

A Retrospective Analysis Of Patients Preference To Clear Aligner Therapy Over Conventional Orthodontic Therapy

Research Article

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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 moderate understanding of clear aligners and their acceptance of it as an orthodontic treatment option.

Keywords: Aesthetics; Clear Aligner Therapy; Malocclusion; Orthodontic Treatment; Patient Preference.

Introduction

India known as the developing super power in the upcoming times, has a population that ranks second after China but the people of India are unaware of the various recent advancements in medicine and dental field [18, 19, 22]. Few people still stick to the taboo mindset saying old methodologies are effective when it comes in terms of treatment modalities [15, 13]. Like other common dental problems such as dental caries, fluorosis, gingival and periodontal diseases, malocclusion is also considered as the commonest complaint of every patient who visits a Government or a private dental practice [23, 4, 28]. Malocclusion is defined as irregularity of the teeth or a malrelationship of the dental arches beyond the range of what is accepted as normal occlusion [33]. Maloccluded teeth can cause psychological problems that are re-

lated to impaired dentofacial esthetics [12, 27] Malocclusion may also cause serious problems related to the oral health. This is a multifactorial defect caused by factors such as environment, lifestyle, health, genetics, socio-economic status etc [24].

Clear aligners are orthodontic therapeutic options which are preferred for the correction of maloccluded teeth. 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. 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. [19, 3, 9]. Clear aligners are invisible orthodontic appliances that

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help in correction of teeth. They perform similar functions of that of a traditional fixed appliance but appear to be clear / invisible in nature. They are used for correcting moderate discrepancies in occlusion and for patients who have relapse in their treatment. Clear aligners are not suitable for treatment of severe maloccluded teeth. 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 a conventional orthodontic therapy. 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.

Oral health knowledge is considered as an essential prerequisite for a healthy lifestyle [32]. The need and demand for an orthodontic treatment varies based upon social and cultural conditions. [8, 26, 29, 16] 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.

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 that was uploaded in Google forms and circulated among the patients. To eliminate bias, a randomized sampling method was used. The data was collected over a period of one week. The survey consists of 11 close ended questions. 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. 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.

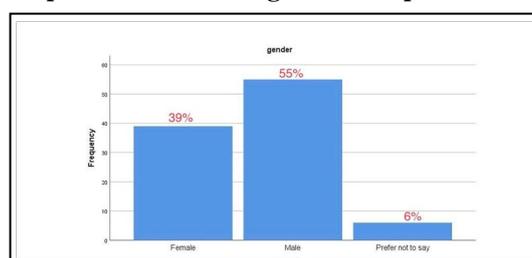
Results and Discussion

A total of 100 patients were involved in this study. Out of which 55% were male participants and 39% were female participants and remaining 6% didn't prefer to reveal their gender (graph 1). 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 (graph 2). A majority of 53% of people said that they were satisfied with their smile profile compared to the 47% of people who were not satisfied with their smile (graph 3). A majority of 85% of patients preferred going for a more comfortable treatment option than undergoing the traditional orthodontic treatment where as a minority of 15% of people did not opt for it (graph 4). 51% of the population were aware of the term clear aligner and 49% of the population are not aware of the term (graph 5). 46% of the population knew that clear aligners are invisible aligners that are introduced in dentistry as modern treatment options where as 54% of the patients were not aware of it (graph 6). A majority of 89% of people were concerned about the high price of this treatment and the 11% of the population were not concerned about the high price (graph 7). 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 (graph 8). 92% of the population said they would prefer a clear aligner therapy as an orthodontic treatment whereas the remaining 8% of the population said they won't opt for it (graph 9). 93% of the people said they will recommend this

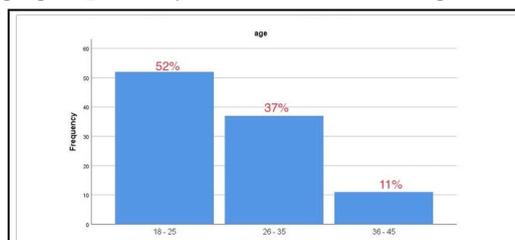
Figure1. Frontal view of clear aligners in the upper and lower arch.



