

Perception about Clear Aligner Therapy among Patients Seeking Orthodontic Treatment in Public Tertiary Care Dental Hospital-Cross-Sectional Survey

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Abstract:-

➤ Aim:

Aim of the study is to assess perception about clear aligner therapy among patients seeking orthodontic treatment in public tertiary care dental hospital.

➤ Material and Methods:

This cross-sectional survey was conducted using a questionnaire that had been framed and tested for reliability and validity. It was used to collect information on the socio-demographic profile and the perspectives of orthodontic patients regarding Clear Aligner Therapy. Participants had been informed about the study, and only those who had consented were administered the questionnaire. The structured questionnaire consisted of 23 closed-ended questions, and the data was collected using Google Forms.

➤ Results:

Data from 294 patients were assessed, comprising 159 females (54.1%) and 134 males (45.6%), all between the ages of 15 and 45. Of these, 92% were aware of Clear Aligner Therapy (CAT). 31.3% patients perceived CAT to be less effective than fixed appliance (FA) therapy, with only 19.3% being aware of the cost of CAT. Additionally, 30.4% believed that CAT would result in a longer treatment duration compared to fixed appliances. However, 59.6% preferred CAT over fixed appliances for aesthetic reasons, and 78.6% favored CAT for better oral hygiene maintenance.

➤ Conclusion:

As Clear Aligner Therapy (CAT) represents one of the latest advancements in orthodontics, there is a pressing need to increase education and awareness among the general population to improve their understanding of this treatment option.

Keywords:- Clear Aligner, CAT Therapy, Fixed Appliance, Perception, Translucent Removable.

I. INTRODUCTION

Esthetics, function, and stability are the primary goals in orthodontic treatment. With the rising demand for esthetic solutions, clear aligners have emerged as a significant advancement in orthodontics. They offer distinct advantages over traditional fixed appliances, particularly in terms of appearance, as they are more aesthetically pleasing and can be removed during socially sensitive situations(1-4). Additionally, clear aligners do not impose food restrictions, a common drawback of fixed appliances. From the operator's perspective, aligner therapy requires less chairside time and fewer patient visits, allowing orthodontists to manage a higher patient load more efficiently(5,6).

However, the custom design and fabrication of clear aligners involve advanced technology (such as 3D imaging and printing), can make them more expensive than traditional braces(3). Since clear aligners are removable, their effectiveness depends heavily on patient compliance. Patients need to wear the aligners for 20-22 hours a day for them to work as intended, and failure to do so can prolong treatment time(7). Clear aligners are great for treating mild to moderate cases of crowding or spacing, but they may not be effective for severe malocclusions or cases requiring more complex tooth movements, such as large rotations or significant vertical changes(8).

Patients' knowledge and perception of different orthodontic appliances are often influenced by aesthetics. Studies show that many patients, especially adults, prioritize the visual aspect of treatment when choosing an orthodontic option(9). Orthodontic aligners have become one of the most popular options requested by patients.

In 1946, Dr. H.D. Kesling introduced a revolutionary concept in orthodontics: the use of sequential thermoplastic tooth positioners to gradually move misaligned teeth into better positions. This idea laid the groundwork for what we now recognize as clear aligner therapy(10). In 1959, Dr. Antony Nahoum expanded on Kesling's foundational idea of sequential tooth movement by introducing the first documented clear thermoplastic appliance. Nahoum's appliance was vacuum-formed, allowing it to firmly adapt to the patient's dental cast. (11).

Later in the year 1970, Dr. Richard Ponitz introduced the concept of the "invisible retainer, which was designed primarily for retention purposes(12). In 1985, Dr. James A. McNamara built on the work of Ponitz by modifying the vacuum-forming technique used to create the "invisible retainer." McNamara introduced the use of a Biostar machine, which utilized positive air pressure to fabricate the retainers. He used a 1 mm thick Biocryl sheet, a durable and transparent material, to create retainers that were both clear and effective for final detailing and retention(13). In 1993, Sheridan further modified it by reducing the thickness to 0.030 and introduced the "Essix appliance"(11). In 1997, two Stanford graduates, Zia Chishti and Kelsey Wirth, along with two orthodontists, founded Align Technology (Santa Clara, CA, USA).

