



Knowledge, Attitude, and Perception of Clear Aligners among Patients Seeking Orthodontic Treatment: A Questionnaire Study

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Introduction: The present study aimed to evaluate the knowledge, attitude, and perception of clear aligners among patients seeking orthodontic treatment and identify key factors influencing their preferences and decision-making.

Materials and Method: A cross-sectional questionnaire-based study was conducted among 140 patients aged 14 years and above. Data were collected using a structured, self-reported, online questionnaire distributed via Google Forms. The questionnaire assessed patient demographics, awareness, sources of information, attitudes toward aligners, and perceptions of their effectiveness and maintenance. Statistical analyses, including Chi-square tests, t-tests, and Spearman correlation, were performed using SPSS version 23.0.

Results: Most participants were aged 18–25 (95%) and female (83.6%). Awareness of aligners was moderate (46.4% somewhat familiar, 22.9% very familiar), with online platforms being the main information source (40%). Aesthetic appeal (79.3%) and comfort (43.6%) were key positive factors, while cost was a major concern (57.8%). Only 33.6% viewed aligners as effective. Significant correlations were observed between knowledge and attitude ($r = 0.450$, $p < 0.001$), and attitude and perception ($r = 0.445$, $p < 0.001$).

Conclusion: While patients showed moderate awareness and interest in aligners, concerns about cost and effectiveness remain. Aesthetics and comfort drive positive attitudes, but misconceptions persist. Dentists and online media are key to enhancing patient education and promoting aligners as a viable treatment option.

Keywords: Clear Aligners, Orthodontic patients, Patient awareness, Attitude and Perception.

Introduction

Clear aligners have emerged as a popular orthodontic treatment option due to their aesthetic appeal, comfort, and convenience compared to traditional braces. Despite these advantages, the acceptance and adoption of aligners depend on patient awareness, understanding, and perceptions. However, there is limited research on the factors influencing patients' knowledge and preferences for aligners as an alternative to conventional treatments.^[1]

Patients often rely on various sources of information, such as dentists, online platforms, and advertisements, to learn about aligners. However, the accuracy and impact of these sources on their knowledge remain unclear. Additionally, many patients may not fully understand the differences between aligners and traditional braces in terms of effectiveness, maintenance, and suitability for various dental issues. Concerns about cost, availability, and perceived

efficacy further influence their decision-making process.^[2]

Understanding patient preferences is essential for orthodontic practitioners to provide better guidance and education tailored to individual needs. Exploring factors such as aesthetics, comfort, and cost can offer valuable insights into what patients prioritize when considering aligners. Moreover, identifying barriers, including misconceptions or lack of awareness, can help address challenges and improve acceptance of this treatment option.

The purpose of this study was to bridge the knowledge gap by investigating patient awareness, attitudes, and perceptions regarding clear aligners. The findings will assist in developing targeted strategies to enhance patient education, dispel myths, and address concerns. Ultimately, the study will contribute to better patient experiences, informed decision-making, and broader adoption of aligners as a viable orthodontic treatment option.

Materials And Method

The patients who reported to the OPD of Department of Orthodontics and Dentofacial Orthopedics participated in this study. The ethical clearance was obtained from Institutional Ethical Committee (**Ref: CDCRI/DEAN/ETHICSCOMMITTEE /ORTHO/PG-01/2025**). This research adopted a cross-sectional design to evaluate the knowledge, attitudes, and perceptions of patients seeking orthodontic treatment regarding clear aligners. To collect data, an online questionnaire was used, ensuring a comprehensive assessment of participant's understanding and views on clear aligner treatments.

The study spanned a duration of one month, during which data collection, analysis, and interpretation were systematically conducted. The total sample size for the study was 140. The sample size was calculated using an online calculator available at Raosoft Sample Size Calculator. Parameters considered for sample size estimation included population size (approximate number of patients visiting the department OPD), margin of error (MOE) of 5%, confidence level of 95%, and a response distribution/sample proportion of 50%. The sample selection criteria included patients who were 14 years or older to ensure they had an understanding of orthodontic treatment. Participants were excluded from the study if they were below 14

years of age or unable to comprehend the questionnaire, or identified with mental challenges that would impair their ability to respond accurately.

