Knowledge, Attitude And Perception Of Orthodontic Treatment Among Dental Students: A Cross-Sectional Questionnaire Study

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Abstract

Background*: Orthodontic treatment plays a crucial role in improving dental esthetics, oral function, and psychosocial well-being. Dental students, as future oral healthcare providers, are expected to possess adequate knowledge and a positive attitude toward orthodontic treatment modalities. Their perception significantly influences patient motivation, referral decisions, and treatment acceptance.*

Aim: *To assess the knowledge, attitude, and perception regarding orthodontic treatment modalities among dental students at Adhiparasakthi Dental College and Hospital*

Materials and Methodology: *A cross-sectional questionnaire-based study was conducted among 253 dental students, including undergraduate students, Compulsory Rotatory Residential Interns (CRRI), and postgraduate students. A structured questionnaire assessing knowledge, attitude, and perception toward orthodontic treatment was distributed. Data were analyzed using descriptive statistics and Chi-square tests to determine associations between academic level and responses. A p-value < 0.05 was considered statistically significant.*

Results: *Awareness of orthodontic treatment was high among participants. Clear aligners were perceived as the most aesthetic and acceptable appliance. A statistically significant association was observed between the year of study and preferred orthodontic treatment modality. Most students believed orthodontic treatment improves self-confidence and facial appearance.*

Conclusion*: Dental students demonstrated good knowledge and a positive attitude toward orthodontic treatment. Academic level influenced treatment preferences, with increased acceptance of modern orthodontic modalities such as clear aligners among senior students.*

Keywords: *Orthodontics, Knowledge, Attitude, Perception, Dental Students, Cross-sectional Study, Clear Aligners*

I.   Introduction

Malocclusion is one of the most common developmental conditions affecting the craniofacial region and is widely recognized as a significant oral health concern. Although it is not a disease in itself, malocclusion can negatively influence oral function, facial balance, speech, periodontal health, and temporomandibular joint harmony. Beyond the functional dimension, irregular dental alignment often has a noticeable impact on facial appearance, which plays a major role in social interaction and self-perception. In contemporary society, where facial esthetics is closely linked with confidence and social acceptance, the demand for orthodontic treatment has increased considerably.

Orthodontic therapy aims not only to align teeth but also to establish functional occlusion and improve dentofacial harmony. Traditional fixed appliances, such as metal braces, have long been the standard method of correction. However, advances in biomaterials, digital imaging, and computer-aided treatment planning have transformed modern orthodontics. Contemporary modalities, including ceramic brackets, lingual appliances, and clear aligner systems, offer improved esthetics and comfort. These developments have expanded treatment acceptance among adolescents and adults who might otherwise hesitate to undergo therapy due to visibility or lifestyle concerns. The perception of orthodontic treatment has shifted over time from being viewed as a purely corrective dental procedure to an intervention that can positively influence psychological well-being and quality of life. Studies have shown that individuals with well aligned teeth are often perceived as more confident, socially approachable, and professionally competent. As a result, orthodontic treatment is increasingly considered an investment in both health and personal image.

Dental students occupy a unique position in the healthcare system as future dental practitioners and educators. Their knowledge and beliefs regarding orthodontic care directly influence how they counsel patients,

identify treatment needs, and make referrals to specialists. Inadequate understanding or misconceptions at the undergraduate level may lead to under-referral, delayed treatment, or biased information given to patients. Conversely, well-informed students are more likely to appreciate the importance of early intervention, interdisciplinary collaboration, and individualized treatment planning.

Academic exposure to orthodontics typically begins with theoretical instruction during preclinical years and progresses to clinical observation and patient management in later stages of training. This gradual increase in exposure can shape attitudes and preferences toward various treatment modalities. Junior students may rely largely on textbook knowledge, whereas senior students develop opinions influenced by clinical encounters, patient compliance challenges, and real-world treatment outcomes. The growing popularity of aesthetic orthodontic options, heavily promoted through digital media and patient demand, may further influence students' perceptions.

