

# Evaluation of Aligners from the perspective of an Orthodontist and General Dentist

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## ABSTRACT

**Background:** Aligners are a relatively new technique in dentistry for achieving tooth alignment. While their aesthetic appeal is undeniable, the perception among orthodontists and general dentist needs to be evaluated.

**Aims and Objectives:** This study aimed to evaluate the perception of orthodontic aligners among general dentists and orthodontists in India.

**Materials and Method:** A cross-sectional survey including 200 practicing general dentists and orthodontists was carried out using a web-based questionnaire (17 questions for orthodontists, 14 for dentists) was developed and distributed through social media platforms. The questionnaire addressed use of aligner, digital workflow, case selection, challenges encountered, treatment outcomes, and views on in-home digital scanning. Responses were tabulated and analyzed as percentages.

**Result:** Overall, 66.3% of practicing orthodontists and 82.6% of general dentists have aligner treatment facility in their clinic out of which 19.5 % of general dentist practice aligners on their own. Reluctance to use aligners stemmed from perceived high cost, patient compliance concerns, unpredictable results, and lack of training. Most treated cases were mild, non-extraction discrepancies. Interestingly, over 50% of general dentists supported the concept of in-home digital scanning. 75% of orthodontists acknowledged the need to switch to alternative orthodontic appliances and use of auxiliaries to achieve desired outcomes.

**Conclusion:** Not only orthodontists but majority of general dentists were also aware of aligners and are practicing it, stressing on its increased use as treatment modality for correcting orthodontic cases with discrepancies not necessitating teeth extraction in adult subjects.

**KEYWORDS:** Orthodontic aligners, General dentists, Orthodontists, Treatment outcome, Perception.

## INTRODUCTION

Orthodontic treatment has come a long way from banding of all teeth to bonding of teeth, from labial to lingual Orthodontics, from visible Orthodontics to invisible options like lingual braces and aligners. Aligners being aesthetically pleasing and comfortable to the patient has grabbed the attention of many adult patients seeking orthodontic treatment. As aligners doesn't include placing of brackets, wires and little use

of biomechanics, they have grabbed the attention of General Dentists too. However, aligners have been in controversies because of its use, misuse, its present advantages, limitations, the treatment outcome and marketing of DIY (do it yourself) aligners etc.

Aligners were initially introduced to treat minor irregularities of tooth position only. With rapid advances in technologies (CAD-CAM, stereolithography and tooth-movement simulation software) the kind of cases being

treated with aligners has increased while some aligner companies also claim to target complex malocclusion. The published clinical evidence supporting such claims is either lacking or, for the most part, well short of high-level scientific evidence.<sup>1</sup>

Many aligner systems are marketed directly to the public, some companies have been supplying aligners directly to non-specialists and some do not even require the intervention of any dental practitioner at any stage in the process.<sup>2</sup>

Survey based evaluation on perception of aligners between Orthodontists and General Dentist has been done in previous study by d'Apuzzo et al.<sup>3</sup> however the comparison has yet not been done in Indian population. In these past few years because of commercialization of aligners and high aesthetic demand among youths, aligners companies have been springing up like mushrooms in India. Considering this the aim of the present study was to appraise the knowledge, awareness and practice of aligners among General Dentists and Orthodontists. A web-based survey is developed in an approach to evaluate the awareness about Orthodontic aligners among General Dentists and Orthodontists to understand this dilemma on how futuristic aligners can

form critical perspective of an orthodontist and general dentist through a questionnaire.

## MATERIAL AND METHOD

A web-based survey was done using a questionnaire which was in google form and circulated to 200 participants using various social media platforms. The participants comprised of 86 Orthodontists and 85 General Dentists practicing in various parts of India. Separate questionnaire in the form of MCQ was prepared for Orthodontists and General Dentists. The questionnaire for Orthodontists comprised of 17 questions (Table-1) involving their practice of aligners, the kind of digital records they have been using, case selection, challenges they face during the treatment, how they overcome it and its treatment outcome. The questionnaire for General Dentist comprised of 14 questions (Table-2) regarding their knowledge on aligners, digital records they use, the problems they face while treating a case with aligners, their view on in home digital scanning and their level of Satisfaction with the treatment outcome. The participants had to tick one or more options for each question. The data of responses of participants were tabulated and expressed as percentage and accessed for perception of aligners.

Table 1: Questions for Orthodontists.

