



Assessment of Knowledge, Attitude, And Practice regarding Clear Aligners among dental practitioners: A Cross-sectional survey- based study.

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ABSTRACT:

Background: In recent era, many adults have started seeking orthodontic treatment and most of them prefer an aesthetic approach and aligners is a recent alternative. Despite its effectiveness in treating various malocclusions, the awareness and knowledge regarding its efficiency among dental practitioners is yet to be studied.

Aim: To assess the level of knowledge and perception regarding clear aligners and its practice among dental practitioners in various parts of Tamil Nadu.

Materials and Methods: A cross-sectional survey was conducted among 100 dental practitioners from various parts of Tamil Nadu, chosen based on the selection criteria. A unique well-structured self-administered questionnaire was sent through different social media platforms to all participants. Informed consent was obtained priorly. The questionnaire comprised of 23 questions categorized under three major headings: (a) sociodemographic details; (b) knowledge and attitude-based; and (c) practice-based questions regarding aligners.

Statistical Analysis: Descriptive analysis (relative frequency distribution) using SPSS version 16.0 software.

Results: The gender distribution was 51% males and 49% females. The majority of participants showed significant knowledge and awareness about aligners and significant positive responses were seen towards their clinical efficiency. Almost 60% of participants were using aligners in their practice and the frequency rate was minimum of 1 to 10 aligner cases per annum.

Conclusion: Within the constraints of the study, an improved knowledge regarding clear aligners was noticed among dental practitioners. Based on their responses, clear aligners can be considered as one of the most evolving treatment modalities and a clinician-friendly approach, despite their cost-effectiveness.

Keywords: Cross-sectional study, Clear Aligner Appliance, Dental Specialty, and Questionnaires and Surveys.

I. INTRODUCTION:

Orthodontic treatment was analogous to the less aesthetic appearance because of the metallic arch wires and brackets and the patients perceiving it showed reduced intellect and low self-esteem. ¹Various aesthetic approach have evolved through the years to rectify the above difficulty and one such is the advent of Clear aligners (CA) by Dr. Harold Kesling in 1946, he introduced the use of a series of thermoplastic tooth positioners to obtain tooth alignment. It was more of time-consuming process that required manually repositioning of teeth which should be reset in wax, and following it a clear vacuum-formed retainer was made for every tooth movement in a series of stages until the teeth were aligned & was capable of minor tooth alignment. ²Over the years, Clear aligner has become an increasing alternative over conventional braces as they are more transparent, less irritating and easy to maintain the oral hygiene. ³The advent of clear aligner technology does not mean that 150 years of orthodontic principles are no longer valid. However, in this 21st century of the digital era, the clinician must learn to apply those principles of orthodontics to the field of clear aligner technique.

Over the decade, aligner treatment has evolved through new technologies and materials to expand the range of tooth movements. ⁴Advantages like improved aesthetics and increased patient compliance and better quality of life are seen with aligner therapy. ⁵Significant differences were evident in aligner therapy between the orthodontist and general dental practitioner in their clinical practice. ⁶Despite their benefits in terms of patient comfort and acceptability, oral hygiene maintenance & esthetics, there are still significant debate regarding the efficiency of clear aligners, and a wide concordance on their clinical efficiency has not yet reached the literature.



The previous survey just compared the orthodontists' view about aligners with dental practitioners⁷ and certain other surveys compared their efficiency with conventional fixed appliances.⁸ Accordingly, no studies directly surveyed the perception and knowledge of aligners among dental practitioners as per literature search. Therefore, the present survey aimed to assess the knowledge, attitude, and practice regarding clear aligners among different dental practitioners in various parts of Tamil Nadu. The secondary objectives of the study were to analyse the reasons behind their choice and neglect towards clear aligners & to find out the frequency of clear aligner usage among general dentists based on their clinical experience.

II. MATERIALS AND METHODS:

A cross-sectional survey was conducted among dental practitioners from various parts of Tamil Nadu. Ethical clearance and approval were obtained from Institutional Review Board and Ethical Committee (IEC ref. no.: 395/KSRIDSR/IEC/ 2023) before starting the study. Considering the population size as 500, with a confidence level of 95% and confidence limit of 10%, the sample size calculation done using OpenEpi, Version 3 (Open-Source Epidemiologic Statistics for Public Health) software was estimated to be 81 participants. Therefore, considering the dropouts and to eliminate bias, 100 dental practitioners were selected based on convenience sampling method. All respondents of the survey signed a declaration regarding the informed consent prioly.

A unique well-structured self-administered questionnaire was set, which comprised of 23 questions categorized under three major headings: (a) sociodemographic details; (b) knowledge and attitude regarding aligners; and (c) practice-based questions regarding aligners. Out of 23 questions 20 had multiple choices (Yes/No/Don't Know) so that it would be convenient for the respondents to choose one from it and rest 3 questions were open ended to exactly find out their opinion regarding aligners. Two experienced orthodontists tested the validity of the survey (using kappa statistics) and later it was piloted with five dental practitioners to test the clarity of the survey questions. The research purpose, survey-filling duration, data management, and the researcher's contact details were outlined on the first page of the survey.

