



Patients Preference to Clear Aligner Therapy Over Conventional Orthodontic Therapy

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ABSTRACT



Malocclusion is defined as irregularity of the teeth or a mal-relationship of the dental arches beyond the range of what is accepted as normal occlusion. Maloccluded teeth can cause psychological problems that are related to impaired dentofacial esthetics. Malocclusion may also cause serious problems related to oral health. This is a multifactorial defect caused by factors such as environment, lifestyle, health, genetics, socio-economic status etc. Clear aligners are orthodontic therapeutic options which are preferred for the correction of maloccluded teeth. The main aim of the study was to find out the awareness of the patients towards the preference of clear aligners as orthodontic treatment options. A University based setting was conducted. A sample size of hundred patients was taken for the survey. The survey was done by distributing an online questionnaire through Google forms consisting of 11 questions and circulated among the participants. The participants comprise both male and female patients. To eliminate bias, a randomized sampling method was used. The data was collected over a period of one week. All the 11 questions of the survey were close ended questions. Chi square test was applied to find the association between the parameters and the level of significance. This study shows the patients have a moderate understanding of clear aligners and their acceptance of it as an orthodontic treatment option.

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INTRODUCTION

India, known as the developing superpower in the upcoming times, has a population that ranks sec-

ond after China but the people of India are unaware of the various recent advancements in medicine and dental field (Mane *et al.*, 2018). Few people still stick to the taboo mindset saying old methodologies are effective in terms of treatment modalities (Kenealy *et al.*, 1989). Like other common dental problems such as dental caries, fluorosis, gingival and periodontal diseases, malocclusion is also considered the commonest complaint of every patient who visits a Government or a private dental practice (Kumar *et al.*, 2011). Malocclusion is defined as irregularity of the teeth or a mal relationship of the dental arches beyond the range of what is accepted as normal occlusion (Walther *et al.*, 1994). Malaligned teeth can cause psychological problems related to impaired dentofacial esthetics (Samantha, 2017). Malocclusion may also cause serious

problems related to oral health. This is a multifactorial defect caused by factors such as environment, lifestyle, health, genetics, socio-economic status etc (Robertson *et al.*, 2020).

Clear aligners are orthodontic therapeutic options which are preferred for the correction of malaligned teeth (Jain, 2019). Clear aligners are a solution for patients seeking a more discreet orthodontic treatment than conventional braces, as they do not use brackets or wires. Clear aligners are a modern and near-invisible method for correcting mild to moderate orthodontic problems (Singh, 2016). They align teeth just as braces do, but using a transparent, removable aligner. Taking orthodontic treatment as a corrective option is influenced by the desired self-esteem, attractive looks and self-perceptions (Balachandran *et al.*, 2019). Clear aligners are invisible orthodontic appliances that help in correction of teeth. They perform similar functions of that of a traditional fixed appliance but appear to be clear/invisible. They are used for correcting moderate discrepancies in occlusion and for patients who have a relapse in their treatment (Krishnan *et al.*, 2015). Clear aligners are not suitable for the treatment of severe malaligned teeth (Kamisetty, 2015). Optimum use for clear aligners is indicated to be worn for at least 22 hours for 2 weeks. The material used for clear aligners is polyethylene terephthalate glycol (PETG). This is a very clear, light in nature and resistant material making clear aligners durable to time, wear and tear, posing as an advantage in clear aligner therapy compared to that of conventional orthodontic therapy (Mahajan *et al.*, 1995). Treatment with clear aligners involves creating a virtual model of your teeth with a computer program to show you all of the steps involved, from the initial position of the teeth up to the final desired result. Lastly, oral hygiene is easy since you simply remove the aligner to brush your teeth and floss (Sivamurthy and Sundari, 2016).

Oral health knowledge is considered as an essential prerequisite for a healthy lifestyle (Viswanath *et al.*, 2015). The need and demand for orthodontic treatment varies based on social and cultural conditions (Rubika *et al.*, 2015). Though it is observed in many countries that patients prefer opting clear aligner therapy, the effectiveness of clear aligners are still doubted by patients compared to that of a traditional fixed orthodontic treatment. The primary objective of the study is to assess the knowledge and awareness of clear aligner therapy and their preference as a suitable orthodontic treatment modality among patients (Krishnan *et al.*, 2018).