Sl no.	Question	Option A	Option B	Option C	Option D	Option E
1	Which part of the country are you from	East	West	North	South	Northeast
2	Do you practice aligners as a treatment option	yes	no			
3	what is the reason for no using aligners	they don't give me the kind of result I want	I don't want to depend on my patient's compliance for success of treatment	It is expensive	My patients don't ask for it	lack of training
4	What percentage of your patient have you been treating with aligners	less than 10%	10-25%	25-50%	more than 50%	
5	Has the number of patients you treat with aligners changed over past years	it has increased	it has decreased	it has stayed the same.		

6	What type of digital records do you provide to aligner companies for fabrication of aligners	intraoral optical scanners	transferring of PVS Impression	impression model and lab scanning		
7	Which company aligner do you commonly deliver					
8	Which age group patients do you use aligners for?	adults	teens	any patient who request them	all patients	
9	What kind of cases do you use aligner for	non-extraction cases with mild discrepancy	non-extraction cases with severe discrepancy	extraction cases		
10	Do you feel the need to switch to other orthodontic appliance system (when desired result is not achieved with aligners)	yes	no	sometimes		
11	What kind of orthodontic modality you usually shift to	I don't use	With standard brackets	With aesthetic brackets	With lingual brackets	With removable appliances
12	You found periodontal health to be better in	Aligners 89.10%	Fixed orthodontic treatment 14.50%			
13	Time duration -	decreases with the use of aligners	increases with the use of aligners	remain same as fixed orthodontic treatment		
14	What are the major challenges you face while treating a patient with aligners	Dependency on patient compliance	high cost	Control over the kind of tooth movement I want	Results are not up to the mark.	
15	How satisfied are you with the occlusal outcome of aligners	1-4%	5-8%	9-10%		
16	On a scale of 1-10 how satisfied are you with the results you get using aligners	1-4%	5-8%	9-10%		
17	View on use of aligner in near future.					

Table 2: Questions for General Dentists.

Sl no.	Question	Option A	Option B	Option C	Option D	Option E
1	Which part of the country are you from	East	West	North	South	Northeast
2	How many years have you been practicing dentistry for	1-10 yrs	10-20 yrs	> 20 yrs		
3	Is Orthodontic treatment facility available in your clinic	yes	no			
4	Who does the treatment	Orthodontist	General Dentist			
5	What all orthodontic facilities are available in your clinic	Fixed orthodontic treatment	Removable Appliance treatment	Lingual orthodontic treatment	Aligner 25.60%	all 61%
6	Are you aware of aligners	yes	no			
7	Are you a part of any aligner company	yes	no			
8	How often you recommend your patient for an orthodontically planned aligner	Always	Only when the case is difficult	No, I do the treatment myself		
9	What kind of cases do you treat with aligners.	non-extraction cases with mild cases	extraction cases with severe discrepancy	Extraction cases.	All	
10	What is your opinion about in-home digital scanning for aligners	support it	against it			
11	What type of digital records do you provide to aligner companies for fabrication of aligners	intra-oral optical scanners	Transferring of PVS Impression	Impression model and Lab scanning		
12	Are you satisfied with the treatment outcome of aligners	yes	no			
13	On a scale of 1-10 how satisfied are you with the treatment outcome of aligners	1 to 4	5 to 6	7 to 8	9 to 10	
14	Are you aware of the Indian Orthodontic Society (IOS) and its guidelines	yes	no			

## RESULT

Table 3 and 4 shows responses of orthodontists and general dentist to know their knowledge and perception of aligners. 66.3% of practicing orthodontists and 82.6% of general dentists have aligner treatment facility in their clinic out of which 19.5 % of general dentist practice aligners on their own. Reluctance to use aligners stemmed from perceived high cost, patient compliance concerns, unpredictable results, and lack of training. Most treated cases were mild,

non-extraction discrepancies. Interestingly, over 50% of general dentists supported the concept of in-home digital scanning. 75% of orthodontists acknowledged the need to switch to alternative orthodontic appliances and use of auxiliaries to achieve desired outcomes. Both orthodontist and general dentist were aware of use of aligners as orthodontic modality General dentists were not selective of cases to be treated with aligners where is orthodontics preferred non extraction cases with mild to moderate discrepancies.