With the raising esthetic demands clear aligner therapy, it is important to assess the knowledge and perceptions of the general population regarding this treatment. Educating patients is essential, as it helps orthodontists provide more effective care and ensures better treatment outcomes. Therefore, the aim of the present study is to assess the perceptions of patients seeking orthodontic treatment at a public tertiary care dental hospital regarding clear aligner therapy.

II. MATERIALS & METHODS

➤ *Study Design:*

Cross-sectional survey to assess perception about clear aligner therapy among patients seeking orthodontic treatment in public tertiary care dental hospital.

➤ *Study Center:*

- Department of Orthodontics and Dentofacial Orthopaedics,
- Tamil Nadu Government Dental College and Hospital, Chennai – 600 003.

➤ *Study Duration:*

- Six months.

➤ *Ethical Clearance:*

- Ethical approval was given by Tamil Nadu Government Dental College and Hospital,
- Chennai – 600 003 with IERB Reference No: 57/III/IERB/2024/TNGDCH.

➤ *Study Sample:*

The sample size for the study was calculated to be 284, with a 95% confidence level. However, to account for potential dropouts or exclusions, a total of 304 patients were initially recruited. Of these, 294 participants met the inclusion criteria and were ultimately included in the study.

➤ *Inclusion Criteria:*

- Patients willing to participate
- Patients in age group 12-45 years

➤ *Exclusion Criteria:*

- Participants who are not giving informed consent
- Patients who have systemic illness, mentally retarded and unable to answer a questionnaire.

➤ *Methodology:*

This study is designed as a cross-sectional survey. A structured questionnaire will be developed, rigorously tested for reliability and validity, and used to gather information about the socio-demographic profile and perspectives of orthodontic patients regarding Clear Aligner Therapy (CAT). Before administering the questionnaire, participants will be informed about the study's purpose, and only those willing to participate will be included. The structured questionnaire consisted of 23 closed-ended questions, and the data was collected using Google Forms.

III. RESULTS

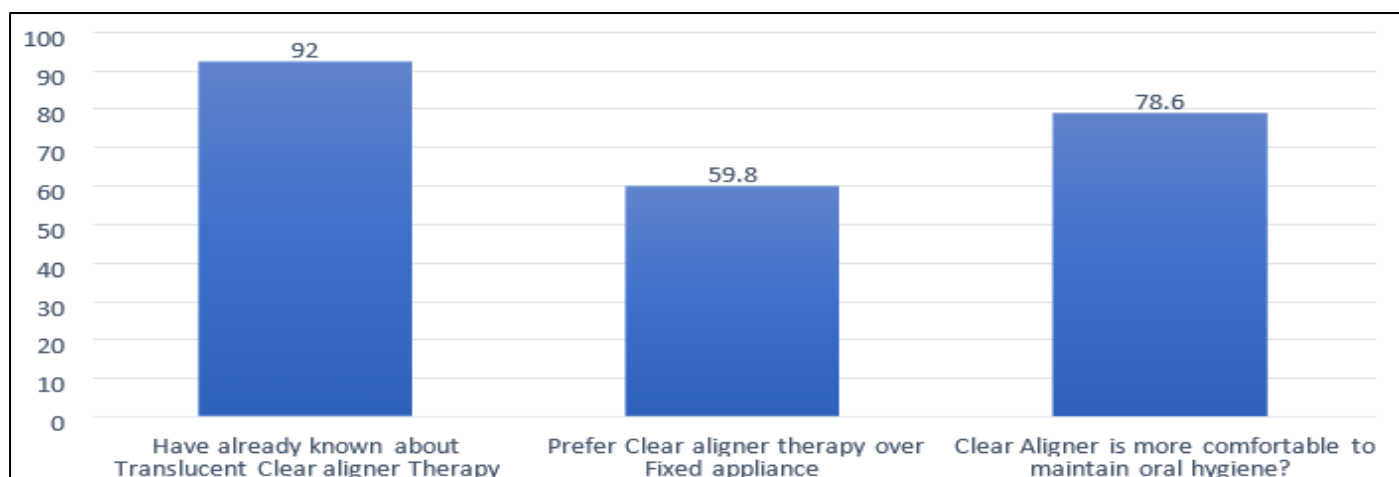


Fig 1 Responses to Questions on Clear Aligner Therapy (% of Patients)