Understanding how dental students perceive orthodontic treatment is important for multiple reasons. It provides insight into the effectiveness of current educational strategies, highlights areas where misconceptions may exist, and helps educators tailor curriculum content to address evolving trends in orthodontics. Moreover, assessing attitudes toward newer technologies such as clear aligners can indicate how prepared future dentists are to discuss and guide patients regarding contemporary treatment choices.

II. Objectives

Primary Objective: To assess the knowledge, attitude, and perception toward orthodontic treatment among dental students.

Secondary Objectives
To compare responses across different academic levels
To evaluate preferences for various orthodontic treatment modalities
To analyze perception toward newer orthodontic technologies such as clear aligners

III. Materials And Methods

Study Design:A cross-sectional questionnaire-based observational study.
Study Setting:The study was conducted at Adhiparasakthi Dental College and Hospital.
Study Population:
Dental students including:
Undergraduate students (1st year to final year)
Compulsory Rotatory Residential Interns (CRRI)
Postgraduate students
Size:
A total of 253 students participated in the study.
Sampling Method: Convenience sampling was used to recruit participants who were present during the period of data collection. The study protocol was reviewed and approved by the Institutional Ethical Committee of Adhiparasakthi Dental College and Hospital.
Informed consent was obtained from all participants.
Inclusion Criteria:
Dental students willing to participate
Students present at the time of questionnaire distribution
Exclusion Criteria
Incomplete questionnaire responses
Students unwilling to participate
Data Collection Tool
A structured, pre-validated questionnaire was used. It consisted of three sections: Knowledge Questions regarding awareness of orthodontic treatment, benefits, and treatment duration.
Attitude: Questions assessing willingness to undergo treatment, recommend treatment, and perceived importance of orthodontics.
Perception: Questions evaluating opinions on aesthetic appliances, treatment comfort, and psychosocial impact.

Procedure: The questionnaire was distributed in printed format. Participants were briefed about the purpose of the study, and informed consent was obtained. Confidentiality was maintained.

Statistical Methodology
Data were entered in Microsoft Excel and analyzed Descriptive statistics were used to summarize the data, with categorical variables presented as frequencies and percentages. Associations between categorical

variables, including year of study and responses related to knowledge, attitude, and perception of orthodontic treatment, were assessed using the Chi-square test of association, while the Chi-square goodness-of-fit test was applied where appropriate. A p-value < 0.05 was considered statistically significant. As the study was primarily descriptive and exploratory, no multivariable analysis or adjustment for confounding variables was performed.

Subgroup analysis was conducted based on year of study (CRRI, I–IVyear undergraduate students, and postgraduate students) using contingency tables. Missing or incomplete responses were excluded from the respective analyses using an available-case approach. The study followed a cross-sectional questionnaire-based design with convenience sampling; therefore, no weighting or complex sampling adjustments were applied, and the findings are interpreted considering the limitations of the sampling strategy.

IV. Results

A total of 253 dental students completed the questionnaire and were included in the analysis. As this was a cross-sectional survey, there was no follow-up period. Participants represented different stages of training: 198 (78.3%) were undergraduate students (I–IV year), 46 (18.2%) were CRRI students, and 9 (3.6%) were postgraduate students. All available responses were analysed for each variable; items with missing responses were excluded only from the specific analysis in which they occurred. The proportion of missing data was minimal and did not materially affect the sample size for individual analyses (N reported for each test ranged up to 253).

Awareness of orthodontic treatment was high across the study population. Across most perception questions, clear aligners and metal or ceramic braces accounted for the majority of responses, whereas lingual options were selected infrequently. Overall response patterns suggested broadly similar knowledge and beliefs across years of study, with some differences in specific preferences. **Associations with year of study**

There was no statistically significant association between year of study and awareness of orthodontic treatment ($\chi^2 = 0.245$, p = 0.885), indicating uniformly high awareness among undergraduates, CRRI, and postgraduate students. A statistically significant association was observed between year of study and preferred orthodontic treatment modality ($\chi^2 = 18.3$, df = 6, p = 0.005). Metal braces were the most commonly preferred modality overall, followed by ceramic braces and clear aligners, but the distribution of these preferences differed by academic level.

