

Knowledge and Attitude about Clear Aligners and Fixed Orthodontic Therapy Among Dentist in Chennai

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Abstract

Background: Orthodontic treatment aims to improve the smile, facial appearance; obtain optimal occlusion; and establish normal oral function. Today, there are myriad of appliances available for orthodontic therapy and there continue to be innovations in this field. Ideally, appliance design is based on effectiveness to meet goals for changing jaw and/or tooth positions. Other factors include patient compliance, craniofacial anatomy, as well as the skills and experience of the operator. Ideal appliance selection is dependent on a correct diagnosis of the orthodontic problems, which will in turn lead to ideal outcomes. The aim of this study is to assess the knowledge of dentist in Chennai on clear aligners and fixed orthodontic therapy through a questionnaire. The objective of the study is to identify areas of strength and weakness of Clear aligners and fixed orthodontic therapy among the dentist. **Materials and Methods:** An online cross-sectional study was conducted among 200 dentist practicing in and around Chennai using a Google Forms questionnaire. Statistical analysis was done for the collected data. **Results:** Results concluded that the knowledge and awareness about the clear aligners were much less among the general practitioners and other specialty dentist compared with orthodontist which was statistically significant ($P < 0.01$). **Conclusion:** The overall awareness and attitude of the dentist on clear aligners and fixed orthodontic therapy who are practicing in and around Chennai showed that there is increasing need for clinical oriented education of practice and concepts of orthodontic treatment.

Keywords: Attitude, Clear aligners, Dentist, Fixed orthodontic therapy, Knowledge, Practice.

INTRODUCTION

Orthodontics is considered the oldest specialty of dentistry. Evidence suggest that attempts were taken to treat malocclusion before 1000 before christ (BC). Primitive appliances to move teeth have been found in Greek and Etruscan excavations. The first recorded suggestion for active treatment of malocclusion was given by Aulis Cornelius Celsus (25 B.C–50 Anno Domini [A.D]) who advocated the use of finger pressure to align the teeth. Pierre Fauchard a French dentist is considered the father of modern dentistry.^[1] He developed the first orthodontic appliance called the Bandelette that was designed to expand the arch.^[2] Ideal appliance selection is dependent on a correct diagnosis of the orthodontic problems which will in turn lead to ideal outcomes with better prognosis. The development of Invisalign by Align technology Inc., in 1997 has become a major treatment modality that orthodontist and general practitioners are now familiar with a decade after its development. Because of the educational background of orthodontist, general practitioners, and other specialist in dentistry, it would be interesting to see how their experiences with orthodontic therapy differs. Several studies have been

conducted to determine whether general practitioner have enough training to provide comprehensive orthodontic treatment. The main purpose of this study is to test the knowledge and awareness about the use of Invisalign and fixed appliances between orthodontist and general practitioner in and around Chennai.

MATERIALS AND METHODS

The study was performed using a questionnaire survey consisting of 30 questions which was approved by Institute Ethical Committee (IEC/TDCH/143/2021) that was sent to 200 dentists through Google forms who were practicing in and around Chennai. The questionnaire was designed to assess the

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dentist knowledge and awareness about the fixed orthodontic therapy and clear aligners. Responses to questions consisted of multiple-choice answers. Results were obtained as data charts from Google Forms which were used to conduct the survey.

The first five questions were about the demographic data of the participating dentists such as age, gender, area, year of experience, and their specialty. The second set of 5 questions was based on their view about the selection of orthodontic appliances in their clinics. The third set of questions was regarding their preference of orthodontic appliances and treatment modalities based on esthetics, oral hygiene for specific malocclusion, and their choice of treatment options for specific malocclusion.

The next set of questions was to determine their knowledge about the fixed and clear aligner therapy including their outcomes and adverse effects.

The last two questions were perused to know about their view on incorporating additional syllabus on dental school curriculum and training skills in fixed orthodontic therapy and clear aligners.

Inclusion criteria

Dental health providers (MDS, BDS with clinical experience practicing either in rural or urban areas).

Exclusion criteria

Dentist who did not consent to be the part of study were excluded from the study.

Ethical approval and official permission

This study protocol was reviewed by the ethical committee of Tagore Dental College and Hospital and was granted ethical clearance.