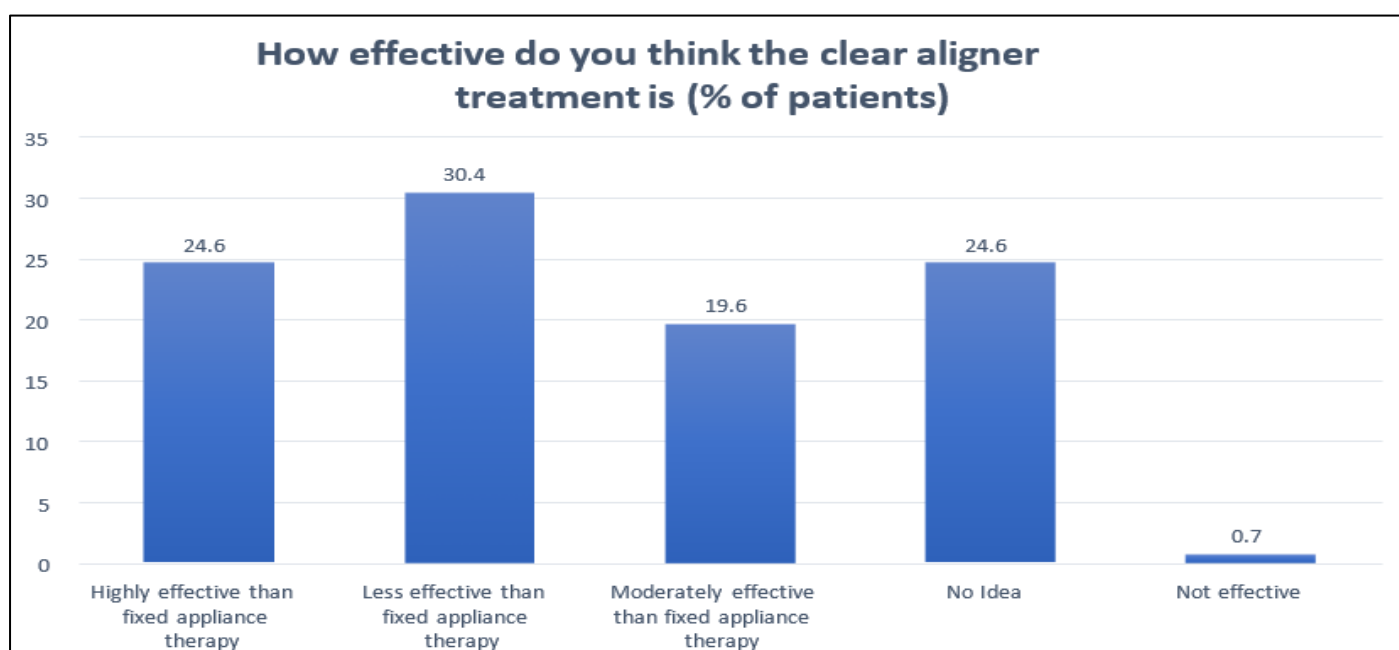


Fig 2 Patient Perception on the Efficiency of CAT

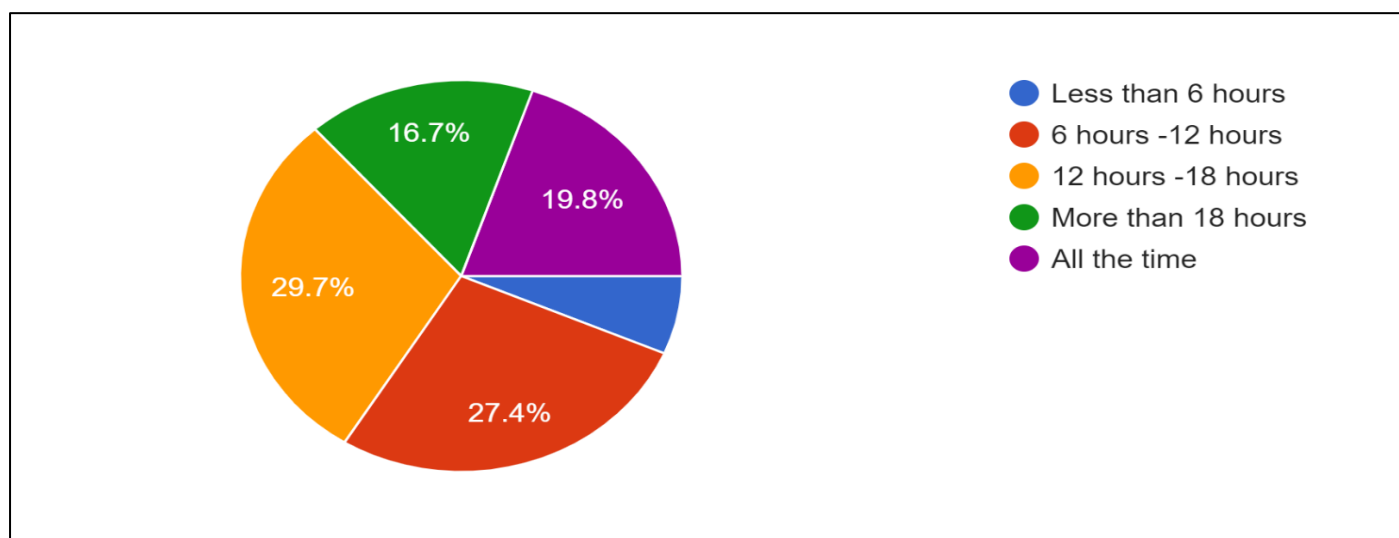


Fig 3 How many Hours should you Wear a Clear Aligner in a Day?