Year of study was also significantly associated with the most acceptable orthodontic appliance ($\chi^2 = 10.6$, df = 4, p = 0.031). Clear aligners were the most commonly accepted option in all groups, although the proportion selecting them varied by year.
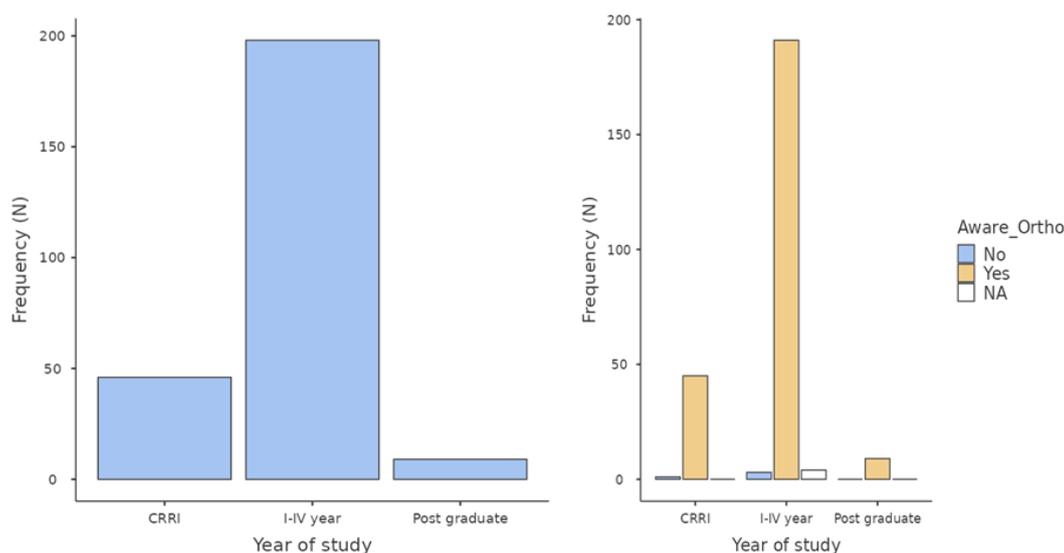
In contrast, perception of the most aesthetic appliance did not differ by year of study ($\chi^2 = 3.42$, df = 6, p = 0.755). Across all academic levels, clear aligners were most frequently perceived as the most aesthetic option.

A significant association was found between year of study and the appliance students were most likely to recommend to patients ($\chi^2 = 16.0$, df = 6, p = 0.013).

Clear aligners were the most frequently recommended modality overall, but recommendation patterns varied with academic seniority.

No significant association was observed between year of study and the appliance perceived to be associated with high patient compliance ($\chi^2 = 9.59$, df = 6, p = 0.143) or the appliance perceived to most strongly

influence patients to seek treatment (χ^2 = 5.35, df = 6, p = 0.500). In both cases, clear aligners were the most commonly selected option across all years.

Beliefs about the broader psychosocial impact of orthodontic treatment were consistent across training levels. There was no significant association between year of study and the belief that orthodontic treatment improves patient confidence (χ^2 = 0.560, df = 2, p = 0.756), with the vast majority of participants in every group responding "yes".

Similarly, views on the future of orthodontics did not differ significantly by year of study. Most students believed that newer orthodontic modalities may replace conventional appliances, but this belief was not associated with academic level (χ^2 = 1.73, df = 2, p = 0.420). Perception of the single "best" orthodontic treatment modality also showed no significant variation across years (χ^2 = 7.74, df = 6, p = 0.258), although clear aligners were most frequently chosen overall.

There was no statistically significant association between year of study and perceived factors influencing patient choice of orthodontic treatment (χ^2 = 12.3, df = 8, p = 0.138). Age, fear of discomfort, and financial considerations were the most commonly selected factors in all groups.

