

## Assessment of awareness for orthodontic treatment regard for fixed orthodontic mechanotherapy and aligners therapy in young adults in Tamil Nadu

### ABSTRACT:

#### Background:

Malocclusion and misaligned teeth can negatively affect oral health, facial aesthetics, and quality of life. Advances in orthodontics have introduced various treatment options, including conventional fixed orthodontic appliances and clear aligner systems. Awareness of these treatment modalities among young adults is essential, as it influences treatment preferences and utilization of orthodontic care.

#### Aim:

The present study aimed to evaluate the level of awareness and knowledge regarding fixed orthodontic mechanotherapy and clear aligner therapy among young adults in Tamil Nadu.

#### Materials and Methods:

A cross-sectional survey was conducted among young adults using a structured questionnaire designed to assess awareness, perception, and knowledge of orthodontic treatment options. The questionnaire included items related to familiarity with fixed appliances, understanding of aligner therapy, and reasons for considering orthodontic treatment. The responses obtained were compiled and analyzed using descriptive statistical methods.

#### Results:

The findings revealed that most participants were familiar with conventional fixed orthodontic treatment, whereas awareness of clear aligner therapy was comparatively lower. Aesthetic improvement emerged as a major motivating factor for seeking orthodontic care among the respondents. However, knowledge regarding the broader functional benefits of orthodontic treatment and newer treatment modalities varied among participants.

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## Conclusion:

Within the limitations of the study, it can be concluded that awareness of fixed orthodontic treatment is relatively higher among young adults, while knowledge of aligner-based therapy is still developing. Enhancing patient education and increasing public awareness through dental professionals and reliable information sources may help individuals better understand available orthodontic treatment options and make informed decisions regarding their oral health.

**Keywords:** Orthodontic awareness, fixed orthodontic mechanotherapy, clear aligners, young adults, dental aesthetics.

## INTRODUCTION:

Dentistry continues to evolve with ongoing technological advancements. The introduction of clear aligners represents a significant development in orthodontics. However, the concept of removable orthodontic appliances dates back several decades, and patient attitudes toward such appliances were documented as early as 1973.<sup>1</sup>

Fixed mechanotherapy consists of brackets, arch wires, and bands bonded to the teeth to achieve proper alignment. This technique has been widely used for decades and remains effective in managing complex malocclusions.<sup>3</sup> However, it is often associated with discomfort, difficulty in maintaining oral hygiene, and aesthetic concerns.<sup>7</sup> Clear aligner therapy, in contrast, employs a series of removable transparent trays to gradually reposition teeth. Studies evaluating aligner therapy have demonstrated measurable tooth movement and clinical effectiveness.<sup>2,3</sup> This method is generally perceived as more comfortable and esthetically acceptable, contributing to its increasing popularity among adolescents and adults.<sup>4</sup>

With the growing demand for orthodontic treatment, esthetics has become a primary concern for many patients. Psychosocial factors and self-perception of dental appearance significantly influence the motivation to seek orthodontic treatment.<sup>9,10</sup> Clear aligners have emerged as an alternative to conventional fixed appliances, particularly among adults concerned about appearance.<sup>4</sup>

Despite advancements in orthodontic techniques, public awareness and understanding of available treatment options remain variable. Patient cooperation, treatment compliance, and overall satisfaction are influenced by psychological factors and quality-of-life considerations.<sup>5,7,8</sup> Awareness regarding treatment modalities, duration, cost, and maintenance requirements plays a crucial role in treatment acceptance and outcomes.<sup>6</sup>

In order to compare awareness of aligners with fixed mechanotherapy for full orthodontic treatment, the goal was to gather and document those who received orthodontic treatment. As of yet, no research has compared the effectiveness of aligners with fixed mechanotherapy. This

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could be used to determine the best course of treatment. This study aimed to support a comparative assessment of young people' knowledge regarding fixed orthodontic mechanotherapy and aligners.