MATERIALS AND METHODS

This study was conducted in a University setting. The study group for this research comprises patients undergoing orthodontic treatment in Saveetha Dental College and Hospital. The sample size of the study is 100 patients comprising both male and female participants. It was conducted as an online questionnaire survey uploaded in Google forms and circulated among the patients. To eliminate bias, a randomized sampling method was used (Jung, 2009). The data was collected over a period of one week. The survey consists of 11 close ended questions (Felicita *et al.*, 2012). The upside of this study is the presence of validated data has been already recorded. The downside of the study was that it was conducted in a specific area or region in Chennai, indicating geographic restrictions (Dinesh, 2013). Internal validity is done in the form of a pre tested questionnaire and external validity checking was done in the form of result replication in different time periods. All the data obtained were passed through the institutional ethics committee of Saveetha Dental College and Hospital, Chennai, India, for ethical reasoning.

Statistical analysis

Data was collected from Google forms and tabulated in Excel Sheet. The raw data was transferred to SPSS software after coding was done. Frequency distribution was used for definite variables. Chi square test was done to find the association between the required parameters and the level of significance (Jain, 2014).

RESULTS AND DISCUSSION



Figure 1: Frontal view of clear aligners in the upper and lower arch

A total of 100 patients were involved in this study. 55% were male participants, 39% were female participants and the remaining 6% didn't prefer to reveal their gender (Figure 2). Out of these 100

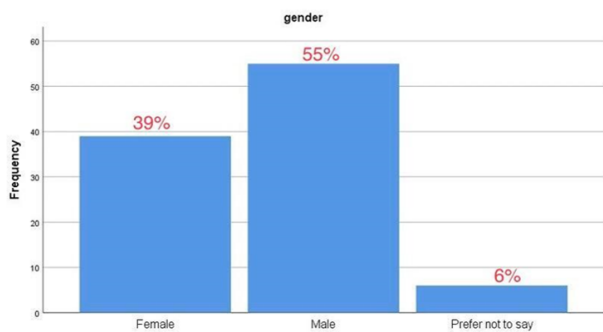


Figure 2: The frequency of distribution of gender population

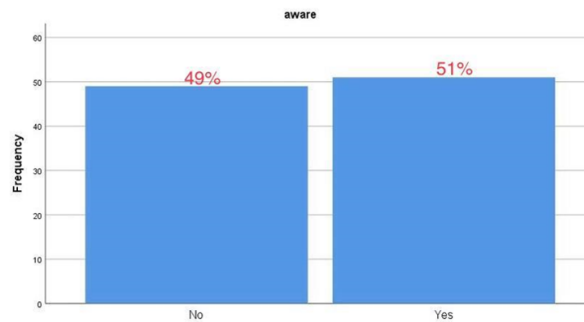


Figure 6: The frequency of response on distribution over awareness of the term "clear aligners"

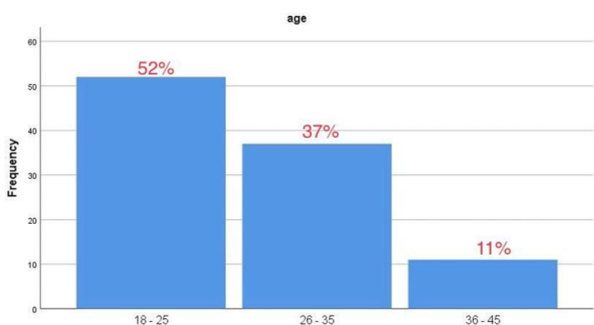


Figure 3: The frequency of distribution between age groups

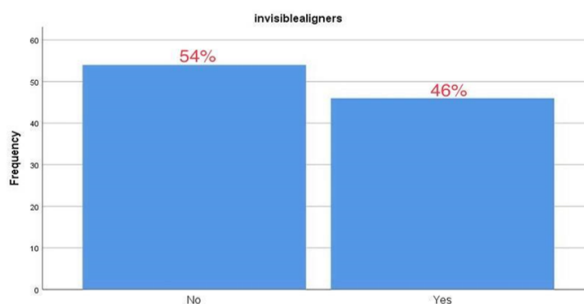


Figure 7: The frequency of response on the distribution of clear aligners as invisible therapy