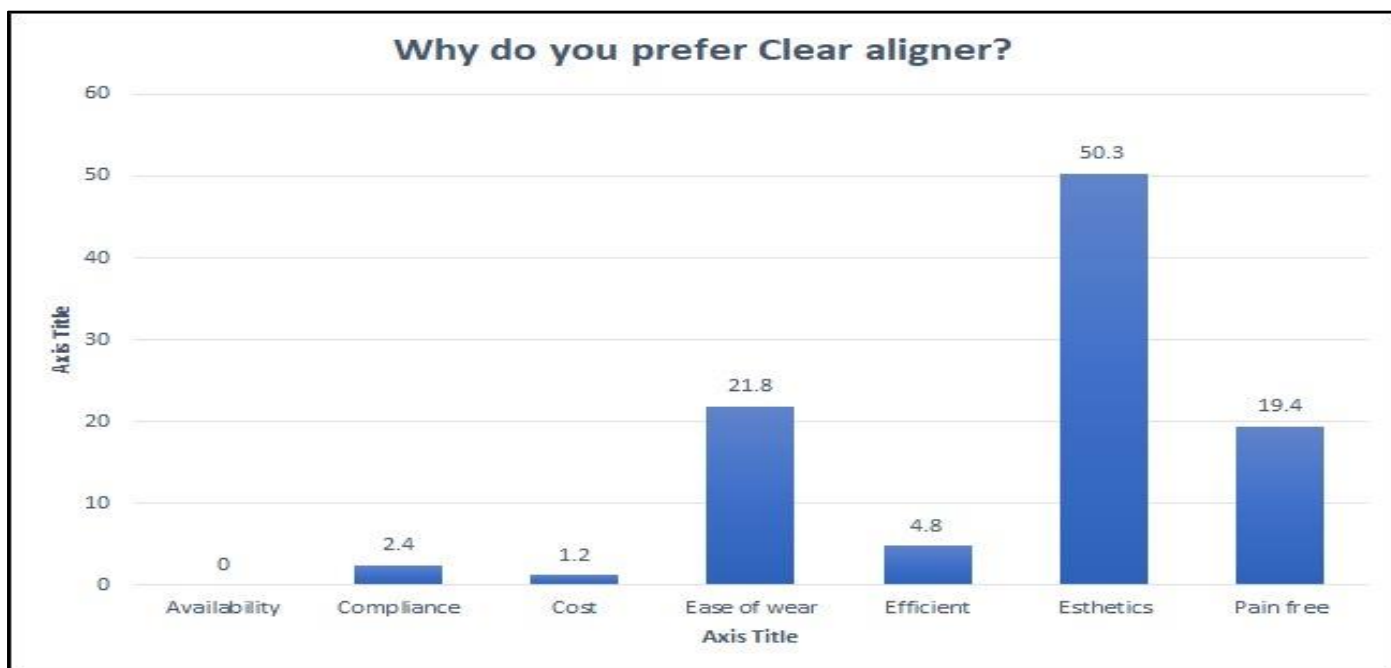


Fig 4 Bar Chart showing the Preference of CAT Therapy