Table 3: Responses obtained from orthodontists

Sl no.	Question	Option A	Option B	Option C	Option D	Option E
1	Which part of the country are you from	East (12.30%)	West (9.90%)	North (64.20%)	South (9.90%)	Northeast (3.70%)
2	Do you practice aligners as a treatment option	yes (66.30%)	no (33.70%)			
3	what is the reason for no using aligners	they don't give me the kind of result I want (28.60%)	I don't want to depend on my patient's compliance for success of treatment (17.90%)	It is expensive (28.60%)	My patients don't ask for it (32.10%)	lack of training (10.85%)
4	What percentage of your patient have you been treating with aligners	less than 10% (63.60%)	Between 10-25% (29.1 %)	Between 25-50% (7.30%)	more than 50% (0)	
5	Has the number of patients you treat with aligners changed over past years	it has increased (72.70%)	it has decreased (1.80%)	it has stayed the same (25.50%)		
6	What type of digital records do you provide to aligner companies for fabrication of aligners	intraoral optical scanners (52.70%)	transferring of PVS Impression (32.75 %)	impression model and lab scanning (14.50%)		
7	Which company aligner do you commonly deliver	Clearcorrect	Flash aligner	Flexalign	Illusion	Invisalign
8	Which age group patients do you use aligners for?	adults (50.90%)	teens (20%)	any patient who request them (32.70%)	all patients (10.90%)	
9	What kind of cases do you use aligner for	non-extraction cases with mild discrepancy (89.10%)	non-extraction cases with severe discrepancy (3.60%)	extraction cases (7.30%)		

10	Do you feel the need to switch to other orthodontic appliance system (when desired result is not achieved with aligners)	yes (36.40%)	no (29.10%)	sometimes (34.50%)		
11	What kind of orthodontic modality you usually shift to	I don't use (23.60%)	With standard brackets (47.30%)	With esthetic brackets (34.50%)	With lingual brackets (9.10%)	With removable appliances (9.10%)
12	You found periodontal health to be better in	Aligners (89.10%)	Fixed orthodontic treatment (14.50%)			
13	Time duration -	decreases with the use of aligners (34.50%)	increases with the use of aligners (27.30%)	remain same as fixed orthodontic treatment (38.20%)		
14	What are the major challenges you face while treating a patient with aligners	Dependency on patient compliance (54.50%)	high cost (61.80%)	Control over the kind of tooth movement I want (45.50%)	Results are not up to the mark (25.50%)	
15	How satisfied are you with the occlusal outcome of aligners	1-4% (9.10%)	5-8% (80%)	9-10% (10.90%)		
16	On a scale of 1-10 how satisfied are you with the results you get using aligners	1-4% (3.60%)	5-8% (83.70%)	9-10% (12.70%)		

Table 4: Responses obtained from General Dentist.

Sl no.	Question	Option A	Option B	Option C	Option D	Option E
1	Which part of the country are you from	East (18.30%)	West (4.90%)	North (57.30%)	South (6.10%)	Northeast (13.40%)
2	How many years have you been practicing dentistry for	1-10 yrs (62)	10-20 yrs (19)	> 20 yrs (3)		
3	Is Orthodontic treatment facility available in your clinic	yes (90.2)	no (9.8)			
4	Who does the treatment	orthodontist (85%)	general dentist (19.50%)			
5	What all orthodontic facilities are available in your clinic	Fixed orthodontic treatment (45.10%)	Removable Appliance treatment (47.60%)	Lingual orthodontic treatment (25.60%)	Aligner (25.60%)	all (61%)

6	Are you aware of aligners	yes (93.90%)	no (6.10%)		
7	Are you a part of any aligner company	yes (14.60%)	no (85.40%)		
8	How often you recommend your patient for an orthodontically planned aligner	Always (52.40%)	Only when the case is difficult (32.90%)	No, I do the treatment myself (17.10%)	
9	Which kind of cases do you treat with aligners.	non-extraction cases with mild cases (33%)	extraction cases with severe discrepancy	Extraction cases.	All (66%)
10	What is your opinion about in-home digital scanning for aligners	support it (51.20%)	against it (48.80%)		
11	What type of digital records do you provide to aligner companies for fabrication of aligners	intra-oral optical scanners (32.90%)	Transferring of PVS Impression (8.50%)	Impression model and Lab scanning (58.50%)	
12	Are you satisfied with the treatment outcome of aligners	yes (90.20%)	no (9.80%)		
13	On a scale of 1-10 how satisfied are you with the treatment outcome of aligners	1 to 4 (7.30%)	5 to 6 (16%)	7 to 8 (49.40%)	9 to 10 (27.10%)
14	Are you aware of the Indian Orthodontic Society (IOS) and its guidelines	yes (64.60%)	no (35.40%)		

## DISCUSSION

Aligners have been introduced in dentistry as an aesthetic technique to align teeth. However, the reliability on aligners for correction of various kinds of malocclusion and its treatment outcome has been controversial among Orthodontists and General Dentists.

Although most of the Orthodontists have started using aligners as a treatment option mainly in adults, but the percentage of patients treated with Aligners is still less than 10% of the total orthodontic treatment. The group of Orthodontists not practicing Aligners gave the reason for their reluctance to use aligners as its high cost, dependency on patient compliance, the results not being up to mark and their lack of required training.