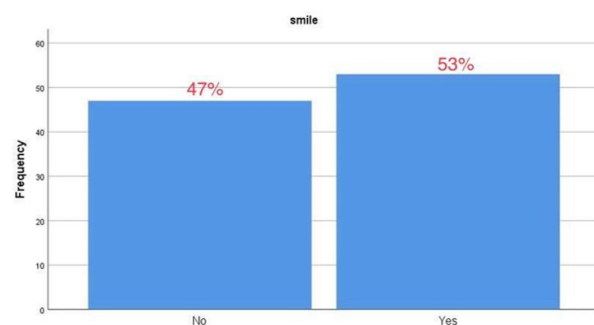


Figure 4: The frequency of responses on smile satisfaction among patients

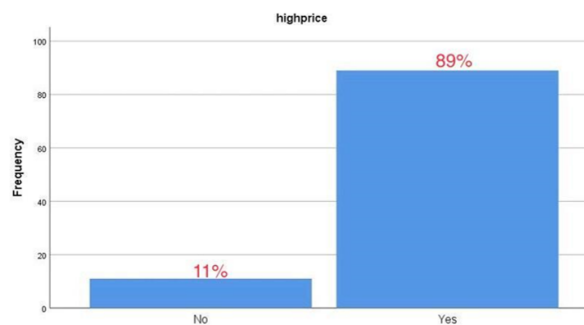


Figure 8: The frequency of response on the distribution of patients' concern over the high price of orthodontic treatment

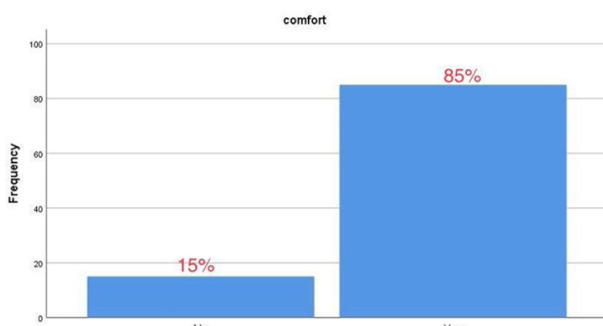


Figure 5: The frequency of response on patients preference over comfortable treatment option than conventional orthodontic treatment

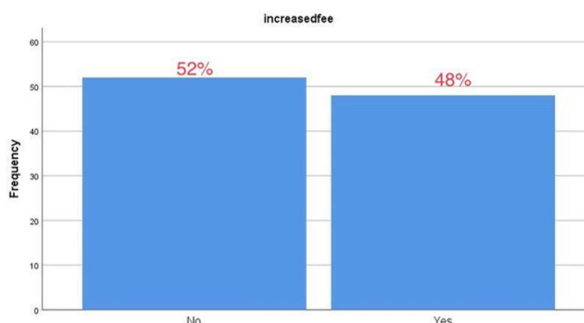


Figure 9: The frequency of response on the distribution of patients willingness to pay an increased fee for orthodontic treatment

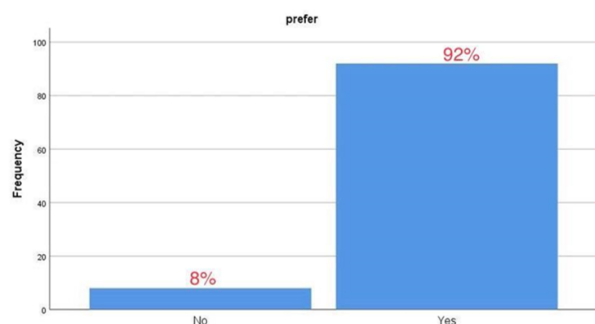


Figure 10: The frequency of response on distribution on the preference of clear aligner therapy