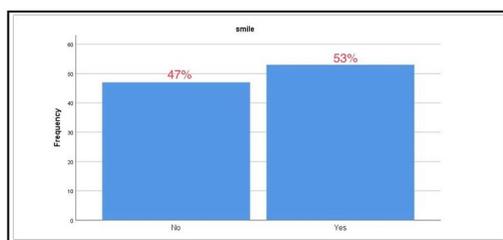
Graph 1. Bar graph indicating the frequency of distribution of gender population. 55% were male participants and 39% were female participants and remaining 6% didn't prefer to reveal their gender.



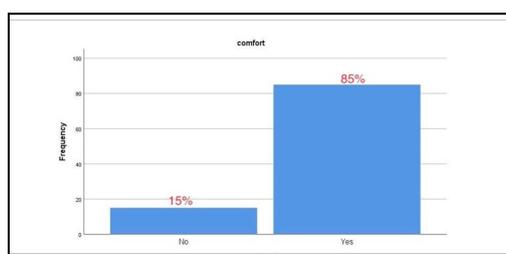
Graph 2. Bar graph indicating the frequency of distribution between age groups. 52% of the population lie between the age group 18-25 years, 37% belong to the age group 26-35 years and the remaining 11% of the population falls under 36-45 years.



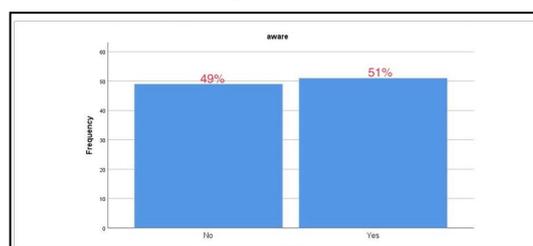
Graph 3. Bar graph indicating the frequency of responses on smile satisfaction among patients. 53% of people were satisfied with their smile profile and 47% of people were not satisfied with their smile.



Graph 4. Bar graph indicating the frequency of response on patients preference over comfortable treatment option than conventional orthodontic treatment. 85% of patients preferred going for a more comfortable treatment option than undergoing the traditional orthodontic treatment where as a minority of 15% of people did not opt for it.



Graph 5. Bar graph indicating the frequency of response on distribution over awareness of the term “clear aligners”. 51% of the population were aware of the term clear aligner and 49% of the population are not aware of the term.

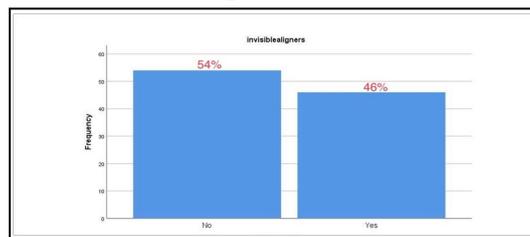


treatment modality and 7% said they would not recommend this (graph 10). This survey has helped 81% of the survey population whereas 19% of the population stated it did not help them (graph 11). Chi square statistical correlation between age group and patients preference on opting clear aligners shows 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.(graph 12).

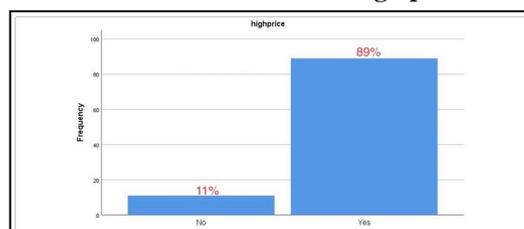
Out of 100 participants, 55% were male participants and 39% were female participants. This is due to the unequal distribution of sample size compared to the equal sample size distribution done in previous study [34] Out of these 100 participants 52% of the population lie between the age group 18-25 years, 37% belong to the age group 26-35 years and the remaining 11% of the population falls under 36-45 years of age. This is due to the geo-

graphical limitations, unequal distribution of sample size unlike the study results indicated in previous literature [20, 10]. A majority of 53% of people said that they were satisfied with their smile profile compared to the 47% of people who were not satisfied with their smile. This is a reason for previous orthodontic treatment and used to the profile feature. Our study shows an increase in smile satisfaction compared to the 34% of smile satisfaction among patients as seen in the previous literature study [31, 7]. 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 [1]. 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,

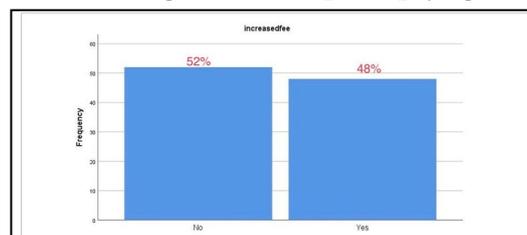
Graph 6. Bar graph indicating the frequency of response on distribution of clear aligners as invisible therapy. 46% of the population knew that clear aligners are invisible aligners that are introduced in dentistry as modern treatment options where as 54% of the patients were not aware of it.