## MATERIALS AND METHOD:

This was a cross-sectional descriptive study carried out in 2026 A multiple-choice questionnaire containing 16 questions was distributed via Google forms amongst Young adults. The respondents were reached using email and WhatsApp messenger. A total of 150 students responded. The questionnaire focused on the knowledge about fixed mechanotherapy and clear aligner therapy and techniques involved. This included the biomechanics, type of material used as well as the specific attachments used. The data was then organized in the form of pie-charts and graphs and was tabulated to calculate the percentage score for each question. To calculate the percentage score for each question.

### Statistical Analysis

The collected data were entered into Microsoft Excel and analyzed. Descriptive statistics were used to summarize the data. Categorical variables such as age, gender, location, educational qualification, occupation, awareness of orthodontic treatment, treatment preference, and perception-related variables were expressed as frequency (n) and percentage (%). The association between demographic variables (education, gender, and location) and awareness-related variables was assessed using the Chi-square ( $\chi^2$ ) test. A p-value of less than 0.05 was considered statistically significant. The results were presented in the form of tables and percentages for easy interpretation.

## RESULTS

### 1. Participant Characteristics

A total of 150 participants were included in the study.

#### Demographic Characteristics

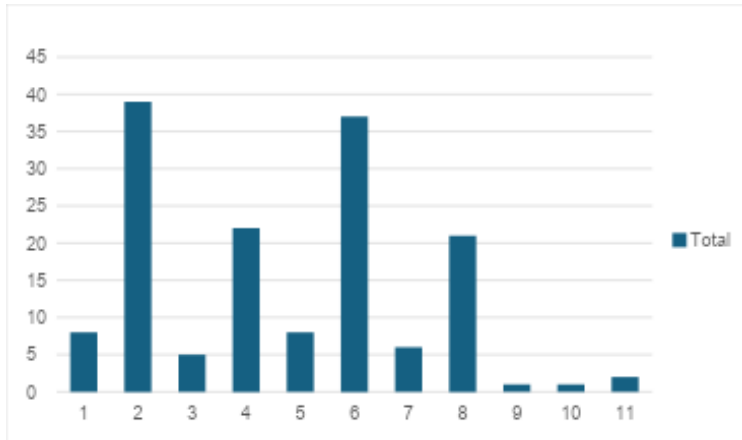
The majority of participants were in the 18–21 years (49.3%) and 22–25 years (48.7%) age groups, while only 2% were aged 26–30 years. Females constituted 63.3% (n=95) of the study population and males 36.7% (n=55). Most respondents were from urban areas (81.3%), with only 18.7% residing in rural areas. Students formed the largest occupational group (50.7%), followed by employed individuals (44.0%) and unemployed participants (5.3%).

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**Commented [ra6]:** The Materials and Methods section is not sufficiently detailed to ensure methodological reproducibility or to judge the validity of the findings. The manuscript states that a 16-item multiple-choice questionnaire was distributed through Google Forms, email, and WhatsApp, but it does not describe the sampling strategy, eligibility criteria, questionnaire development process, pilot testing or validation, or whether ethical approval and informed consent were obtained. These are essential elements for a questionnaire-based cross-sectional study. Also The manuscript states that the questionnaire was distributed among "young adults," but then reports that "150 students responded," without clearly defining whether the sample included only students or a broader young adult population.

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**Figure 1: Demographic data**

The graphical representation indicates that Items 2 and 6 received the highest number of responses (approximately 38–40 participants), suggesting relatively stronger awareness in these areas. Items 4 and 8 showed a moderate level of responses (around 20–22 participants), reflecting an average understanding among respondents. Conversely, Items 1, 3, 5, and 7 recorded comparatively fewer responses (approximately 5–8 participants), pointing toward lower levels of awareness in those domains. Notably, Items 9, 10, and 11 demonstrated only minimal responses (about 1–2 participants), indicating limited recognition or understanding of these particular aspects within the study group.