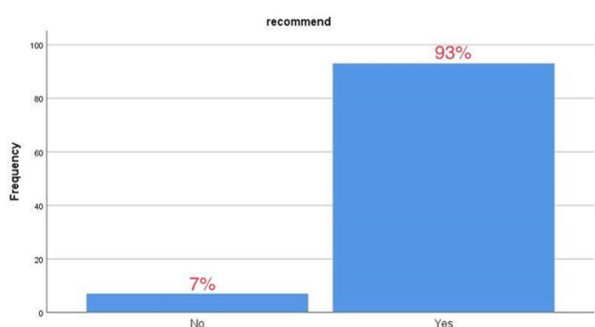


Figure 11: The frequency of response indicating the distribution of patients recommending clear aligner therapy for their friends and family

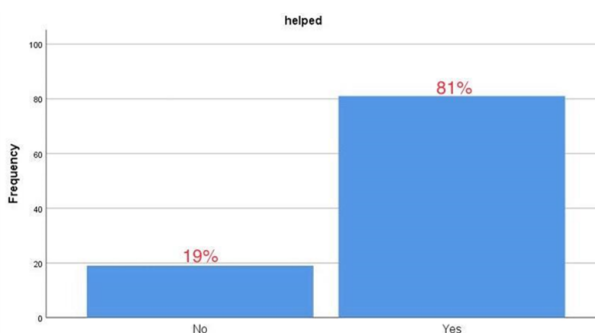


Figure 12: The frequency of response on the usefulness of this survey among patients

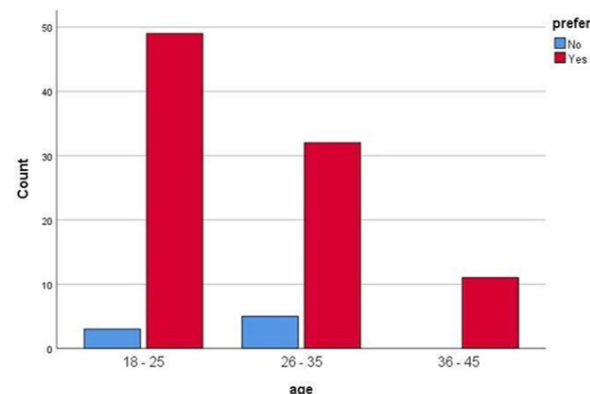


Figure 13: The association between age distribution and patients preference on opting clear aligners

participants, 52% of the population lie between 18-25 years, 37% belong to the age group 26-35 years and the remaining 11% of the population falls under 36-45 years of age (Figure 3). A majority of 53% of people said they were satisfied with their smile profile compared to the 47% of people who were not satisfied with their smile (Figure 4). A majority of 85% of patients preferred going for a more comfortable treatment option than undergoing the traditional orthodontic treatment, whereas a minority of 15% of people did not opt for it (Figure 5). 51% of the population were aware of the term clear aligner and 49% of the population are not aware of the term (Figure 6). 46% of the population knew that clear aligner is invisible aligners that are introduced in dentistry as modern treatment options, whereas 54% of the patients were not aware of it (Figure 7). A majority of 89% of people were concerned about the high price of this treatment and 11% of the population were not concerned about the high price (Figure 8). 48% of the population stated that they would pay an increased pay for undergoing clear aligner therapy and the remaining 52% did not prefer paying an increased fee (Figure 9). 92% said they would prefer a clear aligner therapy as orthodontic treatment, whereas the remaining 8% of the population said they wouldn't opt for it (Figure 10). 93% said they would recommend this treatment modality and 7% said they would not recommend this (Figure 11). This survey has helped 81% of the survey population, whereas 19% stated it did not help them (Figure 12). Chi square statistical correlation between age group and patients preference on opting clear aligners shows 49% of people in 18-25 years, 32% of patients aged between 26-35 years and 11% patients aged 36-45 years preferred clear aligners. 3% from 18-25 years and 3% of patients aged 26-35 years did not prefer opting it (Figure 13).