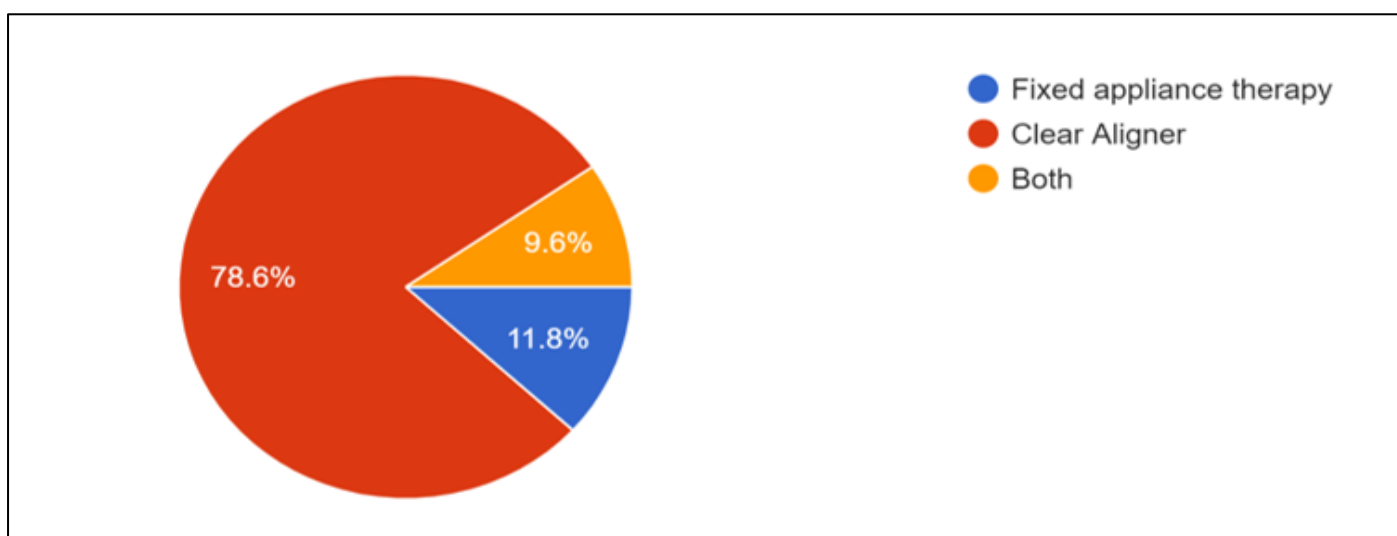


Fig 5 Which Appliance is more Comfortable to Maintain Oral Hygiene?