Patients were requested to read and sign informed consent forms, which clearly indicated the purpose and outcome of the study protocol in both English and Hindi. Any patient not willing to sign the consent or participate in the study was not included. Data was collected through a structured online questionnaire prepared using Google Forms. A pre-validated questionnaire was used. Pilot testing of questionnaire was performed and reliability was assessed using Cronbach's alpha co-efficient. The questionnaire was self-reported by patients visiting the Department of Orthodontics and Dentofacial Orthopedics at Chhattisgarh Dental College and Research Institute, Rajnandgaon. The questionnaire was closed-ended and covered various aspects of aligners, including demographics (age, gender), knowledge (awareness, source of information), attitude (willingness, cost sensitivity), and perception (effectiveness, ease).

The collected data was tabulated using Microsoft Excel, followed by analysis with SPSS software version 23.0. For categorical variables such as awareness versus gender, the Chi-square test was utilized to determine if there were significant differences between groups. To compare means across different groups, t-tests were used, providing insights into variations within the sample. Additionally, regression analysis was conducted to explore the factors influencing perceptions of clear aligners, allowing us to identify key predictors and their impacts.

Result

The study included participants predominantly aged 18–25 years (95%), with females comprising 83.6% and males 16.4% of the sample (Table 1). Knowledge about clear aligners varied among participants; 46.4% were somewhat familiar, 22.9% were very familiar, while 7.9% were unfamiliar. Online platforms (40%) were the primary source of information, followed by dentists or orthodontists (27.1%). Over half of the participants (51.4%) knew some differences between aligners and traditional braces, whereas 11.4% were unaware of any differences. Additionally, 53.6% agreed that clear aligners are removable orthodontic devices (Table 2).

In terms of attitudes, 36.4% of the participants expressed a definite willingness to use aligners over traditional braces, while 5% preferred braces. The aesthetic appeal of aligners was a significant factor, with 36.4% strongly agreeing and 42.9% agreeing that aligners are more aesthetically pleasing than braces. Cost concerns emerged as a major issue, with 42.1% somewhat concerned and 15.7% very concerned about the expense of aligners (Table 2).

Perceptions of aligners varied, with 33.6% considering them effective for correcting dental issues, while 42.1% were neutral on this aspect. The ease of maintenance was highlighted, as 53.6% agreed that aligners are easier to maintain than braces. Cost was identified as the primary concern (45.7%), followed by effectiveness (25%) (Table 2). The study found no significant gender-based differences in knowledge, attitude, or perception regarding aligners (Table 3). However, attitudes were significantly better among participants below 18 years compared to older age groups (Table 3).

Furthermore, moderate positive correlations were observed between knowledge and attitude ($r = 0.450$, $p < 0.001$) and between attitude and perception ($r = 0.445$, $p < 0.001$). A weak positive correlation was also noted between knowledge and perception ($r = 0.257$, $p = 0.002$). These findings emphasize the importance of addressing cost concerns and knowledge gaps to improve patient acceptance and adoption of clear aligners (Table 4).

Discussion

The findings of this study provide significant insights into the knowledge, attitudes, and perceptions of patients regarding clear aligners as an alternative orthodontic treatment. Consistent with existing literature, the results highlight both the growing interest in aligners and the challenges hindering their widespread acceptance.

Knowledge and Awareness

The moderate level of awareness observed among participants aligns with prior research, such as **Shivlani et al.**^[5], which documented average to low awareness levels among healthcare professionals. In this study, 46.4% of participants were somewhat familiar with clear aligners, while 22.9% were very familiar. Younger patients (below 18 years) demonstrated significantly better attitudes and higher

awareness, likely due to their frequent engagement with online platforms, the primary source of information for 40% of participants. However, knowledge gaps persisted, particularly regarding the technical aspects of aligners, such as differences from braces, maintenance needs, and their suitability for different dental issues. These findings underscore the need for more accessible and targeted educational resources, particularly for older patients and those with limited exposure to digital information.