Finally, perceived orthodontic modality associated with the best patient satisfaction did not differ by year of study (χ^2 = 3.01, df = 4, p = 0.557). Metal braces were most frequently selected overall, followed by clear aligners. The findings indicate that core knowledge and general beliefs about orthodontic treatment are similar across different stages of dental training. However, specific preferences and clinical recommendations vary significantly with year of study. Clear aligners were consistently viewed as the most acceptable, aesthetic, and recommendable option, whereas metal braces remained a common preference for overall treatment and perceived patient satisfaction. This pattern suggests increasing influence of evolving orthodontic technologies on student

attitudes while fundamental awareness and perceived benefits of orthodontic treatment remain stable throughout training.

A majority of students believed orthodontic treatment:
Improves self-confidence
Enhances facial appearance
Positively impacts social interactions

No significant differences were observed across academic levels in these perceptions.

Contingency Table: Most Aesthetic Orthodontic Appliance

Year of Study	Ceramic Braces	Clear Aligners	Lingual Aligners	Metal Braces	Total
CRRI	7	25	0	14	46
I–IV Year	24	105	2	67	198
Post Graduate	0	7	0	2	9
Total	31	137	2	83	253

Contingency Table: Most Acceptable Orthodontic Appliance

Year of Study	Ceramic Braces	Clear Aligners	Metal Braces	Total
CRRI	3	27	16	46
I–IV Year	24	96	78	198
Post Graduate	0	9	0	9
Total	27	132	94	253

Contingency Table: Preferred Treatment Modalities

Year of Study	Ceramic Braces	Clear Aligners	Lingual Braces	Metal Braces	Total
CRRI	10	13	0	23	46
I–IV Year	81	29	1	87	198
Post Graduate	0	5	0	4	9
Total	91	47	1	114	253

Contingency Table: Likely to Recommend Orthodontic Appliance

Year of Study	Ceramic Braces	Clear Aligners	Lingual Aligners	Metal Braces	Total
CRRI	3	22	0	21	46
I–IV Year	24	103	1	70	198
Post Graduate	0	5	1	3	9
Total	27	130	2	94	253

S.no	Variable assessed	χ² value	p-value
1	Awareness of orthodontic treatment	0.245	0.885
2	Preferred orthodontic treatment modality	18.3	**0.005***
3	Most acceptable orthodontic appliance	10.6	**0.031***
4	Most aesthetic orthodontic appliance	3.42	0.755
5	Appliance most likely to be recommended	16.0	**0.013***
6	Appliance associated with high patient compliance	9.59	0.143
7	Appliance perceived to influence patients most	5.35	0.500
8	Orthodontic treatment improves patient confidence	0.560	0.756
9	Newer modalities will replace conventional appliances	1.73	0.420
10	Best orthodontic treatment modality	7.74	0.258
11	Factors influencing patient choice	12.3	0.138
12	Orthodontic modality with best patient satisfaction	3.01	0.557

Table 1: Association between year of study and knowledge, attitude, and perception variables related to orthodontic treatment among dental students. (* *denotes statistically significant*)

V. Discussion

The present study evaluated knowledge, attitude, and perception regarding orthodontic treatment among dental students at different stages of training. Overall, the findings indicate that students possess a good foundational understanding of orthodontic therapy and hold favorable attitudes toward its functional and psychosocial benefits. These observations are encouraging, as dental students represent future oral health professionals whose perspectives will influence patient education and referral patterns.

Awareness of orthodontic treatment was consistently high across all academic levels, suggesting that theoretical instruction regarding malocclusion and its management is effectively introduced early in the dental curriculum. This uniformity indicates that even junior students are familiar with the purpose and benefits of orthodontic care. However, while general knowledge remained similar, specific preferences for orthodontic appliances varied significantly with academic level. This pattern supports the idea that clinical exposure plays a crucial role in shaping treatment perceptions beyond theoretical knowledge alone.