Dental practitioners of any specialty with more than a year of clinical practice were selected for the study. The dentists without private practice, non-authorized dental practitioners, and orthodontists were excluded from the study. An IP

blocking feature was enabled to ensure that each participant was allowed to fill out the survey form only once. The questionnaire was sent through different social media platforms. The data from all respondents were collected and cross verified for any logical inconsistency and any skipped or missed out questions to ensure the elimination of incomplete survey forms. After which the data were decoded and blinded while entering them in the Microsoft Excel sheet to eliminate the bias. Then using SPSS version 16.0 software the data assessment was carried out using descriptive statistical analysis like relative frequency distribution. Frequency polygons and bar diagrams were used to depict the responses for each question and also the demographic data.

III. RESULTS:

Totally, 100 completed surveys were obtained, out of which 5 responses were excluded as they were found to be filled by non-authorized dental practitioners. Out of 95 responses, gender was equally distributed (51% males and 49% females) with the majority being general dentists compared to the specialists & demographic data being tabulated (Table1). Next to general dentists, the second majority of participants were Endodontists with the least frequency of participation from oral surgeons and public health dentists (Table1). Also, dental practice experience was collected, of which majority fall under the category of 1 to 5 years of clinical practice.

Responses to questions based on knowledge and attitude about CA (Table 2) revealed that most of the dental practitioners showed more positive responses towards oral hygiene maintenance with aligners (96.8%), aligners being a more aesthetic alternative to conventional braces (97.9%), social media was instilling a positive attitude towards CA (91.6%) and also patients reporting to them were aware of CA treatment (63.2%) and their acceptance rate was also more with CA (62.1%). According to the participants of the study, severe malocclusions were difficult to treat with CA (61.1%) and were not much of a cost-worthy technique (48.4%). The majority of the participants were not aware of the relapse tendency after CA treatment (36.8%).

Responses to questions based on practice about aligners (Table 3) revealed that out of 95 participants, almost 57 (60%) were using CA in their clinical practice, and in which majority (93%) were seeking an orthodontist opinion before proceeding with CA treatment. Based on their practicing experience, the respondents have stated that oral hygiene maintenance was better with CA



(91.2%) and patients had experienced less pain during the initial wear compared to regular braces (78.9%) and recall visits were reduced with CA (73.7%) and post-treatment results were better than regular braces (45.6%). The participants also responded that treatment duration was not less with CA compared to regular braces (42.1%).

The reason for the practitioners' choice and neglect towards CA was depicted in Graphs 2a & 2b. The majority stated that cost effectiveness, lack of knowledge, longer treatment duration compared to regular braces and its limitation in treating severe malocclusions were the reasons for their neglect towards CA therapy. The reasons behind their choice towards CA were being more aesthetic in appearance, more patient compliance, better oral hygiene maintenance, lesser chairside time, and more profitable for clinicians. Out of these, lack of knowledge and aesthetic appearance were two main reasons for the practitioners' neglect and choice towards CA respectively. From the results of the study, out of practicing dentist's involved in the study majority (94.7%) were treating approximately 1- 10 patients per year with aligners. (Graph 1)

IV. DISCUSSION:

The aesthetic demand of the adult patients seeking orthodontic treatment have started increasing over recent times and Clear aligner has now been an alternative to regular conventional braces, because of its transparency, better acceptability by patients and less irritation to the soft tissues.³ Presently CA usage has become a vogue, with increased social media advertisements that are promoting it and thereby gathering public attention. This study assessed the dental practitioners' knowledge regarding CA treatment & found that around three-fourths of the participants were familiar with aligners.

According to systematic reviews by Papadimitriou et al and various other authors⁹⁻¹¹, the present evidence-based research suggests that even though CA is a more acceptable treatment option for mild- to moderate- malocclusions, conventional braces remain the ideal standard treatment choice in orthodontics & this is in accordance with the results of our study where majority responded that severe malocclusions were difficult to be treated with CA.

According to research by Alpaydın MT et al and several authors¹²⁻¹⁵, online information about CA is basically not adequate, but in our study, the respondents reported that social media instills a positive attitude about aligners among the

general public and also provides adequate information about CA.

According to the study by Alansari R et al¹⁶, the majority of adults stated that CA is aesthetically more pleasing than conventional braces, which is in accordance with the findings of our study.

One of the advertised benefits of using CA was better oral hygiene maintenance since it could be removed and inserted easily by patients on their own and are self-cleansable. Although the existing literature^{11,17} supports this statement, extensive evidence-based support is still lacking. The results of our study also revealed that oral hygiene maintenance was better with aligners.

