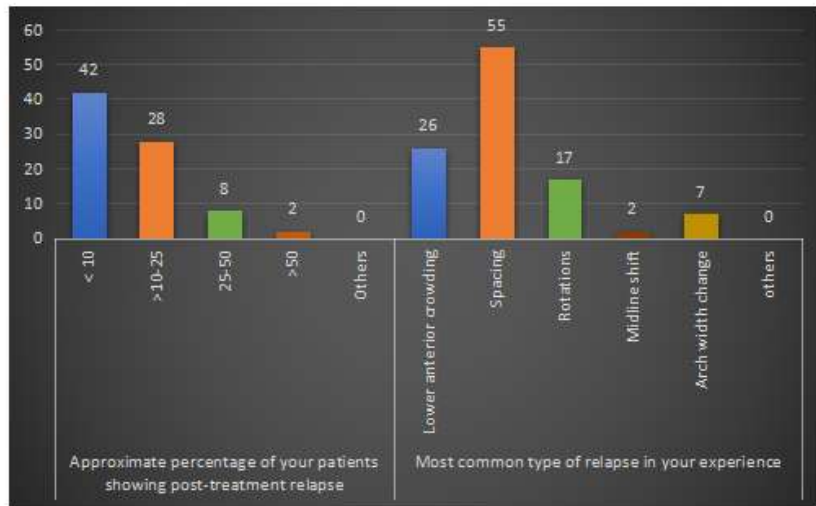
RESULTS:

In total, 80 participants completed the survey with the majority of respondents were with <5 yrs (83.8%) of clinical experience. It was found that 75% of respondents believe complete stability is unattainable without permanent retention. The results showed that orthodontists use the combination of removable and fixed retainers in either of the arches with dominant recommendation for removable retainers is full-time wear for 6 months followed by night-time wear (71.25%). Fixed retainers were placed in both the arches by 67.5% orthodontists from canine to canine using multistranded stainless steel wire and bonded with combination of flowable and packable composite

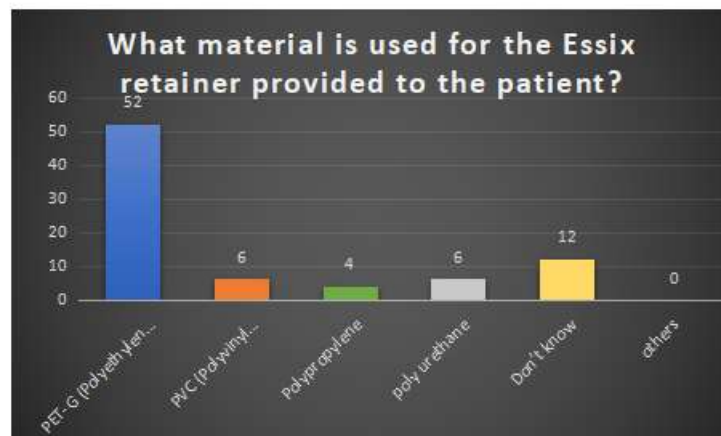
52.5% of clinicians report that fewer than 10% of their patients experience relapse, though 35% see relapse in 10–25% of their patient base. Spacing is the most frequently observed type of relapse (68.75%), followed by lower anterior crowding (32.5%). (Graph 1)

Most of the orthodontists favor Hard Essix (72.5%) with a thickness of 1.0mm (60%), primarily using PET-G material (65%) (Graph2). Clinicians identify discomfort (75%) and esthetics (56.25%) as the primary reasons patients fail to follow protocols