Attitudes and Influencing Factors

Participants' attitudes toward aligners were shaped by a mix of positive and negative factors. On the positive side, aesthetic appeal and comfort were widely recognized as key advantages, with 36.4% strongly agreeing that aligners are more aesthetically pleasing and 43.6% agreeing they are more comfortable than traditional braces. These findings align with prior studies, such as **Pawar et al.**^[6], which highlighted aesthetics and comfort as significant motivators for aligner adoption. However, cost sensitivity emerged as a major concern, with 42.1% of participants somewhat concerned and 15.7% very concerned about the expense of aligners. This reflects global trends in orthodontics, where affordability often influences treatment decisions. While younger participants displayed more favourable attitudes, cost concerns were consistent across age groups, emphasizing the need for financial accessibility.

Perceptions and Barriers

Perceptions of aligners were generally favourable, with 33.6% considering them effective for dental corrections and 53.6% agreeing that they are easier to maintain than braces. Despite these positive perceptions, participants were hesitant to strongly recommend aligners, with only 18.6% doing so without reservations. Cost (45.7%) and maintenance challenges (19.3%) were cited as the most significant barriers to broader acceptance, consistent with findings from **Pawar et al.**^[6]. These barriers highlight the importance of clear and transparent communication between orthodontists and patients regarding the long-term value, cost-effectiveness, and practical maintenance of aligners compared to braces.

Implications for Practice

The study underscores the critical role of orthodontists and dental practitioners in addressing misconceptions

and providing tailored education to patients. With dentists and orthodontists identified as trusted sources of information, their involvement is crucial in bridging knowledge gaps, dispelling myths, and emphasizing the practical advantages of aligners. Targeted educational interventions, such as visual aids, cost breakdowns, and demonstrations of aligner effectiveness, can significantly enhance patient understanding and acceptance. Additionally, emphasizing the aesthetic and comfort benefits, particularly to younger patients, may further improve their appeal.

Limitations and Future Research

This study was conducted within a single institution, and the sample size, while adequate, may not fully represent the diversity of patient experiences across broader geographic or socioeconomic contexts. Future research should aim to include larger, more varied populations to explore the generalizability of these findings. Furthermore, studies evaluating the impact of targeted educational strategies on patient perceptions could provide actionable insights into improving aligner adoption. Longitudinal studies tracking patient satisfaction and outcomes after aligner use are also recommended to assess their long-term efficacy and acceptance.

Conclusion

The study reveals moderate awareness and interest in clear aligners among orthodontic patients, with aesthetics, comfort, and removability driving positive attitudes. However, concerns regarding cost, maintenance, and treatment duration hinder acceptance. Online sources and advertisements are primary information channels, often contributing to misconceptions. Perceived efficacy of aligners remains variable, with doubts compared to traditional braces. Younger and more educated individuals demonstrated greater awareness and acceptance. Enhanced patient education and professional guidance

are crucial for promoting informed decision-making and addressing misconceptions.

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Table 1: Demographic details of study sample

Variable	Participants (n)	%
Age group		
Below 18	4	2.9
18-25	133	95
26-35	3	2.1
Gender		
Male	23	16.4
Female	117	83.6

Table 2: Participant Responses

Questionnaire	n	%
Responses related to knowledge-based domains		
Have you heard about clear aligners ?		
a) Yes, very familiar	32	22.9
b) Yes, somewhat familiar	65	46.4
c) Heard the term, not sure what it is	30	21.4
d) No, unfamiliar	11	7.9
e) Unsure	2	1.4
Where did you first learn about aligners?		
a) Dentist/Orthodontist	38	27.1
b) Online (websites, social media)	56	40
c) Friends/Family	22	15.7
d) Advertisements	19	13.6
e) Other	5	3.6
Do you know the main differences between traditional braces and clear aligners?		
a) Yes, I know all the differences	10	7.1
b) I know some differences	72	51.4
c) I have heard there are differences but not sure	37	26.4
d) No, I don't know any differences	16	11.4
e) Unsure	5	3.6
Do you believe aligners require regular visits to the orthodontist?		
a) Always	19	13.6