According to a randomized clinical trial by Lin E et al¹⁸, the treatment duration for correction of minor malocclusion was quite increased by 4.8 months when treated using aligners compared to conventional braces and more than half of the participants' responses of the present survey were in accordance with it.

Previous studies by Nabeel Almotairy et al¹⁹ and Cardoso PC²⁰ et al stated that compared to conventional braces treatment, the discomfort experienced by patients during the initial days was reduced in CA treatment and this was related to responses of this present study.

Clinical Significance:

This cross-sectional questionnaire survey helped us to assess the dental practitioner's awareness regarding clear aligners. They are considered essential, especially in developing South Indian populations because information regarding newer treatment procedures is still lacking among dental practitioners. Therefore, appropriate and adequate information regarding clear aligners can be provided to dental practitioners based on their existing knowledge, thereby enhancing the treatment outcome with clear aligners. This builds confidence among non-specialty dental practitioners in treating patients with CA therapy.

V. LIMITATIONS:

It was very common to conduct public surveys⁽⁷⁾ and this cross-sectional survey assessed the awareness, knowledge, and practice about CA among dental practitioners. Since, we had gone for convenience sampling and also the link was shared via social media platform, equal distribution of study population was not achieved. Moreover, the majority of the respondents were initial practitioners with less than 5 years of clinical practice and this could be the reason for a smaller number of aligner usage among the participants.



Hence, interviewer-based surveys with equal distribution of population and with a greater number of experienced participants are needed in the future.

VI. CONCLUSION:

Within the constraints of the study, an overall increased-awareness about Clear aligners was seen among dental practitioners. The knowledge and attitude regarding CA were moreover similar among practitioners, both using and not using it in their clinical practice. Based on their responses, clear aligners can be considered one of the most evolving treatment modalities and a clinician-friendly approach, despite their cost effectiveness.

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Tables & Graphs:

Table 1: Demographic Data of Research Participants (n=95)

S.no	Questions	Options	Total no. of responses	Responses in Percentage
1)	Gender	• Male	47	49.5%
		• Female	48	50.5%
2)	Specialty	• General Dentist	52	54.7%
		• Oral medicine and Radiologist	8	8.4%
		• Endodontist	15	15.4%
		• Prosthodontist	4	4.2%
		• Periodontist	7	7.4%
		• Pedodontist	4	4.2%
		• Oral Pathologist	3	3.2%
		• Oral & Maxillofacial Surgeon	1	1.1%
• Public health dentist	1	1.1%		
3)	Dental practice experience	• 1 to 5 years	80	84.2%
		• 6 to 10 years	7	7.4%
		• > 10 years	8	8.4%



Table 2 :Participants' Knowledge & Attitude about Clear Aligners

S.No.	Questions	Total No. of Responses as per options (in percentage)		
		Yes	No	Don't Know
1)	Severe malocclusions can be treated using aligners.	28(29.5%)	58(61.1%)	9(9.5%)
2)	Aligners are technique-sensitive when compared to regular braces.	49(51.6%)	40(42.1%)	6(6.3%)
3)	Maintaining oral hygiene with aligners is easier compared to regular braces.	92(96.8%)	3(3.2%)	0(0%)
4)	Aligners are aesthetic for patients compared to regular braces.	93(97.9%)	1(1.1%)	1(1.1%)
5)	Aligners are cost-worthy technique compared to regular braces.	44(46.3%)	46(48.4%)	5(5.3%)
6)	Relapse tendency will be comparatively less in case of aligners.	29(30.5%)	31(32.6%)	35(36.8%)
7)	Social media is instilling a positive attitude about aligners among public.	87(91.6%)	2(2.1%)	6(6.3%)
8)	Patients reporting to you for treatment are aware about aligner treatment.	60(63.2%)	29(30.5%)	6(6.3%)
9)	Patient acceptance is more towards aligners than regular braces nowadays.	59(62.1%)	27(28.4%)	9(9.5%)



Table 3: Participants' Practice based aspect about Clear Aligners

S.No.	Questions	Total No. of Responses as per options (in percentage)		
		Yes	No	Don't Know
1)	Maintaining oral hygiene was difficult for patients with aligners.	1(1.8%)	52(91.2%)	4(7%)
2)	Patients do not have difficulty in performing their daily routine with aligners.	43(75.4%)	10(17.5%)	4(7%)
3)	Patients pain experience was less with aligners compared to regular braces.	45(78.9%)	5(8.8%)	7(12.3%)
4)	Treatment duration was less in aligners when compared to regular braces.	21(36.8%)	24(42.1%)	12(21.1%)
5)	Recall visits were less for aligners than regular braces.	42(73.7%)	7(12.3%)	8(14%)
6)	Post-treatment results were better with aligners compared to regular braces.	26(45.6%)	10(17.5%)	21(36.8%)