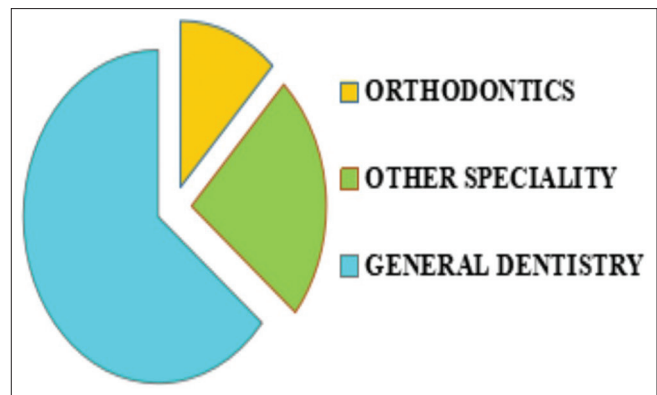
Statistical analysis

Data were analyzed using SPSSV20 (the Statistical Package for the Social Sciences Software) and descriptive variables were tabulated. Chi-square test was used to test the difference between groups based on specialty of practice. Due to the uneven distribution of the study participants, the percentage distribution of individual questions was done to understand the dentist's choice for orthodontic therapy.

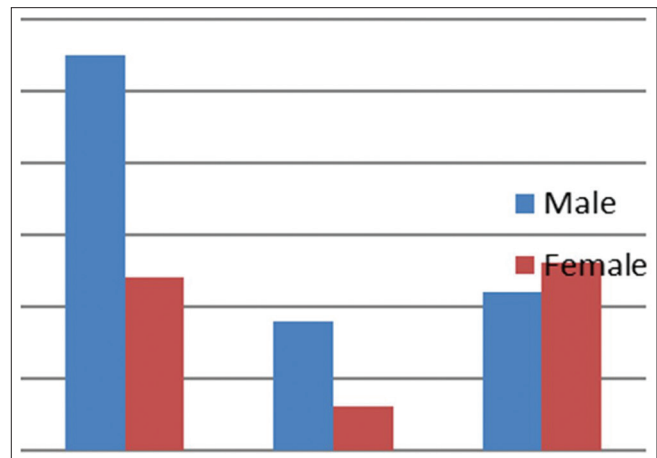
RESULTS

The study was done on closed structured questionnaires with 200 participants of General dentists, Orthodontist, and Other specialist who are practicing in and around Chennai (Graph 1). The majority of the participants worked as a general practitioner.

Of the study population, 52.3% were female and 47.7% were male covering most of them from urban population (81.2%) (Graph 2). When all the participants were questioned about the type of appliance preferred, the maximum positive response for clear aligners was given by orthodontist (41.7%) followed by general dentist (35.2%). Ceramic bracket was the highest choice of appliance preferred by other speciality dentists.



Graph 1: Distribution of study population



Graph 2: Data showing no of male/female participants

Almost 58.3% of practitioners felt that clear aligners are best for oral hygiene maintenance and over 54% were aware that regular orthodontic appliance might cause more periodontal problem but might yield a better occlusal contact (72%) than clear aligner. Chi-square test was applied and results were found to be highly statistically significant with the $P < 0.05$.

Appliance-based questions were asked and it showed nearly 85.4% of participants in the survey supported Clear Aligners. Supporting the statement our study results also showed that nearly 64.6% of the dentist supported that they would treat 20–30% of patients with clear aligners. 67.7% participants supported rotation as the most difficult movement to achieve. Root resorption (62.5%) and periodontal problems are more frequent in patients with regular orthodontic therapy. 81.2% of the dentist felt that intraoral molar distalization appliance was more effective for molar distalization than clear aligners or headgears. According to the survey, the duration of the treatment is decreased in cases of clear aligners as compared to fixed orthodontic therapy. Over 77.1% know that clear aligners provide better oral hygiene and better esthetics as compared to other orthodontic appliance therapy. Therefore, the overall well-being of the patient is less affected during clear aligner therapy compared to fixed orthodontic therapy.

Since general practitioners graduate from the dental school with limited training in orthodontic diagnosis and treatment planning, most of the general dentist who participated in the survey felt that education they obtained during their under graduation and training in both fixed and clear aligner orthodontic therapy did not provide them sufficient knowledge and skill to treat their patients after course in their clinics.

DISCUSSION

Malocclusion is a common oral disorder which can cause negative impact on oral conditions, social life, and patients' self-confidence. Orthodontic treatment comprises a large proportion of affected individuals. With the emerging technology in the medical field, a thorough knowledge of application and outcome of the latest technology becomes mandatory for every dentist. Thus, our study was conducted to evaluate the knowledge and attitude of dentist in clear aligners and fixed orthodontic therapy.