One of the most notable findings was the strong preference for clear aligners as the most aesthetic and acceptable appliance. This reflects a broader global trend in which patients and practitioners increasingly favor less visible treatment options. Clear aligners are often associated with improved comfort, removability during meals and oral hygiene procedures, and minimal interference with daily activities. Dental students, who are themselves part of a socially active age group, may be particularly sensitive to the esthetic advantages of such appliances. Exposure to digital orthodontic workflows and modern treatment planning systems during clinical training may further strengthen this perception.

Despite the growing popularity of aligner therapy, conventional metal braces remained a commonly preferred option for overall treatment and perceived patient satisfaction. This may indicate that students recognize the reliability and versatility of fixed appliances, particularly in complex malocclusion cases. Clinical teaching often emphasizes that aligners may not be suitable for every patient, and such academic discussions likely influence students' balanced perspectives. Therefore, while aesthetic appeal drives acceptance of newer modalities, confidence in traditional appliances persists due to their proven effectiveness.

The influence of academic level on treatment recommendation patterns highlights the importance of experiential learning. Senior students, who have greater exposure to patient management, may better appreciate factors such as compliance, treatment duration, cost considerations, and case selection criteria. Their recommendations are therefore likely shaped by a more comprehensive understanding of real-world orthodontic practice. In contrast, junior students may base their preferences more on perceived esthetics or theoretical advantages .

Another important aspect revealed in this study is the strong belief in the psychosocial benefits of orthodontic treatment. Most students agreed that correcting malocclusion can improve self-confidence, facial appearance, and social interactions. This awareness is crucial because modern dentistry increasingly recognizes the relationship between oral health and overall quality of life. Dental practitioners who understand these psychological dimensions are better equipped to motivate patients and provide empathetic counseling. Interestingly, perceptions regarding patient compliance and motivation did not differ significantly across academic levels. This suggests that students share similar assumptions about how different appliances influence

patient behavior. It may also reflect the need for deeper clinical discussion regarding behavioral factors that affect treatment success. Incorporating case-based learning and patient communication training into the curriculum could help students develop more nuanced insights into these aspects.

The findings of this study also underline the influence of evolving orthodontic technology on student attitudes. With increased exposure to digital scanning, 3D treatment simulations, and aligner systems, dental education is gradually adapting to technological advancements. As students become more familiar with these innovations, their acceptance and confidence in recommending them naturally increase. However, it remains important to ensure that enthusiasm for new technologies is balanced with evidence-based understanding of indications and limitations.

From an educational perspective, these results highlight the effectiveness of current orthodontic teaching while also identifying areas for enhancement. Strengthening clinical exposure, interdisciplinary case discussions, and evidence-based evaluation of different treatment modalities can further improve students' decision-making abilities. Encouraging critical appraisal of emerging technologies will help future practitioners provide balanced and ethical treatment advice.

The limitations of the study, including its single-institution setting and smaller postgraduate sample, should be considered when interpreting the findings. Nevertheless, the results provide valuable insight into how dental students perceive orthodontic care during their training years. Future multicenter studies with larger and more diverse samples could provide a broader understanding of these trends and help refine educational strategies.

Overall, the study demonstrates that dental students have a sound appreciation of orthodontic treatment and its benefits. Variations in appliance preference across academic levels reflect the natural progression from theoretical learning to clinically informed judgment. As orthodontic technology continues to evolve, integrating comprehensive education with hands-on experience will be essential in preparing dental graduates to guide patients effectively in choosing appropriate treatment options.

VI.   Limitations

The number of postgraduate students included in the study was comparatively small, which may have influenced the stability of the association tests involving year of study. Therefore, the observed associations should be interpreted with caution, and future studies with a larger postgraduate sample are recommended.

VII.   Conclusion

The core knowledge and general beliefs about orthodontic treatment are similar across different stages of dental training. However, specific preferences and clinical recommendations vary significantly with year of study. Clear aligners were consistently viewed as the most acceptable, aesthetic, and recommendable option, whereas metal braces remained a common preference for overall treatment and perceived patient satisfaction.

This pattern suggests increasing influence of evolving orthodontic technologies on student attitudes while fundamental awareness and perceived benefits of orthodontic treatment remain stable throughout training.

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