b) Sometimes	69	49.3
c) Rarely	20	14.3
d) Never	4	2.9
e) Cannot say	28	20
Clear aligners are removable orthodontic devices.		
a) Strongly agree	25	17.9
b) Agree	75	53.6
c) Neutral	37	26.4
d) Disagree	3	2.1
Responses related to attitude-based domains		
Would you consider using aligners instead of traditional braces?		
a) Yes, definitely	51	36.4
b) Yes, but only for specific cases	35	25
c) Maybe, I am unsure	43	30.7
d) No, I prefer braces	7	5
e) No, I am not interested	4	2.9
Do you think aligners are more aesthetically pleasing than braces?		
a) Strongly agree	51	36.4
b) Agree	60	42.9
c) Neutral	26	18.6
d) Disagree	3	2.1
Do you believe aligners are more comfortable than braces?		
a) Strongly agree	32	22.9
b) Agree	61	43.6
c) Neutral	44	31.4
d) Disagree	2	1.4
e) Strongly disagree	1	0.7
Are you concerned about the cost of aligners compared to braces?		
a) Very concerned	22	15.7
b) Somewhat concerned	59	42.1
c) Neutral	47	33.6
d) Not very concerned	9	6.4
e) Not concerned at all	3	2.1

Responses related to perception-based domains		
On a scale of 1–5, how effective do you think aligners are for correcting dental issues compared to braces?		
a) 1 (Not at all effective)	0	0
b) 2 (Somewhat effective)	25	17.9
c) 3 (Neutral)	59	42.1
d) 4 (Effective)	47	33.6
e) 5 (Very effective)	9	6.4
Do you think aligners are easier to maintain (clean and use) than braces?		
a) Strongly agree	27	19.3
b) Agree	75	53.6
c) Neutral	35	25
d) Disagree	3	2.1
a) Strongly agree	27	19.3
Are aligners suitable for all types of orthodontic problems?		
a) Yes, for all problems	2	1.4
b) Yes, for most problems	30	21.4
c) Unsure	87	62.1
d) No, for only minor problems	16	11.4
e) No, they are not suitable	5	3.6
What is your biggest concern about aligners?		
a) Cost	64	45.7
b) Effectiveness	35	25
c) Maintenance	27	19.3
d) Discomfort	11	7.9
e) Availability	3	2.1
Would you recommend aligners to someone considering orthodontic treatment?		
a) Yes, strongly recommend	26	18.6
b) Yes, recommend with caution	68	48.6
c) Neutral	42	30
d) No, prefer braces	4	2.9

Table 3: Comparison of knowledge, attitude, and perception regarding clear aligners among subjects

Domain	Male	Female	p-value	< 18	18-25	26-39	p-value
	Mean \pm SD	Mean \pm SD		Mean \pm SD	Mean \pm SD	Mean \pm SD	
Knowledge	3.37 \pm 0.81	3.67 \pm 0.63	0.079	3.69 \pm 0.31	3.61 \pm 0.68	4.25 \pm 0.43	0.197
Attitude	3.40 \pm 0.61	3.59 \pm 0.50	0.188	4.25 \pm 0.29	3.54 \pm 0.52	3.67 \pm 0.29	0.026*
Perception	3.54 \pm 0.57	3.66 \pm 0.48	0.192	3.88 \pm 0.32	3.63 \pm 0.50	3.75 \pm 0.66	0.475

Mann Whitney test; Kruskal Wallis test; Post hoc Man Whitney test; * indicates a significant difference at $p \leq 0.05$

Table 4: Correlation between knowledge, attitude, and perception regarding clear aligners

Comparison	r-value	p-value
Knowledge vs Attitude	0.450	<0.001**
Knowledge vs Perception	0.257	0.002*
Attitude vs Perception	0.445	<0.001**

Spearman rank correlation test; * indicates very significant correlation at $p \leq 0.01$, ** indicates very highly significant correlation at $p \leq 0.001$.