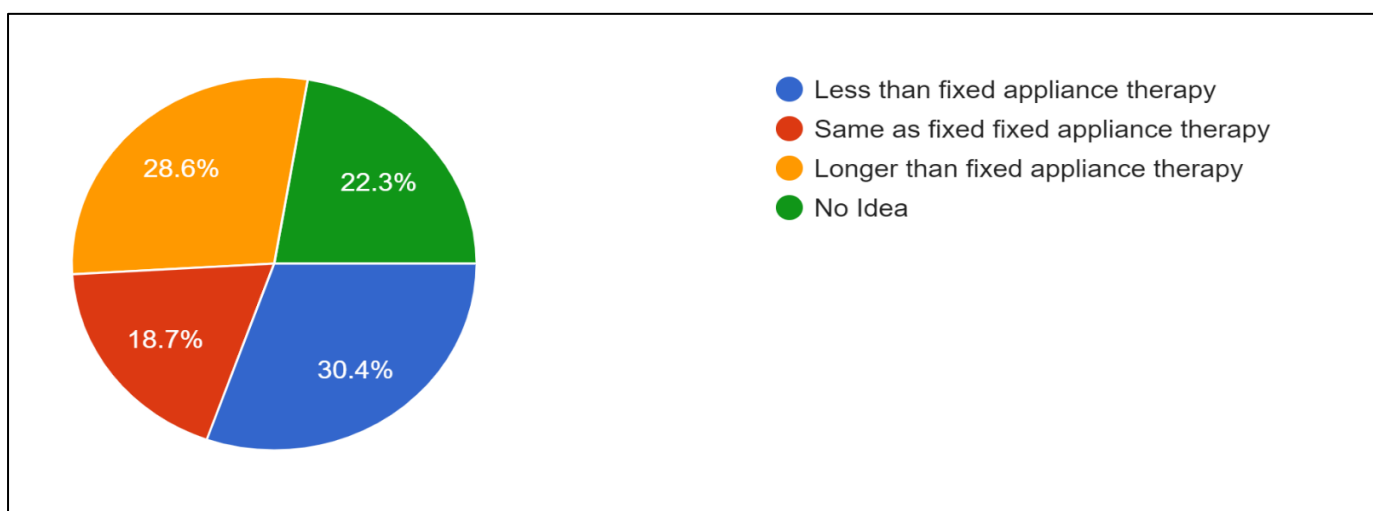


Fig 6 What according to you is the total time duration of clear aligner treatment

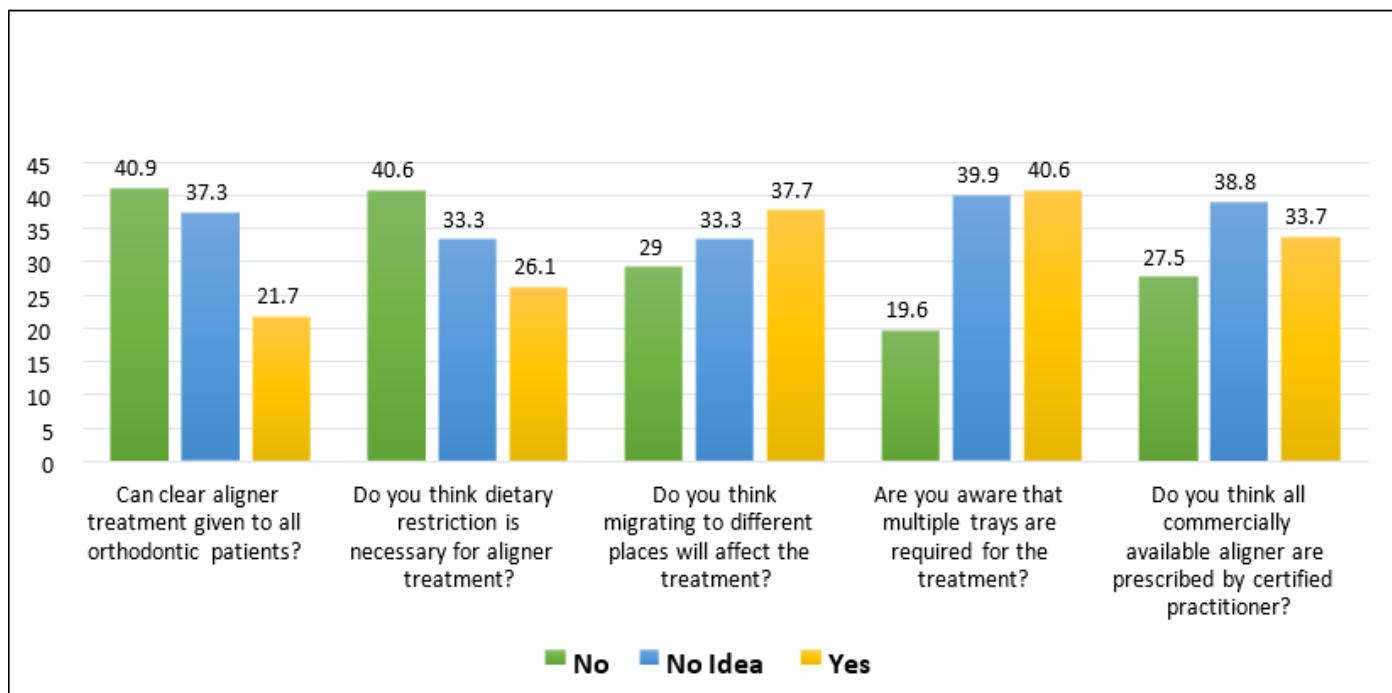


Fig 7 Bar chart showing the various responses to questions on Clear Aligner therapy