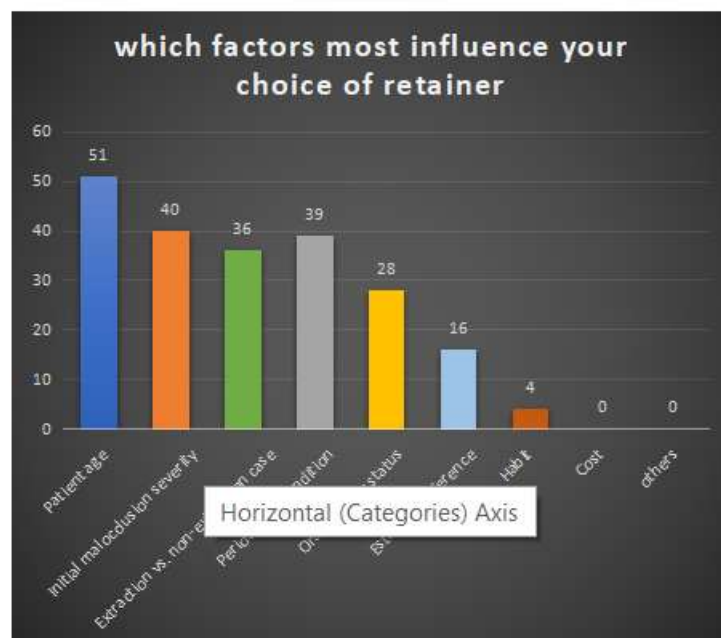
62.5% of clinicians have performed procedures like frenectomies or pericision to aid in stability. 55% of practitioners are satisfied with their current retention outcomes, with 13.75% being very satisfied.



Graph 1: Percentage and causes of relapse



Graph 2: Materials used for thermoformed retainers



Graph 3: Factors influencing the choice of retainer

DISCUSSION

This survey showed that most of the orthodontist use combination of removable and fixed retainers in both the arches with maximum of removable retainers in the maxillary arch and fixed retainer in mandibular arch which is similar finding to those of previous studies^{4,1}

Most of the orthodontists preferred retainers to be fixed to all six anterior teeth using multistranded stainless steel wire, and this way of fixation was dominant in combination of upper and lower arches. In that aspect, our results were in line with a study conducted by Keim et al⁵

When choosing a fixed retainer for the upper arch, it is reasonable to recommend a canine-to-canine retainer if the occlusion allows. If there are interfering occlusal contacts on the canines, an incisor-to-incisor retainer may be more appropriate. In the mandible, the gold standard is to bond the fixed retainers from canine to canine, and keep premolar-to-premolar retainers only for selected cases due to the increased risk of failure.³

Removable retainers were recommended to wear for full time till 6 months followed by only night time wear. Valiathan et al suggested full-time wear should last between three to nine months, which is in line with our findings.⁶ The advantages of removable retainers are clear; they do not interfere with daily activities and become a habit, increasing the likelihood of patient compliance. Patients are also less likely to lose them.

Reitan's research showed that after eight months, the periodontal fibers in the coronal third of the roots and the gingival fibers are only partially rearranged. This might explain why most clinicians recommend full-time wear for three to nine months.^{7,8}

Hard Thermoformed retainers were most commonly used with the thickness of 1.0 mm made of PET G which was similar to the study⁹ but in contrary, the material used in that study was ethyl vinyl acetate or EVA as a receptacle for dental bleaching gel. 82.5% of orthodontist following debonding, retainer was delivered on the same day by majority of orthodontists with remaining orthodontists delivering retainer with next 2 days similar to a study by Bamal et al¹⁰. Around 56.2% of them had found the retainer failure occasionally with spacings followed by lower anterior crowding being the most common type of relapse.

Factors influencing the choice of retainer included patient age, initial malocclusion severity, extraction or non-extraction case, periodontal condition of the patient, oral hygiene status and esthetics. In a study by Singh et al¹¹ it was found that age has negligible influence on retainer choice which is in contradiction to the present study.

The study highlights that performing adjunctive procedures like frenectomies can aid in stability which was similar to other studies.^{4,12,13} In a study by Jewair et al¹⁴, Pratt et al¹⁵ it was claimed that IPR is the most common type of adjunctive procedure to aid in stability which was in contrary to the present study.

CONCLUSION

- Removable and fixed retainers in both the arches with maximum of removable retainers in the maxillary arch and fixed retainer in mandibular arch
- Removable retainers were recommended to wear for full time till 6 months followed by only night time wear.
- Hard Thermoformed retainers were most commonly used with the thickness of 1.0 mm made of PET G
- The patient age, initial malocclusion severity, extraction or non-extraction case, periodontal condition of the patient, oral hygiene status and esthetics were the most influencing factors for the choice of retainers.

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