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Variable	Category	n	%
<b>Age (years)</b>	18–21	74	49.3
	22–25	73	48.7
	26–30	3	2.0
<b>Gender</b>	Female	95	63.3
	Male	55	36.7
<b>Location</b>	Urban	122	81.3
	Rural	28	18.7
<b>Occupation</b>	Student	76	50.7

Variable	Category	n	%
	Employed	66	44.0
	Unemployed	8	5.3

Table 1. Demographic Characteristics of Participants (N = 150)

Variable	Category	n	%
Heard about orthodontic treatment (n=149)	Yes	133	89.3
	No	16	10.7
Type of treatment aware (n=150)	Metal braces	109	72.7
	Clear aligners	29	19.3
	Ceramic braces	12	8.0
Preferred treatment (n=148)	Fixed braces	120	80.9
	Clear aligners	25	16.9
	Not sure	3	2.0
Aligners more expensive? (n=149)	Yes	115	77.2
	No	10	6.7
	Not sure	24	16.1

Table 2. Awareness and Perception of Orthodontic Treatment

Variable	$\chi^2$	df	p-value	Significance
Type of treatment aware	1.90	4	0.755	NS
Heard about orthodontics	0.208	2	0.901	NS
Source of information	4.20	8	0.838	NS

Variable	$\chi^2$	df	p-value	Significance
Undergoing treatment	1.18	4	0.881	NS
Type chosen	4.21	4	0.378	NS
Willingness for future treatment	12.7	4	<b>0.013</b>	<i>Significant</i>
Influencing factor	2.39	8	0.966	NS
Treatment preference	2.68	4	0.612	NS
Aligners more expensive	0.889	4	0.926	NS
Follow-up awareness	4.26	4	0.372	NS

Table 3. Association Between Educational Qualification and Awareness Variables

Variable	$\chi^2$	df	p-value	Significance
Type of treatment aware (Urban)	6.26	2	<b>0.044</b>	<i>Significant</i>
Type of treatment aware (Rural)	5.49	2	0.064	NS
Aligners more expensive (Total)	3.57	2	0.168	NS
Treatment preference (Total)	1.86	2	0.394	NS

Table 4. Association Between Gender and Awareness Variables (Chi-square test was used to assess associations. Statistical significance was set at  $p < 0.05$ .)

## 2. Awareness of Orthodontic Treatment

### General Awareness

Out of 150 respondents, 89.3% (n=133) reported that they had heard about orthodontic treatment for teeth alignment.

### Awareness of Treatment Types

Among participants:

**Metal braces (fixed mechanotherapy)** were the most recognized treatment (72.7%).

**Clear aligners** were known to 19.3%.

**Ceramic braces** were known to 8.0%.

### **Source of Information**

The most common sources of information were:

Family and friends (55.3%)

Dentists (36.7%)

Social media (5.3%)

Television/radio (2.0%)

Advertisement(0.7%)

### **3. Treatment Experience and Attitude**

#### **Previous or Current Orthodontic Treatment**

A majority of participants (78.0%) reported having undergone or currently undergoing orthodontic treatment.

#### **Type of Treatment Chosen**

Among those treated:

Fixed braces were the most commonly chosen option (84.0%).

Clear aligners were selected by 13.3%.

Other options accounted for 2.7%

#### **Willingness for Future Treatment**

A significant proportion of respondents (92.6%) indicated that they would consider orthodontic treatment in the future if required.

### **4. Factors Influencing Treatment Choice**

The most commonly reported influencing factor was:

Cost of treatment (67.1%)

Esthetic appearance (17.4%)

Duration of treatment (8.7%)

Dentist recommendation (6.0%)

Peer influence (0.7%)

### **5. Preference Between Fixed Braces and Clear Aligners**

When both options were assumed to be available:

80.9% preferred fixed braces

16.9% preferred clear aligners

2.0% were unsure

### **6. Perception of Cost and Maintenance**

77.2% believed clear aligners are more expensive than fixed braces.

62.8% were aware that both treatments require regular follow-ups and oral hygiene maintenance.

### **7. Association Between Educational Qualification and Awareness**

Chi-square tests were performed to assess associations between educational qualification and awareness-related variables.