IV. DISCUSSION

Patients are increasingly seeking not only the perfect smile as the outcome of their treatment but also a more aesthetically pleasing and comfortable experience during the process. To meet this demand, innovative solutions like orthodontic aligners have been introduced, offering a subtle and effective alternative to traditional braces(14).

The current study found that 87% of respondents were already aware of aligner treatments, highlighting their growing popularity. This increase in awareness can largely be attributed to marketing strategies that target patients directly through various media, including magazines, television, and the Internet(15). Notably, 43.5% of respondents in this study reported learning about clear aligners through social media, while 21% became aware through commercials. Furthermore, the study revealed that the majority of participants who were aware of aligners were young, aged between 18 and 29 - a demographic often targeted by advertising campaigns. When it came to aligners, women demonstrated greater awareness than men. Women are often more self-conscious about their appearance when looking in the mirror and may feel awkward about their smile, making them more likely to seek aesthetic dental solutions(16).

In terms of efficiency, previous studies have shown that aligners may be less effective than fixed appliances for certain types of orthodontic treatments(17,18). In this study, 31% of participants perceived clear aligner therapy (CAT) to be less effective than fixed appliance therapy. However recent advancements in materials and biomechanical techniques in aligner therapy have led to increased efficiency, making aligners a more effective option in orthodontic treatment(17,19,20). Recent study shows that, clear aligners can produce clinically acceptable outcomes that are

comparable to fixed appliance therapy, particularly in the buccolingual inclination of the upper and lower incisors in cases of mild to moderate malocclusions(21).

When it comes to treatment duration, 30% of people believe that clear aligner therapy will take longer than fixed appliance therapy. However, there is some controversy surrounding aligner therapy. While some believe that clear aligners take longer than fixed appliances to achieve results(22), others favor aligners for their perceived efficiency and convenience(23).

Recent systematic review shows that there was no statistically significant difference in the treatment duration between the CAT and FA groups in mild to moderate crowding cases (24).

Moreover, the majority of participants(50.3%)found clear aligners to be more aesthetically pleasing than traditional braces, a result consistent with findings from other studies.(25,26). One of the key advantages promoted for clear aligners is the ease of maintaining oral hygiene, as they are removable appliances. In this study, 78.6% of patients also expressed a preference for this feature. Most participants in this study were unaware of the cost of clear aligner treatment.

Most participants in this study were unaware of the cost of aligner treatment, and many did not know that multiple trays are used throughout the treatment or the required duration for wearing the aligners. Most of the patients who participated in this study were between the ages of 18 and 29 and came from a middle-class socioeconomic background. Despite the cost, many participants preferred aligners for aesthetic reasons. As a result, aligners are gaining popularity, particularly among the younger population.

V. LIMITATIONS

It is a cross-sectional study design, which does not establish a time-based relationship between exposure and outcomes. Additionally, the study faced geographical restrictions. Future research could benefit from a larger sample size and a more diverse ethnic representation, potentially leading to increased awareness and improved results. Another potential limitation is the self-reported nature of the data, which could be subject to response biases or social desirability biases.

VI. CONCLUSION

The level of knowledge and awareness regarding clear aligner therapy among patients is notably low, with much of their understanding limited to influences from social media. This narrow perspective highlights a significant gap in patient education. It is therefore imperative for orthodontists to take on the responsibility of informing each patient about the various treatment options available for addressing their specific malocclusions. By providing comprehensive information and fostering an ethical environment, orthodontists can empower patients to make informed, autonomous decisions about their dental care, ultimately leading to better treatment outcomes and patient satisfaction.

➤ Declaration of Patient Consent:

Informed consent was obtained from all participants prior to the study.

➤ Financial Support and Sponsorship:

Nil.

➤ Conflicts of interest:

Nil.

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