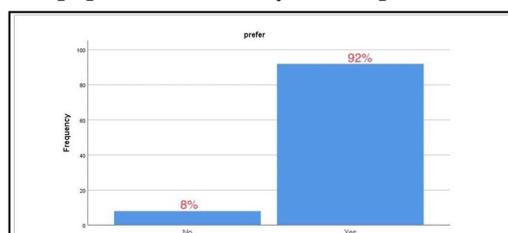
Graph 7. Bar graph indicating the frequency of response on distribution of patients' concern over the high price of orthodontic treatment. 89% of people were concerned about the high price of this treatment and the 11% of the population were not concerned about the high price.



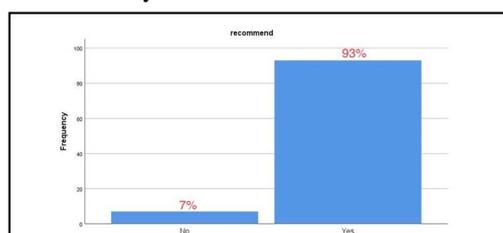
Graph 8. Bar graph indicating the frequency of response on distribution of patients willingness to pay an increased fee for orthodontic treatment. 48% of the population stated that they would pay an increased pay for undergoing clear aligner therapy and the remaining 52% did not prefer paying an increased fee.



Graph 9. Bar graph indicating the frequency of response on distribution on preference of clear aligner therapy. 92% of the population said they would prefer a clear aligner therapy as an orthodontic treatment whereas the remaining 8% of the population said they won't opt for it.



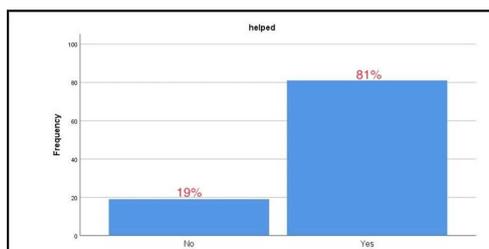
Graph 10. Bar graph indicating the frequency of response indicating the distribution of patients recommending clear aligner therapy for their friends and family. 93% of the people said they will recommend this treatment modality and 7% said they would not recommend this.



geographic limitations, advertisements, media awareness. There's an decreased positive response in our study compared to the previous study literature with an increased value of 77% [25, 19].

Out of the respondents, 46% of the population knew that clear aligners are 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

Graph 11. Bar graph indicating the frequency of response on usefulness of this survey among patients. This survey has helped 81% of the survey population where as 19% of the population stated it did not help them.



Graph 12. Bar graph indicating the association between age distribution and patients preference on opting clear aligners. 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. X axis represents age group and Y axis represents the frequency of preferred responses. (Chi square value - 2.836, p value - 0.24 >0.05, hence not significant).

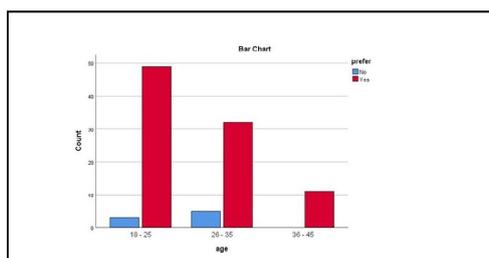


Table1. Association between age distribution and preference of clear aligner therapy.

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

advertisements [11, 2, 3, 30]. Majorities of 89% of people were concerned about the high price of this treatment and the 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 [17, 5]. 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 [14]. 92% of the population said they would prefer a clear aligner therapy as an orthodontic treatment where as the remaining 8% of the population said they wouldn't opt for it. This result indicates anxiety, doubtfulness, monetary issues compared to the 85% of our previous literature [6, 21]. 93% of the people 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 [34, 14]. 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 [1, 30].