The results of the survey suggests that the kind of

cases been treated with Aligners were mostly non-extraction cases with mild discrepancy. Very few Orthodontists considered treating extraction cases and non-extraction cases with severe discrepancy with the aligners. This supports earlier research by d'Apuzzo et al.<sup>1</sup> that demonstrated a higher proportion of participating general dentists and orthodontists were more comfortable treating malocclusion with mild-to-moderate crowding and class I dental relationships than other malocclusions.<sup>3,4</sup>

In the present survey most Orthodontists found periodontal health to be better in aligners as compared to conventional orthodontics. This pattern is consistent with earlier research, Rossini et al. concluded that the periodontal health indexes were significantly improved in aligner treatment when compared to fixed orthodontic

treatment.<sup>5</sup> Gastel et al. and Talic asserted that the primary risk factor for periodontal illnesses following orthodontic treatment is plaque retention around the fixed brackets and that orthodontic treatment itself is not the cause of the rise in periodontal pathologies.<sup>6</sup>

Regarding the time duration with aligners as compared to conventional orthodontics, mixed options were found. 34.5% of Orthodontists observed decrease in time duration, 27.3% with increase time duration and 38% Orthodontists stated no drift in time duration. Bushang et al.<sup>4</sup> in his study compared the time efficiency of aligner therapy and conventional fixed ortho treatment and stated that the Invisalign® group's total treatment time was determined to be 67% shorter in non-extraction cases. The absence of the finishing and detailing phase, which can take up to 6 months with fixed appliances, was cited as evidence for the short treatment time with aligners. On the other hand, Invisalign® treatment time in extraction situations was 44% longer than it is for fixed-appliance treatment.<sup>7</sup>

The popularity of aligners has increased among General Dentists, especially for adult subjects, though major orthodontic treatment still being done by conventional orthodontics. Majority of the general dentist (85.5%) have orthodontic treatment facilities in their clinic being done by visiting orthodontists whereas 20.5% perform orthodontic treatment on their own. d'Apuzzo et al. in their study found that Orthodontists learned about clear aligners mostly during academic seminars, congress lectures and papers or books in comparison to General Dentists who mostly learned about aligners from private courses.<sup>3</sup>

Regarding the record preparation, among the different methods such as intraoral optical scanners, PVS impression, impression model and lab scanning, most of the orthodontists were found to be using intra-optical scanners.<sup>8</sup> Although, general dentists were aware of scanners but very few percent of dentists used it with most of them opting for impression models. Intra oral scanner have been proved to be better than other methods in terms of accuracy and fit in many studies and Inter- and intra-arch measurements from digital models produced from intraoral scans appeared to be reliable and accurate in comparison to those from conventional impressions<sup>9,10</sup> suggesting that orthodontists employ the best available armamentarium.

More than 50% of General Dentists were found to support

in-home digital aligners oblivious to the negative effects that could arise and the harmful consequences that could result as it lacks the involvement of expertise.<sup>11</sup>

For accessing the treatment outcome obtained by aligners therapy, 1-10 rating scale was given to participants. 83.7% orthodontists and 63 % of general dentist rated the treatment outcome with aligners to be 5 to 8, which was quite satisfactory, with 75% of orthodontists feeling the need to switch to other orthodontic appliances for getting the desired results. This can be because of the ineffectiveness of aligners in treating a wide range of discrepancies with need of complex biomechanics at times.<sup>12,13</sup> The treatment outcome of general dentists was low in comparison to Orthodontists possibly as a result of lack of in-depth knowledge of selection of cases by General dentist. Hence success of any treatment modality in effective outcome is related to specialisation in that field. As Orthodontists are trained to understand simple to complex malocclusion and can request appropriate changes in treatment plans provided by the companies hence are better suited for aligner therapy for correcting Malocclusion.

## CONCLUSION

While both groups acknowledge the potential of aligners, particularly for improved hygiene and potentially faster treatment times (non-extraction cases for orthodontists), their use remains limited. Orthodontists primarily utilize aligners in mild, non-extraction cases due to concerns about cost, patient compliance, and treatment effectiveness for complex malocclusions. Conversely, general dentists, though increasingly interested in aligners, often lack the in-depth biomechanics knowledge crucial for successful treatment.

## LIMITATION

This study may be affected by response bias, as orthodontists and general dentists might have professional biases that influence their answers. Additionally, the self-reported nature of the questionnaire could lead to inaccuracies, as respondents might give socially desirable answers rather than their true opinions.



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