Table 1: Association between age distribution and preference of clear aligner therapy

Age group	Percentage
18-25 years	49%
26-35 years	32%
36-45 years	11%

Table 1 represents the correlation between the age distribution and percentage of the population preferring clear aligner therapy. Pearson's Chi square value - 2.836, p value - 0.24 (>0.05), hence not significant.

Out of 100 participants, 55% were male participants and 39% were female participants. This is due to

the unequal distribution of sample size compared to the equal sample size distribution done in the previous study (Zheng *et al.*, 2017). Out of these 100 participants 52% of the population lie between the age group 18-25 years, 37% belong to the age group 26-35 years and the remaining 11% of the population falls under 36-45 years of age (Awaisi *et al.*, 2011). This is due to the geographical limitations, unequal distribution of sample size, unlike the study results indicated in previous literature (Nasr *et al.*, 2011). A majority of 53% of people said they were satisfied with their smile profile compared to the 47% of people who were not satisfied with their smile (Felicita, 2017a). This is a reason for previous orthodontic treatment and used to the profile feature (Felicita, 2018). Our study shows an increase in smile satisfaction compared to 34% of smile satisfaction among patients, as seen in the previous literature study (Vikram, 2017). A majority of 85% of patients preferred going for a more comfortable treatment option than undergoing the traditional orthodontic treatment, whereas a minority of 15% of people did not opt for it. Reason for this is an increased interest in trying out the new treatment option compared to the minority of 63% people willing to try out a new treatment option in the study cited previously (Acar *et al.*, 2014). 51% of the population was aware of the term clear aligner and 49% of the population is not aware of the term. Reason for this indicates it as a recently introduced modern treatment option, geographic limitations, advertisements, media awareness. There's a decreased positive response in our study compared to the previous study literature with an increased value of 77% (Rosvall *et al.*, 2009).

Out of the respondents, 46% of the population knew that clear aligner is invisible aligners that are introduced in dentistry as modern treatment options, whereas 54% of the patients were not aware of it. This is due to increasing media awareness and advertisements (Balachandran *et al.*, 2019). Majorities of 89% of people were concerned about the high price of this treatment and 11% of the population were not concerned about the high price. This is due to the socio economic status, difficulties in follow ups and replacement. Shows positive response compared to the previous literature with 55% willingness in previous study (Felicita, 2017b).

48% of the population stated that they would pay an increased pay for undergoing clear aligner therapy and the remaining 52% did not prefer paying an increased fee. Reasons are monitor issues, socio economic status and replacement difficulties (Ke *et al.*, 2019). 92% said they would prefer a clear aligner therapy as orthodontic treatment, whereas

the remaining 8% said they wouldn't opt for it. This result indicates anxiety, doubtfulness, monetary issues compared to 85% of our previous literature (Noor *et al.*, 2019). 93% said they would recommend this treatment modality and 7% said they would not recommend this. This indicates a positive outlook on the acceptance of clear aligner therapy among patients according to the previous literature (Ke *et al.*, 2019). This survey has helped 81% of the survey population, whereas 19% of the population stated it did not help them. This shows that awareness has been created for the desired study population showing a positive response, compared to the 67% of awareness created by the study previously done (Tamer *et al.*, 2019).

Absence of follow ups, geographical restrictions, unequal case distributions and impossibility to achieve long term study where the limitations of the study. Future scope includes larger sample size and different ethnicity giving more awareness, more preference and better results.

Clear aligner therapy is considered as one of the most preferred treatment options among patients of both developed and developing nations (Kumar and Ganapathy, 2020). Even though the patients are well aware of this treatment option, done by marketing agencies in the form of advertisement and many other modes of creating awareness, patients are concerned with factors like the high price of the treatment and doubtfulness over the success rate of clear aligner therapy (De Leyva *et al.*, 2019).

CONCLUSION

Thus from this study, it is revealed that the patients undergoing traditional fixed orthodontic therapy prefer opting for clear aligner therapy for the comfort and aesthetic perfection rendered by it. Thus we can conclude that patients undergoing orthodontic treatment have moderate knowledge and awareness on clear aligner therapy.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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