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

ence and better results.

Clear aligner therapy is considered as one of the most preferred treatment options among patients of both developed and developing nations. 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 high price of the treatment and doubtfulness over the success rate of clear aligner therapy.

Conclusion

Thus from this study it is revealed that the patients who are 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.

References

- [1]. Acar YB, Kovan A, Ates M, Biren S. How Efficient Are Clear Aligners? Clear Aligners Vs Traditional Orthodontic treatment: A Systematic Review. Turkish J. Orthod. 2014 Sep 1;27(3):106-10.
- [2]. Awaisi ZH, Asad S, Mahmood A. Patient perception regarding impact of Orthodontic treatment. Pak Oral Dental J. 2011 Jun 30;31(1).
- [3]. Balachandran S, Ganapathy D, Ramanathan V. Clear aligners-A review. Drug invent. today. 2019 Oct 15;12(10).
- [4]. Dinesh SP, Arun AV, Sundari KK, Samantha C, Ambika K. An indigenously designed apparatus for measuring orthodontic force. J Clin Diagn Res. 2013

- Nov;7(11):2623-6.Pubmed PMID: 24392423.
- [5]. Felicita AS. Orthodontic management of a dilacerated central incisor and partially impacted canine with unilateral extraction - A case report. *Saudi Dent J*. 2017 Oct;29(4):185-193.Pubmed PMID: 29033530.
- [6]. Felicita AS. Quantification of intrusive/retraction force and moment generated during en-masse retraction of maxillary anterior teeth using mini-implants: A conceptual approach. *Dental Press J Orthod*. 2017 Sep-Oct;22(5):47-55.Pubmed PMID: 29160344.
- [7]. Felicita AS. Orthodontic extrusion of Ellis Class VIII fracture of maxillary lateral incisor - The sling shot method. *Saudi Dent J*. 2018 Jul;30(3):265-269.Pubmed PMID: 29942113.
- [8]. Felicita AS, Chandrasekar S, Shanthasundari KK. Determination of craniofacial relation among the subethnic Indian population: a modified approach - (Sagittal relation). *Indian J Dent Res*. 2012 May-Jun;23(3):305-12. Pubmed PMID: 23059564.
- [9]. Jain A, Mathew S, Prasantha GS, Sagarkar A, Shree S, Joseph A. Changing Paradigm in Orthodontics-Invisible Braces: Perception of Indian Adult Population of Clear Aligners vs. Lingual Appliance vs. Ceramic Appliance, Questionnaire Survey. *J. dent. orofac. res*. 2019;15(2):8-20.
- [10]. Jain RK, Kumar SP, Manjula WS. Comparison of intrusion effects on maxillary incisors among mini implant anchorage, j-hook headgear and utility arch. *J Clin Diagn Res*. 2014 Jul;8(7):ZC21-4.Pubmed PMID: 25177631.
- [11]. Jung MH. Current trends in orthodontic patients in private orthodontic clinics. *Korean J Orthod*. 2009;39(1):36-42.
- [12]. Kamisetty SK, Verma JK, Arun, Sundari S, Chandrasekhar S, Kumar A. SBS vs Inhouse Recycling Methods-An Invitro Evaluation. *J Clin Diagn Res*. 2015 Sep;9(9):ZC04-8.Pubmed PMID: 26501002.
- [13]. Kenealy P, Frude N, Shaw W. An evaluation of the psychological and social effects of malocclusion: some implications for dental policy making. *Soc Sci Med*. 1989;28(6):583-91.Pubmed PMID: 2928834.
- [14]. Ke Y, Zhu Y, Zhu M. A comparison of treatment effectiveness between clear aligner and fixed appliance therapies. *BMC Oral Health*. 2019 Dec;19(1):1-0.
- [15]. Krishnan S, Pandian S, Kumar S A. Effect of bisphosphonates on orthodontic tooth movement-an update. *J Clin Diagn Res*. 2015 Apr;9(4):ZE01-5. Pubmed PMID: 26023659.