No statistically significant association was observed between educational qualification and:

Awareness of treatment types ( $\chi^2=1.90$ ,  $p=0.755$ )

Knowledge about orthodontic treatment ( $\chi^2=0.208$ ,  $p=0.901$ )

Source of information ( $\chi^2=4.20$ ,  $p=0.838$ )

Treatment preference ( $\chi^2=2.68$ ,  $p=0.612$ )

Perception of cost ( $\chi^2=0.889$ ,  $p=0.926$ )

Awareness of follow-up requirements ( $\chi^2=4.26$ ,  $p=0.372$ )

However, a statistically significant association was found between educational qualification and willingness to undergo orthodontic treatment in the future ( $\chi^2=12.7$ ,  $p=0.013$ ), indicating that educational status influenced treatment consideration.

### **8. Association Between Gender, Location and Awareness**

A statistically significant association was observed between gender and awareness of orthodontic treatment types among the urban population ( $\chi^2=6.26$ ,  $p=0.044$ ), suggesting differences in awareness patterns between males and females in urban areas.

No statistically significant association was found between gender and:

Perception of cost (p=0.168)

Treatment preference (p=0.394)

## DISCUSSION:

The present study explored the level of awareness about orthodontic treatment options, particularly fixed orthodontic mechanotherapy and clear aligner therapy, among young adults in Tamil Nadu. Understanding how well individuals are informed about these treatment modalities is important because awareness can influence treatment acceptance, expectations, and oral health decisions<sup>16</sup>.

The results suggest that most participants were more familiar with conventional fixed orthodontic appliances than with clear aligner systems. This observation may be explained by the long history and common visibility of fixed braces in dental practice and in the community<sup>1</sup>. In contrast, aligner therapy represents a more recent technological advancement in orthodontics<sup>2, 9</sup> and may not yet be widely understood by all sections of the population.

Another key finding of this study is that aesthetic improvement appears to be a major reason for considering orthodontic treatment among young adults. Modern society places significant importance on facial appearance and smile esthetics, which significantly influence psychosocial well-being and treatment-seeking behavior<sup>11, 20</sup>. Therefore, individuals may seek orthodontic care not only for functional correction but also for enhancement of their overall appearance and self-confidence.

At the same time, the findings indicate that awareness about the broader functional benefits of orthodontic treatment is comparatively limited among some participants. Orthodontic therapy plays an important role in improving occlusion, maintaining oral hygiene, and preventing long-term dental complications<sup>16</sup>. Limited understanding of these functional aspects highlights the need for improved patient education and public health awareness initiatives.

Sources of information may also contribute to the awareness levels observed in this study. Digital platforms and advancements in orthodontic technology have significantly influenced public perception of newer treatment modalities such as clear aligners<sup>5, 21</sup>. Increased exposure to accurate information through professional guidance and verified educational sources could help improve knowledge and correct misconceptions.

Although this study provides useful insights, certain limitations should be considered when interpreting the results. The study focused only on young adults; therefore, the findings may not represent awareness levels in other age groups. Additionally, questionnaire-based surveys may introduce response bias, as participants may answer based on perceived expectations. Future research involving larger and more diverse populations is recommended to obtain a broader understanding of awareness regarding orthodontic treatment options.

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Overall, the findings of the present study suggest that while knowledge about fixed orthodontic treatment is relatively widespread, awareness of clear aligner therapy is still developing. Strengthening patient education and improving communication between dental professionals and the public may help individuals gain a clearer understanding of available orthodontic treatments and support informed decision-making.

## conclusion

Within the limitations of this cross-sectional questionnaire-based study, the findings indicate that young adults in Tamil Nadu demonstrate a moderate level of awareness regarding orthodontic treatment, including fixed orthodontic mechanotherapy and aligner therapy. A higher proportion of participants were familiar with conventional fixed braces compared to clear aligners, although awareness of aligner therapy is increasing.

The results suggest that while general knowledge about orthodontic treatment and its impact on facial aesthetics is present, gaps remain regarding treatment duration, comfort, and comparative benefits of different modalities. Increased educational initiatives and awareness programs may help improve understanding and promote informed decision-making among young adults

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UNDER PEER REVIEW