In the present cross-sectional study, over 62.5% preferred metallic brackets as they are reliable and versatile in producing lot of orthodontic movements and also cost effective compared to other orthodontic therapy. The shear strength of the metal brackets might be low as compared to the ceramic brackets which was given by Reddy *et al.*^[3] A total of nearly 127 participants out of 200 (63.5%) dentists supported the clear aligners when questioned about their preference of therapy based on esthetic concern for their patients. This might be due to metal brackets being less esthetic when compared to clear aligners. Increasing demand of adult orthodontic patients also added favor to general desire for clear aligners among dentist. Other major determining factors are patient's own esthetic concerns which also play a major role in determining their choice of treatment. This usually depends on the socioeconomic status, awareness of problems associated with malocclusion, and their mental attitude toward orthodontic therapy.^[4]

When dentists were questioned on the variation of subgingival microbiotas during different orthodontic therapy and their view on the most probable therapy that would less impact to the oral hygiene status of the patient, the results were favorable with clear aligners. The periodontal risk is lower in clear aligners as compared to that of fixed orthodontics appliance due to the fact that aligners are removable while fixed appliances are very difficult to clean. Coming to the variation of subgingival microbiota, total bacterial count was low in cases of clear aligners which was also confirmed by a study by Miethke and Vogt.^[5] Studies by Lambardo *et al.*^[6] stated that red-complex bacteria *Aggregatibacter actinomycetemcomitans*, *Porphyromonas Gingivals*, *Fusobacterium nucleation*, *Campylobacter rectus*, *Treponema Sentido la*, and *Taneerla forysthesia* were progressively increased in fixed appliance whereas it remains constant in clear aligner group which was similar to the results found in our study. Thus, the type of orthodontic treatment might cause variation in subgingival microbiota. Removable appliances showed decreased plaque

accumulation and less susceptibility to gingival inflammation, caries, decalcification, or white spot lesions.^[5,7,8]

All the participants of the survey supported FA to produce better occlusal contact as they were able to make precise wire adjustments within 0.5 mm to intrude or extrude teeth as necessary while its difficult for aligners to extrude a tooth as aligners covers the occlusal surface of teeth, prevent settling of the occlusion. Ke *et al.*,^[9] suggested that clear aligners had advantage in segmented movement of teeth but were not as effective as fixed orthodontic therapy to produce adequate occlusal contacts controlling teeth, torque, and retention. Djeu^[10] blamed the statistically significant low score of clear aligners on poor control of root torque. However, clear aligners according to Zheng *et al.*^[11] showed decreased chair side time and also help in segmented tooth movement.

Knowledge and awareness of dentist about various appliances that they prefer during orthodontic therapy for patients showed that for impacted maxillary cuspid and other teeth, fixed orthodontic treatment (67%) is typically the ideal option for treatment. As stated by Singh *et al.*,^[12] any appliance should have the capability to level and rotate all the teeth with controlled crown and root movement and also to open adequate space to accommodate the impacted teeth.

In our study, our participants felt fixed orthodontic therapy as a major cause for root resorption which may compromise the continued existence and functional capacity of the affected tooth, depending on its magnitude. Cheng *et al.*^[13] in his study has stated that the resorption continued for 4 weeks after the cessation of orthodontic force.

Patients might have several complaints during the orthodontic treatment which includes problems in cleansing teeth, pain, discomfort, and difficulty in speech and eating. The overall well-being of the patient would be less affected by clear aligners because of the esthetics and ease of oral hygiene maintenance. However, cost determines to be the major drawback for patient choosing clear aligner.

The past two questions were perused to know about their view in incorporating additional knowledge and training in their dental school curculus. Almost nearly most of the participants have opinion that the education they obtained need much of clinical oriented practice to upgrade their knowledge in orthodontic treatments.^[14] 160 participants of about 82% of general dentist stated that the education obtained during their curriculum was not sufficient for private practice and they need more amount of clinically oriented knowledge to improve the quality of patients during practice.

CONCLUSION

From the study conducted, the existing condition and scenario of the level of knowledge and attitude of the general dentist about the concepts in orthodontic treatment can be ascertained. From this study, we can conclude that the undergraduate syllabus should emphasize more on the therapeutic concepts

containing more clinical orientation programs which can be helpful for the undergraduates to obtain more insight in the latest innovations and developments in the orthodontic field.

CONFLICT OF INTEREST

Authors declare no potential conflict of interest.

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