- [16]. Kumar MD, Ganapathy D. Awareness about orthodontic aligners among general population in Chennai, Tamil Nadu. *Drug invent. today*. 2020 Mar 15;14(3).
- [17]. Leyva, P. de ,de Leyva, P. (no date) 'Clear aligners versus fixed orthodontic appliances in surgery first orthognathic surgery'.
- [18]. Mahajan BK, Gupta MC. *Textbook of Preventive and Social Medicine*, 1995. New Delhi: Jaypee Brothers.:562.
- [19]. Mane PN, Patil SD, Kadam K, Ganiger CR, Pawar RL, Phaphe SA, et al. Evaluation of the awareness and knowledge of orthodontics and orthodontic treatment in patients visiting School of Dental Sciences, Karad. *J Oral Res Rev*. 2018 Jul 1;10(2):62.
- [20]. Nasr IH, Sayers M, Newton T. Do patient information leaflets affect patients' expectation of orthodontic treatment? A randomized controlled trial. *J. Orthod*. 2011 Dec;38(4):257-68.
- [21]. Noor S, Ganapathy D, Ramanathan V. Awareness on various restraints in preventing orthodontic treatment among the adolescent age group. *Drug invent. today*. 2019 May 15;12(5).
- [22]. Pandian KS, Krishnan S, Kumar SA. Angular photogrammetric analysis of the soft-tissue facial profile of Indian adults. *Indian J Dent Res*. 2018 Mar 1;29(2):137-143.
- [23]. Ramesh Kumar KR, Shanta Sundari KK, Venkatesan A, Chandrasekar S. Depth of resin penetration into enamel with 3 types of enamel conditioning methods: a confocal microscopic study. *Am J Orthod Dentofacial Orthop*. 2011 Oct;140(4):479-85.Pubmed PMID: 21967934.
- [24]. Robertson L, Kaur H, Fagundes NC, Romanyk D, Major P, Flores Mir C. Effectiveness of clear aligner therapy for orthodontic treatment: A systematic review. *Orthod Craniofac Res*. 2020 May;23(2):133-42.
- [25]. Rosvall MD, Fields HW, Ziuchkovski J, Rosenstiel SF, Johnston WM. Attractiveness, acceptability, and value of orthodontic appliances. *Am J Orthod Dentofacial Orthop*. 2009 Mar 1;135(3):276.e1-12.
- [26]. Rubika J, Sumathi Felicita A, Sivambiga V. Gonial angle as an indicator for the prediction of growth pattern. *World J. Dent*. 2015;6(3):161-3.
- [27]. Samantha C, Sundari S, Chandrasekhar S, Sivamurthy G, Dinesh S. Comparative evaluation of two Bis-GMA based orthodontic bonding adhesives-A randomized clinical trial. *J Clin Diagn Res*. 2017 Apr;11(4):ZC40-ZC44.
- [28]. Singh P. Adult orthodontic patients in primary care and their motivation for seeking treatment. *Orthodontic Update*. 2016 Apr 2;9(2):69-72.
- [29]. Sivamurthy G, Sundari S. Stress distribution patterns at mini-implant site during retraction and intrusion--a three-dimensional finite element study. *Prog Orthod*. 2016;17:4.Pubmed PMID: 26780464.
- [30]. Tamer İ, Öztaş E, Marşan G. Orthodontic Treatment with Clear Aligners and The Scientific Reality Behind Their Marketing: A Literature Review. *Turk J Orthod*. 2019 Dec 1;32(4):241-246.Pubmed PMID: 32110470.
- [31]. Vikram NR, Prabhakar R, Kumar SA, Karthikeyan MK, Saravanan R. Ball Headed Mini Implant. *J Clin Diagn Res*. 2017 Jan;11(1):ZL02-ZL03.
- [32]. Viswanath A, Ramamurthy J, Dinesh SP, Srinivas A. Obstructive sleep apnea: awakening the hidden truth. *Niger J Clin Pract*. 2015 Jan-Feb;18(1):1-7. Pubmed PMID: 25511335.
- [33]. WaltherDP. 'Walther and Houston's orthodontic notes'. John Wright.1994.
- [34]. Zheng M, Liu R, Ni Z, Yu Z. Efficiency, effectiveness and treatment stability of clear aligners: A systematic review and meta-analysis. *Orthod Craniofac Res*. 2017 Aug;20(3):127-133.Pubmed PMID: 28547915.